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Contents

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THE NEW MATERIALISM.

DICTATORIAL
SCIENTIFIC UTTERANCES
AND THE
DECLINE OF THOUGHT.

BY
LIONEL S. BEALE, F.R.S.

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Dictatorial
Scientific Utterances
and the
Decline of Thought.

BY

LIONEL S. BEALE, F.R.S.

THE inquiry whether the hypotheses upon which modern scientific opinion in favour of some form of the physical doctrine of life which constitute the basis of every kind of materialism are or are not worthy of acceptance at this time, has called forth very different replies. Some in authority have answered with a positive and unhesitating affirmative, others have given an uncertain assent, or have contented themselves by not dissenting. A very small number have objected to the physical view of life as untenable in the present state of scientific knowledge, and as being, upon various grounds, unworthy of acceptance. In this minority I still find myself, because, notwithstanding full inquiry, and very careful examination

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concerning conclusions arrived at by others, I am obliged to confess that I feel more strongly convinced than ever, that all the physical doctrines of life yet advanced are quite untenable. Some of the reasons which have led me to draw this conclusion shall be set forth in this paper, while many more have been already given in works and memoirs which have been written by me during the last twenty years. The general conclusion which, as it seems to me, a careful and candid examination of the facts which bear upon the question compels an unbiassed thinker to draw, is that no form of the hypothesis which attributes the phenomena of the living world to mere matter and its properties has been, or can be, justified by reason.

Unlearned people have been flattered by having been, as it were, taken into the confidence of certain authorities of materialistic tendencies, and assured that, as science is but educated common-sense, they are well able to judge concerning many deep, scientific questions of consummate interest to every person of intelligence, and that, therefore, they will feel convinced of the truth of recent conjectures on the physical nature of life. Materialistic doctrines have now been taught for so many years that they have come to be looked upon as a sort of belief, or faith, which ought to be at once accepted by all who desire to be considered, from the materialistic point of view, as reasonable persons. Any who should be so rash as to inquire concerning the exact meaning of the terms employed, would be, of course, altogether beneath notice, as they would prove, by the doubt they implied, that they belonged to that large group of unteachable persons not included among the wise, the learned, or the cultured.

Instead of the hypothetical suggestions in favour of the physical doctrine of life, advocated by materialists and others, resulting from a legitimate flight, or extension, of the imagination into the border-land which lies between the extreme limit of observation and experiment, and that region which gradually passes into the Unknown and Unknowable, it will, I think, be found that they are almost entirely sustained by mere assertion, and by authoritative declaration, while careful study will convince that they are not sanctioned by the facts, observations, and reasonings, which constitute the science and philosophy of the time in which we live.

Positive conclusions have been drawn concerning questions of momentous consequence not only to curious and scientific people, but to mankind at large, and have been advocated with a confidence which precludes doubt, and reiterated with a pertinacity, which is calculated almost to enforce acceptance.

But few of those, who are carried along by the materialistic stream, have troubled to think over the remarkable tenets to which they have given their assent. They receive with a faith, called robust, which seems so blind and unreasoning as to border on credulity, dogmatic and dictatorial conjectures of the most extravagant kind, convinced, but not by reason, that the authors of them could not be mistaken in the views they advanced with such positive and undoubting emphasis.

The reception of materialistic dogmas by any intelligent person who takes the trouble to think over their terms, and is capable of appreciating, and analysing, and examining the evidence upon which they are supposed to rest, is simply impossible; and the applause with which these views have been received in some quarters is to be accounted for by the decline of thought, and the indisposition on the part of the public to trouble to think at all on the merits of the arguments presented to them. Is there one acquainted with the powers and actions, and results of living, of any form of living matter, who will declare that he believes the doctrine that non-living matter alone is the source of all life, and will state the grounds of his belief?

Bear in mind that no state of matter known, no mere chemical combinations, no mechanical contrivances, no machinery ever made, can be caused to exhibit phenomena resembling in any really essential particular those which are characteristic of every form of living matter that exists in nature, and which, we must infer, have characterised every particle that has ever existed since the first appearance of primitive life on the earth.

Neither can any known form or mode of ordinary energy construct or form, direct, control, or regulate. Nevertheless, it is taught far and wide that vital actions are due to the energy which belongs to ordinary matter, and that, therefore, vital action is but a modified form of ordinary physical or physico-chemical action. Vital action, it is said, differs in degree only from actions which occur in the non-living world.

As regards the nature of that remarkable process of growth which takes place in all things living we find great diversity of opinion. Some, indeed, maintain that growth is not a vital process at all, but that it essentially consists of the aggregation of particles of matter; nevertheless, no one who regards growth as a physical operation has appealed to any definite case of growth to show that the intimate changes which occur are really of the character he asserts. The growth of a leaf, for example, seems to be very widely removed from the mere aggregation of particles of matter.

In all growth we have a process essential and peculiar to all life, which is confined exclusively to the living, which does not characterise any form of non-living matter whatever. But *growth* is but one of several vital phenomena absent in all non-living, present in every kind of living. It has been asserted, and is now ordinarily taught, that crystals *grow*. Between the so-called growth of a crystal and the actual growth of a particle of living matter there is, however, no true analogy.

Herbert Spencer, strange as it may seem, affirms that crystals *grow*, and that non-crystalline masses of various kinds *grow*. He declares that the accumulation of carbon on the wick of an unsnuffed candle is an example of *growth*. On the other hand, he states that the living shoots from a growing potato are not an example of growth. Now I desire to direct your attention to this part of Herbert Spencer's work because he endeavours to convince his readers of "the essential community of nature between organic growth and inorganic growth." There, will be found some of the very remarkable inferences upon which his system of evolution in part rests, and which may be clearly proved to be erroneous. Indeed, not a few of the assertions he makes may be answered by a direct contradiction, with advantage to the cause of truth. Non-living things do not *grow*, as he affirms, while all living things and every form of living material *does grow*, although, he says, with respect to a living plant that its increase is not *growth*. The case of the potato, which he affirms not to be *growth*, is really as good an instance of growth as can be obtained in nature. Now, if I can persuade any disciple of Herbert Spencer to explain and defend his utterances in the first two pages of this chapter of part II. on the "Inductions of Biology," I think much advantage would result. A careful examination of this chapter will enable any intelligent person to see how the idea of community of nature sought to be established between the living and the non-living is defended by this author. The so-called *growth* of the non-living masses differs absolutely from the only true *growth* which is peculiar to the living world, but universal in it. Now vital growth has never been explained to this day, and cannot be explained on chemical or mechanical principles, or imitated in the laboratory. The *growth* of the most minute particle of living matter is, as I have stated, a vital process, and is due to the operation of a force or power absolutely distinct from ordinary energy and from every form of force of non-living matter. Every kind of aggregation is absolutely distinct from growth, and does not involve the

latter. Processes of aggregation may go on to all eternity without the occurrence of any change resembling, or allied to, that of growth. *Growth* after all is but one of several purely vital phenomena.

Surely it is the duty of all persons having any pretensions to culture, who esteem accuracy and truth, and desire to promote their diffusion, either to condemn the materialistic doctrine as scientifically untenable, or to insist that more accurate and adequate explanation of the facts and principles upon which it is based should be given by those who have unreservedly committed themselves to the universal application of this physical hypothesis of life, and that some reply should be made to the objections that have been raised to its general application to living things.

I would draw attention to the declaration again and again repeated, and now taught even to children, *that the living and the non-living differ only in degree, that the living has been evolved by degrees from the non-living*, and that the latter passes by gradations towards the former state. No one has adduced any evidence in proof of these conclusions which are, in fact, dictatorial assertions only, and no specimen of any kind of matter which is actually passing from the non-living to the living state, or which can be shown to establish any connexion between these absolutely different conditions of matter has been, or can be at this time, brought forward.

You will, I think, find that, in endeavouring to prove the reasonableness and strength of the doctrines they have espoused, the advocates of every form of materialism mainly rely upon the assumed applicability to matter that lives, of conclusions arrived at concerning the nature of the phenomena of non-living matter. But the fact, That this living matter, as is well known, is invariably derived from matter that already lived, is a serious difficulty which presents itself to the mind at the outset of the inquiry, and which, instead of receiving some explanation as regards its bearing upon physical views of life, is on account of its inconvenient tendency generally ignored. Materialism, indeed, rests upon this assumed intimate alliance and relationship between the living and non-living. But as soon as the knowledge of the peculiar and special nature of all vital actions shall be better known and more widely spread, and when people shall have learnt how absolutely the vital are marked off from purely physical and chemical actions, belief in materialism will be shaken, and this antiquated creed will then only retain the support of a few faithful adherents wedded to the old paths and ancient ways who have not heart to desert the old beliefs, evolved in the infancy of thought and

philosophical inquiry. Were their reason allowed to do so, it would probably lead them towards a goal of a very different nature. It is, indeed, strange that one of the chief means relied upon for the purpose of convincing people of the truth of materialism should be to institute comparisons between things which are alive and have gradually grown—from the infinitesimal, transparent, structureless—into form and bulk, and lifeless machines which have been made in pieces and afterwards put together; and to assure the public that these two utterly distinct things, living beings and machines—nay, machines made by man, and not capable of being produced in any other way—were very much alike, and belonged to the same category. It would be tedious were I to repeat the dictatorial utterances in argumentative form which have been published far and wide for the purpose of leading people to believe that a living thing was like a watch, or a steam-engine, or a hydraulic apparatus. Moreover, some of the comparisons have been voluntarily abandoned by their authors in favour of others even more absurd. Such tricks as calling a watch a *creature*, and a man a *machine*, are hardly likely to mislead even the most ignorant after they have withdrawn themselves from the bewitching influence of the persuasive eloquence of the materialist prophet, and have commenced to calmly think over his extraordinary utterances, in order to extract any meaning that may be hidden by the frothy metaphors of modern physico-vital conjecture.

The very last comparison made for the purpose of helping people to understand the nature of a living thing, is, I think you will say, the very worst and most inappropriate ever suggested—one that, as you will perceive, must be rejected, not only because it is quite inapplicable, but because the thing with which a living being is compared is so distorted and so changed that it is no longer what it has been called—nay, in the terms adopted it is not even conceivable by the imagination. This last thing which it has been said a living body is like is called an army, but, as I shall show you, some essential characteristics of an army have been taken away, and some impossible characteristics arbitrarily added, which would reduce a hypothetical army to that which could no longer be correctly termed an army; and as some of the characters super-added are absolute impossibilities of nature, the whole comparison comes to little more than incongruous, unintelligible metaphor, or incoherent rhapsody, which may amuse the fanciful and thoughtless, but which ought to be condemned by all capable of thinking, as extravagant and misleading, and as likely to hasten the decadence of thought.

Let me beg of you not to allow the mind to be diverted by fanciful comparisons and asserted resemblances of the living to the non-living, from the careful consideration of the real differences between that which is alive and that which is not alive. This question of difference or resemblance between vital and physical will be found to underlie some of the most important speculations of our time, and I cannot too earnestly draw your attention to the very great importance of insisting that the facts and arguments advanced by materialists should be clearly stated so that they may be thoroughly sifted, and fairly discussed, instead of vague assertions in favour of wide generalisations being accepted without examination or inquiry. If examined not a few of the conclusions will, I am sure, be dissipated at once, for they will not stand the test of careful analytical exposition.

It is not to the credit of the science, or the philosophy, or even the common-sense of our day, that broad and far-reaching doctrines of the kind alluded to, and which involve inferences of transcendent consequence concerning the present, past, and future of all things, should be accepted without examination, taught far and wide even to babes, and presented in a clever and inviting guise, and made to appear as if they were actual and generally received truths, to be accepted by all who wish to be considered to be progressing with the times, while in reality the doctrines in question are mere conjectural opinions founded on vague and insufficient data, with nothing whatever to recommend them save authoritative assertion. Such doctrines would have little chance were it not for love of extravagant novelty, and the decline of thought.

It must, I think, be admitted that in science, as well as in some other departments of human endeavour, there is at this time far less freedom of thought as well as of discussion than is necessary for intellectual progress. Real advance is in these days too often thwarted by cliques and caucuses whose chief business it seems to be to manufacture "public opinion," to create "tendencies of thought," and thus prevent, or render nugatory, the intelligent examination and criticism of the doctrines established and spread. Besides this, the prejudices of the unlearned are sometimes flattered, and the applause and indolent acquiescence of mere numbers eagerly sought for. Many of those who support materialistic doctrines, are too lazy to think over the principles upon which the doctrines they are persuaded to accept are based, nor are they able to estimate the consequences which the general adoption of such speculations would involve. The exercise of a sort of terrorism has led to people being frightened into a sort of confession

of faith in some absurd dogmas, the threatened penalty for refusal being that of being numbered amongst the fools, the bigots, the orthodox, and the like.

Some who accept fancies of the most conjectural character as new articles of belief, which involve the abandonment of old truths as well as the sacrifice of firm bulwarks of belief, seem to reluctantly yield a regretful, but conscientious submission to the stern dictates of truth, and pose as if they were exercising a self-denying virtue, possibly not unalloyed with pity, nor quite free from contempt for those who still hopefully cling to the beliefs of their fathers. Nevertheless, if you will take the trouble to thoroughly investigate the principles of the new faith, you will be convinced that all that can be obtained by the most careful analytical examination of the foundations upon which different forms of new materialism rest, are dogmas about forces and properties, hypotheses as to what may be, or might be, or must be, and a robust faith, which you are requested to have, in wonderful discoveries which are to be made after the lapse of some time by privileged spirits who, it is asserted, will make their appearance in the future.

That a materialistic and antitheistic view of things may present itself to some minds, and assume what seems to be a reasonable form is, however, possible; but the pretentious vapourings in philosophical phraseology familiar to us, and which are supposed to tend towards that by not a few much-to-be-desired consummation, are often but a poor parody on materialism, and a real disgrace to the critical and reasoning power of our time. Some of the assertions which have been made about the properties and potencies of matter, and which are repeated even in text-books, would not survive candid answers to the questionings of a curious schoolboy.

The popular scientific doctrines of the last few years all seem to admit some vague, imaginary, non-existing first cause, of which neither the nature nor the attributes have been defined, and which is placed at such a remote distance in time from the present era, that in us it can hardly excite more interest than the possibility of a shadowy phantom in an all-pervading primitive mist. There seems to be a fanciful conception of material atoms being evolved from the void; but it is, of course, useless to ask why, when, or how? By one supreme mysterious fiat, or effort, beyond, above, and independent of all law, eternal forces and properties were conferred upon these atoms, I suppose, at the moment of their evolution from the nothing, by virtue of which they restlessly gyrate. The vibrations communicated to atoms by the first impulse then

came under law, and in obedience to laws supposed to have been enacted in the first beginning, still continue their movements, and being acted upon by, and acting upon other atoms, actions of the most complex character are established. Gradually these actions are supposed to take the form of life, and as the ages have rolled on, living forms have assumed a higher character until, at last, the evolution of man himself was consummated. Of all things the farthest removed from the remote cause of his existence, man, the only being in nature longing to know of law, of cause, of consequence, is commanded to see grandeur, and more than grandeur in the fanciful suggestion of a creator of molecules of cosmic vapour out of which earth and air and water, and every form of matter, non-living and living, were, according to the hypothesis, gradually formed, or evolved themselves in obedience to some compulsory arrangement, or not to be accurately defined necessity, or "law," supposed to have been enacted for once and for all by the Creator in the first beginning, and still causing everything and operating on everything up to this very day.

The materialist needlessly, and without reason—or, rather, against reason, as it appears to many—sneers at the want of enlightenment of past generations, and in his own dogmatic and self-confident, infallible way expounds the materialistic views of the existing order of things; extols the tendencies of what he calls the thought of his time, by which he seems to mean materialistic dogma, and prophecies concerning the proofs of the truth of his teachings which are to be discovered by unborn materialistic investigators. His hearers listen with wrapt and unquestioning reverence to his vague and extravagant utterances. They cannot doubt; they dare not think. Have not gifted mechanisms of the highest culture spoken? have not privileged spirits of transcendent power prophesied? Who, then, fit to survive, can doubt—who dares to disparage the glorious grandeur of the universal, ever-moving molecular mechanism?

How often are we enjoined with austere solemnity not to resist the influence of the cold logic of materialistic science? We shall be spurned by many, but we must be encouraged by the conviction that we are acquiring material truth, and sustained by the consolation that, though we may be looked down upon, we may feel certain that we alone are right. We are not only told how we must look at nature, but precisely what we are to see is most accurately described, exactly as it has been discerned by the materialistic intellect and caused to assume a form fit to be received by the people at large. The moving forces and molecular mechanisms have been revealed.

Nature herself has been discovered. And a very pretty nature, indeed, is the materialistic nature which has been embodied by authority, and held up for the contemplation and admiration of mankind. Instead of the benign nature of the Epicurean, which gave to all, which made all, and which provided for all, we have a benighted nature in the shape of a blind, insatiable, relentless, irresistible fate, falsely called law—working like a dull, senseless machine of overwhelming might, maiming, crushing, distorting, destroying, and thus continuing and preserving,—destitute of intelligence and reason,—devoid of justice and mercy. A nature not contributing to the happiness or enjoyment of any, working upon a world peopled with machines and continued by the destruction of the products of ever-recurring, ever-failing, unintelligent, undesigned experiment. A nature whose law is in part worked out by length and strength of tooth and claw ; a nature which must be detested by the good, and despised by all who can think, and see, and reason. Such is the natural world which is held up for our admiration with the consoling assurance of dictatorial authority that it sprang from chaos in obedience to everlasting self-originating (?) law, and that it will return to chaos, in obedience to the same,—all life and work and thought being but the undulations of cosmic nebulousity, and dependent upon the never-ceasing gyrations of infinite, everlasting atoms, as they bound through the ages from void to void.

This, the dullest, the narrowest, the most superficial of all creeds—materialism, which includes some mixture of anti-theism and atheism of various forms and hues—has been half accepted by hundreds of persons during the last few years. I believe all materialistic doctrines, vary as they may in detail, will be found to agree in accepting as a truth—if, indeed, they are not actually based on it—the monstrous assumption that the living and the non-living are one, and that every living thing is just as much a machine as a watch, or a windmill, or a hydraulic apparatus.

According to the material contention, everything owes its existence to the properties of the material particles out of which it is constructed. But is it not strange that it never seems to have occurred to the materialistic devotee that neither the watch, nor the steam-engine, nor the windmill, nor the hydraulic apparatus, nor any other machine known to, or made by, any individual in this world, is dependant for its construction upon the properties of the material particles of the matter out of which its several parts have been constructed ? Who would think of asserting that in the properties of brass and

iron or steel we shall find the explanation of the construction of a watch? It has been often affirmed in positive and dictatorial language that the formation of the animal is due to the properties of the particles of which its body is composed.

There can be no doubt that of late years there has been an intense desire on the part of many people to be assured that there was no absolute or essential difference between the changes taking place in living things and in non-living matter, and this idea is supposed to add grandeur to the conception of the unity of universality. The desire has been abundantly gratified. The assertion has been made again and again, and it is being continually repeated and emphasised, but, strange to say, some incredulous sceptics doubt whether, after all, the assertion is literally true. They listen, they admire, they repeat; they even try to persuade themselves and others that the assertion is true, but still they doubt. Many, though they are assured of the analogy between hammered iron giving out heat and the brain, sensation, are not quite convinced. The too frequent repetition of a scientific statement seems to beget doubt in sceptical minds concerning its accuracy. If, as it should do, the doubt excites a determination to carefully examine the foundation upon which the doctrine of the identity of physical and vital phenomena rests, the conviction of the utterly untenable character of the hypothesis will be forced upon the mind of the inquirer, who will afterwards be on the side of the opponents of the faith in the unity of non-living and living.

Many persons of intelligence cannot but admire materialistic unity, and are anxious to be convinced that the non-living and living are really one, and that the phenomena of the living world are due to the properties of matter as much as are those of the non-living world. The simplicity of the idea is convincing. Persons of this persuasion do, in fact, accept materialism in faith, but, above all things, they desire that their doubting faith should be fortified by robust reason. The desire has not been gratified, and, in fact, not a few are troubled by doubt. Those who think over the matter do not wholly believe, though they wish they could believe that they are mere machines. They cannot call to mind any machine which grows as they have grown, while all the machines they know anything about have been made in pieces, which have been put together afterwards.

When people begin to think they will soon see how absurd it is to maintain that growth and the actions going on in living beings are due to the properties of the particles of matter of which their bodies are composed. A little reflection will make

it obvious enough that neither the formation nor the action of the watch, or the steam-engine, or the windmill can be due to the properties of the matter of which the machine is made, but that formation and action depend upon the manner in which the parts are fashioned and put together and made to work. And, of course, the suggestion will occur to those who think that if all these machines were to be destroyed and pounded to pieces, the matter would still retain its material properties, although no one could then discover that it had ever taken the form of a watch, or an engine, or a windmill, any more than a chemist from a thorough examination of the mere matter and its properties would be able to premise that it would one day take the windmill, watch, or other form. But however severely faith in materialism may be shaken by thought, its admirers may take comfort in the consideration that, although to their uninformed intellects much may seem doubtful, uncertain, and strange, the high priests of materialism could unquestionably explain all, and make everything clear, if they deemed it desirable and to the advantage of the millions to do so at this time. The final and complete materialistic revelation is to come in good time.

“Protoplasm” and “Physical basis of Life” have entered into many dictatorial utterances, and the words must by this time be familiar to every one. But if we endeavour to ascertain the exact meaning which is attached to the words, and try to make an accurate estimate of their value with regard to the new light supposed to have been thrown by their use upon the question of the nature of life and the relation of non-living to living matter, we shall find that our task is not an easy one. Protoplasm, it is said, is the physical basis of life. The moving matter in the hair of a nettle, or in a cell of vallisneria, the moving matter of the body of an *Amæba* or a white-blood corpuscle, white of egg, boiled white of egg, muscle, roasted and boiled muscle, boiled lobster, are, it has been said, composed of protoplasm and constitute the physical basis of life. Upon the molecular changes taking place in these different forms of matter, life, it has been affirmed, depends, and all of them, it is said, are composed of “molecular mechanisms.”

No one can attentively study the statements, and apply his mind to the examination of the assertions which have been made, without observing that the same name, protoplasm, is applied to matter in essentially different states. Living matter is called protoplasm; dead and boiled and roasted matter is also called protoplasm. Living matter, dead matter, and roasted matter are all the physical basis of life. That which is not only dead, but has been dead for a long time, is the

basis of *life*. The matter of a living thing which is alive at the time is also a "*physical basis*." That which is alive is a physical basis of life, and that which is dead is equally a physical basis of life. Such is the reply made to the question, What is the difference between living matter and the same matter which has ceased to live? Such is the method by which it is shown that the difference between the living and the non-living is not a difference in kind, but in degree only. Such is the method by which people have been misled and confused. It is, of course, mere idle trifling of the most transparent character. But few persons have taken the trouble to carefully examine the statements with the object of discovering exactly what was the meaning the author intended to convey. Many, perhaps the majority of readers, are content to catch the words, without troubling themselves to ascertain what meaning ought properly to be attached to them. Perhaps they feel much confused, and not liking even to think disrespectfully of the writer, they persuade themselves that the full consideration of the question is beyond the province as well as the capacity of busy people engaged in the ordinary work of life, and that, therefore, they must accept without inquiry the assertions, as the authoritative utterances of gifted spirits.

Such views would have little chance of being received, or even tolerated, had they not been advanced at a time which was remarkable for the decline of thought, and for the dislike or fear of examining and analysing authoritative statements.

The phrase "undifferentiated protoplasm," as contrasted with "differentiated protoplasm," is now often used. Children are asked questions about it in elementary examinations, and yet no exact meaning has been given by any one to the terms, and the sense in which the words are often used is incorrect. The "differentiation" of protoplasm is one of the cant terms of the time, and is supposed to explain a great deal, while it only deceives and confuses; for instead of differentiation being an explanation of change, or the cause of change, as is implied, it is really only a way of stating a fact. If it is correct to call the undifferentiated matter protoplasm, it cannot be correct to call the differentiated matter by the same name, because the first exhibits phenomena absolutely distinct from any manifested by the last.

Let us endeavour to keep clearly before our minds the paramount importance of the answer given by the science of our time to the question, "What is the difference between living matter and the same matter in the dead state?" If it can

be proved, as declared in many scientific dictatorial utterances, that the difference is molecular, mechanical, or chemical in its nature, then must things living be included in the same category as non-living matter. The living and non-living in that case will truly be one; then would be established the much longed-for Unity; then would materialism rest on an intelligible basis, and constitute the foundation of a popular if not a progressive creed.

But the science of our day has given no answer of the kind. On the contrary, all investigations so far carried out lead to inferences of an opposite tendency. So far from the gradations asserted to exist having been proved, not a vestige of anything tending towards proof has been discovered. No difference in kind so consummate, no divergence in property so wide or so absolute, can be pointed out in nature, as the difference which subsists between a minute particle of matter in the living and the same in the dead state. The difference remains to this day as irreconcilable, inestimable, absolute, in every sense as it ever was; while there is no reason to suppose the difference will be less in time to come.

Now, let me ask you to consider for a moment the movements which affect every form of living matter while it is alive, which cease with its death never to recur, and which are absolutely different from any movements of non-living matter which are known. In many instances so active are these movements that they can be seen and studied under the microscope by any one who chooses to take a little trouble. Although the observer may not be a trained microscopist, he will see enough to satisfy him that the movements are not like those of any ordinary matter. It is true that movement occurs in all kinds of matter non-living as well as living, but the movements of the molecules of non-living matter are one thing, those of living matter another thing altogether. The former belong to matter as matter, and occur in the particles whether alive or dead. The latter continue only as long as life lasts. It has been authoritatively declared that living movements differ from non-living movements in degree only, and not in kind. But any one who studies the movements of living matter soon becomes convinced that they are different in kind from any non-living movements, inasmuch as they begin and cease under circumstances which would not affect the movements of non-living matter, while the very matter which exhibits the living movements will exhibit non-living movements after it has ceased to live. The materialistic doctrine of life, instead of resting upon facts of observation and experiment, rests upon assumptions of the most extravagant

kind, and the facts of nature are too often distorted and made to bend to the requirements of artificial and ridiculous creeds resting on authority only.

Thoughtful persons must be surprised that the constant repetition, without any attempt at proof, of such assertions as, that all living things are mechanisms, mere machines, and that in the living matter of their bodies there is molecular machinery—does not of itself lead to the exposure of the extreme weakness of the materialistic view. For is it reasonable to suppose that the ardent advocates of materialistic doctrine would be content with vain repetitions if they could explain and illustrate their assertions so as to make them intelligible? Would they not offer remarks concerning the *sort* of machinery they say exists? Would they not tell us how it appeared, something about its structure, the way in which it was put together, the mode in which it was dissolved and renovated, the means by which it was made to act? Would they not have something to suggest concerning the forces or powers by which the working of the machinery was directed, and the probable source of these, as well as their ultimate fate? Would they not, if they could have done so, have given diagrams of the molecular machinery of their imagination for the instruction and edification of their less learned and weaker brethren? But instead of this, all that men of this persuasion seem able to do is to repeat again and again the same monstrous assertions, That living matter and non-living matter differ only in degree, and that the action of living matter is due to molecular machinery. But besides giving to non-living matter molecular machinery, the capacities and powers which the living alone possesses are sometimes given to the molecules of inorganic matter. Professor Huxley, for example, goes so far as to affirm that these inorganic molecules have the power of “sensitively adjusting themselves.” Indeed, one would not be surprised if it were discovered that certain molecules which had acquired advantages over others, arranged themselves in such positions as would enable them most successfully to jostle weaker molecules and take the places they were the fittest to occupy.

That such vague notions should be accepted by any but a few enthusiasts who knew nothing of the facts would be surprising; but that such very imperfectly considered conclusions should be accepted by many and become really popular, indicates that there is somehow a demand for them—a desire or determination on the part of people to receive them—a longing to believe them, and a conviction that they will be proved to be true—a determination to rely upon mere authoritative

declarations, and to have their thinking done for them instead of thinking for themselves. Such are some of the indications of a decline of thought.

The public are now-a-days assured that the phenomena of the living world are due, not to *life*, but to the molecular constitution of the matter of which the bodies of living things are composed. Ere long, however, people will find that little consolation, or information, is to be gained from the molecular constitutions that may be, and then they will perhaps be content to be brought face to face with the facts as they are, and will see that the conclusion, That matter became endowed with vital power *after, and perhaps very, very long after it had acquired its molecular constitution*, is more in accordance with the facts of nature than the assumption, That all living forms are due to non-living properties, and that no powers whatever have been communicated to matter and no direct metabolic influence exerted, since its first creation.

It is not now easy to get a hearing for arguments in favour of views concerning the nature and action of living things which in any way conflict with what happens to be the current opinion of the time. The educated public has much to answer for as regards the unmeasured support it has for years past given to speculative thought of a most one-sided character, as well as for the tyranny it has permitted and encouraged, and still allows to be exercised towards any who put forward conclusions which happen to be opposed to the fashionable dogmas of the day.

Can applause or great popularity afford any excuse for the unfair way in which many popular authorities have put the question of vital actions in living things before their hearers. The alternative view is almost invariably represented as an absurdity, or a perverse misrepresentation of the facts. The extent to which mere intellectual trickery is carried in these days is marvellous; but so few people think over what is affirmed by teachers very popular at the time, that the most astounding absurdities receive a sort of acquiescence, and long escape the exposure they deserve. Those who differ from materialists are credited with believing in all sorts of nonsense, and are said to stand upon the ancient ways, while, in point of fact, these professors of materialism—in their style, in their method of procedure, in what they teach as new—are truly most antiquated, for they are really trying to make the world go back more than two thousand years, in order that it may gain the inestimable advantage of reverting to a faith compared with which Mahometanism is advanced, indeed.

In his address to the medical congress, Professor Huxley

tells the assembled medical and scientific men that "the simplest particle of that which men in their blindness are pleased to call 'brute matter,' is a vast aggregate of *molecular mechanisms performing complicated movements of immense rapidity and sensitivity (!) adjusting themselves* to every change in the surrounding world. Living matter differs from other matter in degree and not in kind; the microcosm repeats the macrocosm, and one chain of causation connects the nebulous original of suns and planetary systems with the protoplasmic foundation of life and organisation."

Professor Huxley has been continually propounding and putting forward conjectural utterances of the kind during the last twenty years, and it is surely now time that something more substantial should be brought forward in support of the dogmas than conjectural chains of causation. Just think over the paragraph I have read, and try to extract from it any sense it may contain. We are told that "the protoplasmic foundation of life and organisation" is connected with "the nebulous original of suns and planetary systems," by "one chain of causation." Can an individual be found who will undertake to defend or to expound these nebulous utterances? If they amuse, they will certainly delude and mislead an audience. Here is an example of what is considered good for the purpose of advancing scientific education. That talk of this kind should be deemed likely to enlighten the medical profession, or assist in any way to advance medical education, is most extraordinary.

It is not pleasant to have to differ from Professor Huxley, for not only has he a multitude of enthusiastic admirers, but he is himself a master in the use of very robust language, particularly when he deigns to refer to people who do not agree with him. Some who are unable to accept as the exact truth what he affirms to be truth, have been spoken of as bigots, and it is possible that some other epithets may yet be found, to still more decidedly characterise people who are opposed to his doctrines. Only the other day it was said that a truth which, according to Mr. Huxley, had been "trodden under foot, reviled by bigots, and ridiculed by all the world," is "only hated and feared (!) by those who would revile but dare not!" Professor Huxley likes the word "revile." To say that people who differ from you revile you, is, undoubtedly, an ingenious way of getting out of a great difficulty. When you are asked to explain what you mean by some very confident dictatorial utterance, and if you feel that you cannot do so, there is nothing like accusing your opponent of reviling.

Any evolutionist who has a question put to him which it is inconvenient to answer, and which it would be imprudent on his part to discuss, is "reviled." But whatever the consequences, I shall venture to make some remarks on a few of Professor Huxley's recent utterances, even at the risk of being also condemned as a reviler.

What do you think of the attempt to convince people of the similarity or identity or close relationship between non-living matter and living matter, by calling a non-living particle and a living particle a "molecular mechanism," and by further asserting that non-living matter can be resolved into "molecular mechanisms," and that living matter will also be resolved into "molecular mechanisms?" Huxley tells the Medical Congress that matter is an aggregate of "*molecular mechanisms* performing complicated movements of immense rapidity, and *sensitively adjusting themselves* (!) to every change in the surrounding world." But fancy giving to a particle of lead or iron this power of "*sensitively adjusting itself*." Is there any one in the world, besides Professor Huxley, who would apply such language to non-living matter? By giving to the non-living the attributes peculiar to the living, Professor Huxley succeeds, according to his own satisfaction, in breaking down the contrast between living and non-living matter; but will any one else believe that anything of the kind has been done?

Is it not almost a disgrace to the thought of our time that such transparent fallacies and absurd misrepresentations should not only be allowed to pass without comment, but receive the sanction and approval of many scientific men? Again, Professor Huxley tells the Medical Congress that vital actions are "*nothing but* changes of place of particles of matter." What vital action in this world is *nothing but* a change of place in particles of matter? The statement seems not only unsound, but unfair. To say that any vital action is *nothing but* a change of place of material particles is surely absolutely incorrect, for not only are all vital actions much more than this, but physical actions are more. It is obviously the something more than mere change of place that makes the difference between one form or kind of action and another. If there was *nothing but* change of place, it is clear there would be but one action in the universe, instead of infinite variety of action.

Qualities and properties are by materialistic authorities attributed to matter or denied to matter, as may be convenient; but any attempt to explain the difference between a particle of living matter and the same matter when it has ceased to live, is carefully avoided. It is suggested that the

only difference is a difference in the rate or degree of activity of the molecular mechanisms of which matter dead and matter roasted and boiled, living, not living, of every kind and form, and in every state, is composed. The matter which consists of molecular mechanisms includes, of course, simple and compound substances. Iron, oxygen, a particle of roast mutton, and a particle of living matter, are all included in one category. All consist, according to Professor Huxley, of molecular mechanisms; but the molecular mechanisms of some of these things must consist of more elements than those of others, and the mechanisms of the living protoplasm are surely capable of movements of a character totally different from those of the oxygen. Moreover, it is certainly remarkable that the molecular mechanisms of all forms of "protoplasm" should contain the same four elements. By abstracting one or more of these, the molecular mechanisms of protoplasm would be destroyed, and yet molecular mechanisms of some kind or other would remain. Mr. Huxley does not tell us how we are to distinguish the simple molecular mechanisms from compound molecular mechanisms, nor how the molecular mechanisms of a simple substance like lead differ from those of a compound like his protoplasm. It would seem that the molecular mechanisms of lead are, according to this hypothesis, as much alive as the molecular mechanisms of living protoplasm, but that the latter are more active than the former. They differ in degree, but not in kind.

Professor Huxley must surely have formed a rather low estimate of the intelligence and critical power of the medical profession, to expect them to be convinced by him that the only difference between living matter and non-living matter, is a difference of degree. He asserts that there are complicated movements in the matter of which all living and all non-living matter consists. And without one word of explanation as to what he means, he tells an audience, consisting of highly-educated men from every part of the world, that "the microcosm repeats the macrocosm, and that one chain of causation connects the nebulous original of suns and planetary systems with the protoplasmic foundation of life and organisation." Is thought, I would ask, to be silenced by such nebulous nonsense as this? So far from anything like a chain of causation having been shown, not two links of such supposed chain have yet been discovered. But the whole chain of causation which connects nebulous originals of suns and planets with protoplasmic foundations is of so nebulous a nature that it scarcely deserves notice. "The microcosm repeats the macrocosm," says Professor Huxley; but the more

this metaphorical utterance is thought over, the more difficult does it seem to be to get any definite meaning out of it. What particular minute living thing or microcosm is in the least degree like the world, or like the universe? In what respects, for instance, does a monad or an amæba resemble the world? Surely it is time that people of intelligence should really consider what is gained by vague utterances like the above. We have had during the last fifteen or twenty years no end of materialistic suggestions, prophecies, and promises, but little besides incoherence and inaccuracy have as yet been established. One wonders what the representatives of medical science of all nations thought when they were assured that the microcosm repeats the macrocosm, and what meaning was attributed to these words by those who heard them.

The word "like" has been very curiously employed by many physical authorities, and, strange to say, in many assertions to which I could point, "unlike" would be nearer to the exact truth, as, for example, in the following dicta, *unlike* ought to be substituted for *like*:—Man is *like* a machine; man is *like* a monkey; living matter is *like* white of egg; a living thing is *like* a watch, and a windmill, and a hydraulic apparatus; the body is *like* an army. Now, if any one will point out the respects in which these things are alike, I have no doubt some one will be found who will point out in what respects they are unlike, and then the public will be able to decide which of the two words: *like* or *unlike* is more correct.

"Vital phenomena," says Professor Huxley, "*like* (!) all other phenomena of the *physical* (!) world, are resolvable into matter and motion." Here, as in many other cases, Professor Huxley begs the question. The assertion that vital phenomena belong to the physical world is not to be justified by demonstrated facts. No purely physical phenomena are like any purely vital phenomena. How can vital action be of the physical world when it appears and disappears, while the matter with its physical properties still remains? Between the *motion* of the particles of living matter and the *motion* of particles of non-living matter there is all the difference imaginable—an essential, an absolute, an irreconcilable difference. Materialists, of course, assume and assert the contrary; but, instead of wasting time by assertions, why do they not adduce an example of movements occurring in some form of non-living matter exactly resembling those which occur in living matter? Much of our scientific teaching is now intensely and ridiculously dicta-

torial. Instead of persuading people to consider and admire natural phenomena, and to think over the wonders around them, some scientific authorities think to spread their views, by threatening to place all who do not agree with them in a class, in which nobody likes to be included, however large it may be.

Professor Huxley, with that curious partiality for contradictory statements which distinguishes many of his utterances, condemns in one place the idea of an "indivisible unitary archæus dominating from its central seat the parts of the organism," and in another tells us that "the body is a machine of the nature of an army." Every army to be of any use must, of course, be under a head of some kind or other, but Mr. Huxley's army has no general or indivisible unitary archæus of any kind. Each soldier is, I suppose, to govern himself under inexorable laws enacted when everything was in the state of primitive nebulosity. The army of Professor Huxley is, as we shall see, the most marvellous of all nebulous machinery yet discovered by materialists.

Now let us admit for a moment that the body may be compared to a "machine" of the nature of an army. How does the comparison help us to understand the nature of the body? For is not the army actually composed of a number of machines of the very same kind as that body machine which is said to be like it? What, therefore, can be gained by the comparison? Obviously nothing would be gained by telling people who wanted to learn about the nature of a sheep that it was like a flock of sheep. But the body is a machine of the nature of an army, and the microcosm contains the macrocosm, and, therefore, possibly the body, according to Huxleyan logic, contains the army. But I may be wrong, for it is not an *army*, but a *machine of the nature of an army*. We have machines of the nature of a watch, machines of the nature of a windmill, and machines of other natures, but the machine which the body is like, is of the nature of an army. But this last "machine" is essentially different from all the other machines because it is composed of living men while machines in general consist of non-living materials. In short, Professor Huxley uses the word machine just as he uses the word protoplasm in speaking of that which is living as well as of that which is not living!

But Mr. Huxley's "machine of the nature of an army" shall be further examined. It will be found to be very peculiar indeed, whether it is compared with machines or with armies. The army of Professor Huxley would not be recognised as an army by any general, or by any soldier in

existence. This remarkable army has "its losses made good by recruits born in camp." This is an excellent idea for increasing the number of soldiers, and may be recommended to the War Office.

In the body "each cell is a soldier," says Mr. Huxley. If so, I suppose each cell has the power of acting, of displaying intelligence, of obeying the word of command, and carrying out the orders of the general. In a few sentences further on, as well as in many papers he has written, he deprecates this view altogether, and talks about vital actions being "nothing but changes of place of particles of matter," and he looks forward to "the analysis of the living protoplasm itself into a molecular mechanism." The body he regards as "a synthesis of innumerable physiological elements," each of which may be described "as protoplasm susceptible of structural metamorphosis and functional metabolism."

After all our work, all our chemical, physical, and microscopical investigation—after all that has been gained by most minute and careful anatomical investigation carried on for many years, Mr. Huxley comes forward, and in the most public manner possible, tells the world that the body is not like a watch, or a hydraulic apparatus, but an army—but such an army as never has existed and never could exist—an army not to be conceived by the imagination, an army beyond all powers of reasonable conjecture; an army, the fighting power of which would be destroyed not only by the birth of its recruits, but by the necessary phenomena which would precede that interesting event. But, alas, this is not all, for this army of Professor Huxley's, strange to say, is unfit to survive, for does he not tell us that it is certain of defeat in the long run! Professor Huxley's army is not an army at all, but only an imaginary heterogeneous collection of nebulous impossibilities. It is scarcely credible that such suggestions as those I have criticised could be seriously made in the presence of hundreds of representative medical and scientific men from all parts of the world. You will, however, find them on p. 99 of vol. i., of the "Transactions of the International Medical Congress."

And what end is served by such comparisons? Are we taught anything by such incongruous metaphors? In what particular is any living thing like a watch, or a hydraulic apparatus, or an army? There is not one of the ridiculous comparisons which have been made which helps any one to form an accurate notion of the nature of any living thing in existence. Half the utterances of this kind serve but to confuse and lead the mind away from the truth about life and

the phenomena peculiar to living things. That all this loose, rambling talk concerning questions which can only be determined by observation experiment and reason, should be listened to by intelligent persons is but evidence of the decay of thought and the general love of submitting to the dictation of a tyrannical, materialistic coterie, which, being at this time very popular, attempts to arrogantly dominate over sense and reason.

He who studies any living thing in existence at any period of its life, or the smallest portion of any form of living matter, will soon be convinced that it would not be correct to say that it was like anything else in nature, except some other form of living matter. For it will be found that certain phenomena which characterised the particular living particle characterise all living particles of which we have any knowledge or experience. Further investigation will convince an enquirer that vital phenomena are not comparable with any phenomena belonging to non-living matter. They are, in fact, peculiar to living matter. Between purely *vital* and purely *physical* actions not the faintest analogy has been shown to exist. The living world is absolutely distinct from the non-living world and instead of being a necessary outcome of it, is, compared with the antiquity of matter, probably a very recent addition to it—not, of course, an addition of mere transformed or modified matter and energy, but of transcendent power conferred on matter, by which both matter and its forces are controlled, regulated, and arranged according, it may be, to laws, but not the laws of inert matter.

It is not only one or two of the positions assumed by the materialist that are open to doubt or objection. The whole contention is, and has been during the last twenty years, utterly untenable, because facts have been known which completely controvert all materialistic views which have been put forward. Mere popularity, it need scarcely be said, goes for very little, unless the facts and arguments urged in favour of the doctrines can be shown to rest upon evidence. Neither is it a question of much consequence how confident individuals may be who countenance or endorse the hypothesis, That any vital action in nature is due to physical forces only. Nor can concurrence of opinion on the part of even a large society, or a tendency of thought, however marked, be accepted as conclusive. What is required is, that the arguments advanced in favour of this view should bear the test of examination. Instead of this being the case, many of these arguments have been over and over again conclusively shown to be worthless; and a critical examination more

thorough than that to which they have been hitherto submitted will certainly be so much the more demonstrative of their worthlessness. It is utterly unreasonable to assume, as has been continually done, that the laws which govern vital actions are the very same laws as those which all non-living phenomena obey. There is not at this time a shadow of evidence in favour of such a contention. It rests only upon pure assumption, and is one of the most reckless and most unjustifiable of the many untenable assumptions to be met with in the history of thought. It is opposed to facts of common experience and observation, as, for example, the growth upwards of a tree; but this as well as other facts have been explained so as to fall in with the assumption.

It may be freely admitted that if we attribute to vital power certain phenomena of the living world, which have not been, and cannot be, explained or accounted for by any physical laws yet discovered, we thereby assume an agency which we are unable to isolate or demonstrate, and the existence of which we cannot in any way prove. On the other hand, it is only fair to observe that, if we assume that phenomena peculiar to life will some day be explained by physics, we certainly act in a manner which is not sanctioned by science—we assume, we prophesy, and prophetic assumptions of every kind are contrary to the spirit of science. But, if we accept the dicta of many popular teachers, and assert that these vital phenomena are, indeed, physical, we assent to a proposition which has been actually proved untrue, and which has been shown over and over again to have no foundation, in fact, experiment, or observation. Nevertheless, it may be urged that it is no more incorrect or against the spirit of science to assume that a physical explanation will be discovered at a future time, than to assume that the phenomena are due to a force or power which we cannot isolate, and the nature of which cannot be demonstrated. But is it not in accordance with reason to assume the existence of a peculiar power to account for phenomena which are peculiar to living beings, which differ totally from any known physical phenomena, and which cannot be imitated—and is it not contrary to reason to prophesy that such phenomena will one day be explained by ordinary forces or powers? Notwithstanding all the tremendous efforts which have been made by intellects the most robust to persuade themselves and others of the promise and potency of the molecular mechanisms of their imaginations, up to this very moment, nothing which in the least degree justifies their positive assertions has been discovered. Nothing like a vital phenomenon has been explained by physical science or imitated in the laboratory.

The simple truth is that the essential phenomena of all living beings cannot be explained without recourse to some hypothesis of power totally different from any of the known forms or modes of energy. Any one who allows his reason to be influenced by the facts of nature as at present discovered will feel obliged to admit the existence of vital power as distinct from, and capable of controlling, the ordinary forces of non-living matter. It has been conclusively shown that the laws of vital force or power are essentially different from those by which ordinary matter and its forces are governed. My own views on this matter, put forward during the last twenty years, have, of course, been ignored by materialistic prophets; but it is satisfactory to find that now and then the word *vital* is actually used in speaking of phenomena, not to be explained by physics and chemistry, by some scientific men who, nevertheless, support the doctrine that vital is, after all, but a form or mode of the ordinary physical action of non-living matter. The fact is, those who act thus feel the weakness of the cause they advocate, and try to hide their confusion by vagueness and obscurity of expression. Within a very few years, the hypothesis of molecular machinery will probably be forgotten, and the operation of vital power, as distinct from any ordinary force of matter, will be generally admitted and taught.

Purely vital phenomena are manifested by every form of living matter from the highest to the lowest. They are temporarily resident in matter which has been derived from matter in the same state, and when once vital phenomena have ceased they cannot be caused to recur in the same particles. Although it is frequently alleged that there is only a difference of degree between the changes in living matter and those in non-living matter, no one, as I have stated, has been able to support this proposition by facts and arguments, or to adduce one single example of matter in any state which illustrates the asserted gradations of change from the living to non-living, or from the latter condition to living. The more we learn concerning the ordinary properties of matter the less probable does it appear that these properties will ever be found adequate to account for the facts of living. How can any reasonable person expect that the disposition of the materials used in the construction of any apparatus or organism will be adequately accounted for by a demonstration of the properties of the materials themselves? Material atoms in living things are made to take up certain definite relations with respect to one another which no experiment has shown to be due to, or to depend upon, properties associated with the matter. Nor

is it even conceivable that property which is unalterable should determine movements and the formation of structures which change from time to time, and the form and exact character of which last must have been foreseen and prepared for from the very beginning. The act of construction, the arrangement of material particles according to a definite and pre-arranged plan and for a special purpose, can no more be attributed to the properties of the matter in the case of a living being than in the case of a watch.

The advocates of materialistic doctrines do not offer a suggestion as to the precise changes which occur when what they deem to be merely a compound substance containing oxygen, hydrogen, nitrogen, and carbon, and, possibly, one or more other elements, passes from the living to the non-living state. The new materialists stand alone among all the sects known to history in not being able, nay, in not attempting, to establish their views by arguments or to support their doctrines by appealing to facts and reason. They content themselves with authoritative declarations of the most positive and solemn kind, but which, from a scientific and philosophical standpoint will be pronounced by dispassionate critics absurd and contrary to fact, and, therefore, not creditable to science. They command people to believe, and encourage them to have robust faith, but as for evidence in support of their materialistic tenets they have literally none. If people generally were acquainted with the facts revealed by the microscopic examination of living matter, and would allow their minds to be influenced by what they observed they would no more believe in the dicta of the materialist than give their faith to an authority who declared that the earth was flat.

The general acceptance of materialistic doctrines is, in itself an indication how little thought is given by most people in these days to the importance of inquiring into the nature of the evidence upon which far-reaching conclusions they too readily receive are supposed to rest. People have been misled in times past by false teaching, and large numbers have become steeped in ignorance, bigotry, and fanaticism. But I do not believe that the most lamentable instances on record have led to results more disastrous, or more likely to prove injurious to the interests of individuals and possibly to nations than this attempt in our own time to establish the weakest and worst form of materialism ever advanced, is calculated to produce in the future. It is bad enough when numbers of people become converts to a system founded on truth more or less perverted, or misinterpreted, owing to the ignorance or mistaken zeal of its exponents ; but

the evils resulting are evanescent and harmless indeed as compared with those which must result from inculcating a system which professes to be founded on reason, but which really rests upon fictions and arbitrary assertions,—a system in which fact is appealed to, but is not to be found. Look at it how you may, you will not discover the smallest speck of firm ground of truth upon which to build any form of the materialistic doctrine. The phantom of possible molecular mechanisms,—confusion between mere energy and the power by which it is directed, between a machine and its maker, between designing and making in form and order and for a purpose, and the mere purposeless piling of particles of matter one upon another, or their equally purposeless falling down, are a few of the erroneous comparisons frequently made and accepted as if they were compatible with reason, and even trophies of recent scientific conquest.

By materialism it is sought to reduce vital phenomena to mere attractions, repulsions, affinities, and to annihilate the idea of vital power. Materialism can only be sustained by the suppression of truths and by ignoring facts that are known, and by a most fantastic and reprehensible system of using the same word in very different senses, and in applying the same term to things which widely differ from one another and even exhibit opposite qualities. By intellectual devices which are certainly not creditable to intellect, the absolute and irreconcilable difference between the *non-living*, and the *living*, and the *dead* are ignored by some, and denied by others; *difference of degree* is substituted for *absolute difference*, while *identity* is not unfrequently made to do duty for *diversity*, and *like* is used where *not like* would be more correct.

THE LIVING AND THE NON-LIVING.

The following remarks upon this subject were made by Professor LIONEL S. BEALE, F.R.S., during the discussion on Dr. Wallich's paper* "On the Fallacy of the Materialistic Origin of Life," read before the Institute, April 17th, 1882.

I propose to offer a few remarks on the view taken by Professor Huxley and other scientific men, both here and on the Continent, in reference to the very important question of the transition from the non-living to the living.

* As yet, ill-health has prevented this author completing his paper for publication; but it is hoped that it may form part of No. 64 of the *Journal*.
—Ed.

I am quite sure we shall agree that this is really the kernel of this most interesting subject. We are constantly told of the gradual passage from the non-living to the living, and the formation of a living thing is often spoken of as if the process were something like the change which takes place in the formation of crystals. Most authorities who support the materialistic hypothesis draw a parallel between the formation of the lowest forms of living matter and crystals. Now, it must occur to every one who has at all considered the subject of crystallisation, that although there may be great difficulty in explaining the exact nature of the process, yet, nevertheless, it is well known that when a certain material is dissolved in fluid under certain circumstances, and the solution becomes concentrated, crystals are formed. Every tyro in chemistry has, probably, performed the experiment with common salt; and every such tyro, after having crystallised common salt, has re-dissolved it, and re-crystallised it again and again; and, if he were to go on crystallising and dissolving to the end of time, he would only produce crystals of the same form and the same chemical composition. Now, let him try to do this with regard to a living organism. The living organism is there. We know that every particle of living matter has come from a pre-existing living particle; but let us endeavour to take ourselves back to the time when there existed only the non-living, the inorganic matter out of which the living had to be formed according to a method as is affirmed somewhat resembling that of crystallisation. The chemical compounds that form the living matter—oxygen, hydrogen, nitrogen, and carbon—are supposed to come together in obedience to certain attractions and affinities which these primitive particles possess, but of which we know very little; but let us suppose a living thing is formed. Let us imagine the particles brought together in the manner supposed, and that a particle of living matter makes its appearance. We examine this particle, and try to ascertain its nature, and for this purpose we try, as we have tried in the case of the crystal, to dissolve it. What is the result? We destroy it; we do not dissolve it. (Hear, hear.) It ceases to be living matter before solution begins. It is no longer what it was before, and we cannot make it so. It has gone; it has ceased to be what it was, and we are not dealing with a living particle, but simply with the material that has resulted from the death of that which was before alive. We cannot re-form it. Once dead, it is incapable of being re-produced. Therefore, it seems to me a most extraordinary thing that some of the greatest authorities in science should pretend to compare the formation of living matter with the formation of crystals. There is not the slightest analogy, nor the faintest possible parallel, no comparison between living things and crystals. There is all the difference in the world between the process of crystallisation and the formation of living particles, which are supposed by Haeckel, and others who adopt his views, to be alike. Whatever may be the marvellous changes that occurred in the first formation of living matter, they cannot resemble in the slightest degree any phenomena with which we are familiar. There are no properties of matter that have as yet been discovered that can give us

the faintest conception of the nature of the changes which must have taken place when the first living thing was formed. With regard to the question of complexity and simplicity, of which a good deal has been said, I will just offer a few remarks, and will then sit down. It seems to me to have been assumed in a most extraordinary way that some forms of living matter are extremely simple and that others are extremely complex. I should like to ask what is the meaning attached to these terms "simplicity" and "complexity," when applied to living matter? Let us take the monera, said to be among the simplest forms of living matter with which we are acquainted. All we can see is clear, colourless, transparent, structureless, semifluid matter. Where is the evidence that the composition of this is more simple than that of the most complex living matter in existence? Take, for example, the highest form of living matter we know—the living matter which forms part of the brain cells of man himself, for I suppose we cannot conceive anything much higher. If we were to assume gradations of complexity and different degrees of superiority, we might go as far as to suggest that at any rate the highest and most complex living matter is to be found in the grey matter constituting the outer part of the human brain. But what is the fact? The matter we find there is no more complex than the living matter of the simplest monad, as far, at least, as we know. If we take this brain matter and examine it, we find that we can resolve it into certain organic substances, closely allied to the albuminous material which Professor Huxley and others call protoplasm, although they are not able to define precisely what they mean by the term. (Hear, hear.) They are unable to tell us in what way protoplasm differs from albumen, and muscle tissue, and a thousand other things. They simply make use of a name almost without a meaning. Well, the highest conceivable form of living matter, as far as we know, closely accords in its composition with the lowest form of living matter; and, as far as regards structure, if we examine that which comes from the highest organism, and that which is concerned in the formation of the lowest, no difference whatever can be distinguished. It is not that one is more complicated, or exhibits a structure different from the other. There is no structure in either. Both are perfectly clear, transparent, and structureless, and yet one is concerned in the performance of certain functions and offices, while the other is concerned in the performance of totally different functions and offices. Are we, then, to believe that the difference in the functions discharged is due merely to the chemical properties of the substances of which the living matter is composed? We cannot do this, because, when we come to analyse the two different kinds of living matter, we find in the material which results from their death the same elements. And, if the elements are not in precisely the same amounts or in the same proportions to one another, the difference which may exist in the composition bears no relation and has no reference that can be discovered, either to the difference in action or to the different structures which may be evolved from the two different forms of living matter. Therefore the terms "simplicity" and "complexity" seem to me to be totally inadmissible, and I venture to think that not one

of those who are in the habit of speaking of simple and complex forms can give a rational explanation of what he means by the phrases he employs. What is generally meant by the simplest form of living matter is that when it attains its highest form of development it is still a simple thing, and what seems to be understood by that of the greatest complexity is, that when it attains its highest degree of development certain marvellous structures are produced; but when we come to look at the living matter itself there is no difference to be discerned by any means of examination yet adopted between the two forms. The living matter, which, at the very earliest period of his development, represents man, is, as far as I know, not distinguishable from the forms of living matter of which the simple bodies Dr. Wallich has so lucidly described to us are made up. And therefore the difference cannot be chemical. Neither can it be called physical, nor mechanical, nor can it be due to difference in machinery or mechanism, for none is to be discovered. The difference is enormous, and it is of a most remarkable kind, but it is not to be explained by any facts in physical science with which we are acquainted. All we know is, that under certain conditions one form of living matter *grows* and produces a certain kind of structure, and that under different conditions certain other forms of living matter *grow* and produce a structure that is totally different. The difference between the two is not in molecular or chemical constitution. They do not remarkably differ in chemical composition, and we may safely say it is impossible thus to explain the difference. That is the whole of the matter; the difference in the results cannot be explained by physics or chemistry, and I do not think it ever will be so explained. The difference is one which can only be spoken of under another term altogether, and this is a word to which many object very strongly. I allude to the word "vital." The difference in question is a vital difference, dependent not on a property which belongs to matter itself as matter, or derived from any properties in connexion with the elements which enter into the composition of the living matter. Whether the generation of living matter was spontaneous or not cannot be proved, but much scientific speculation is built upon the theory of spontaneous generation. However necessary such a theory may be to the doctrine of evolution, there are no scientific facts which can at all warrant the conclusion that non-living matter only, under any conceivable circumstances, can be converted into living matter, or at any previous time has, by any combination, or under any conditions that may have existed, given rise to the formation of anything which possesses, or has possessed, life. (Applause.)

ON THE NEW MATERIALISM.*

By LIONEL S. BEALE, F.R.S.

I propose in as few words as possible to ask those present to consider certain views bearing on the first principles of religion and philosophy which have exercised during recent years and continue to exercise an extraordinary influence upon the opinions held by many persons of intelligence. Acquiescence in the views in question, I think it will be found, involves the acceptance of ideas which are not consistent with one another, of doctrines which are contradictory, and principles which are incompatible or even mutually destructive. To give this fashionable confusion of doubt, denial, assertion, assumption, conjecture, prophecy, any name which has been already adopted by any philosophic or religious sect that has existed in the past, would be unjust, for the conflicting opinions now entertained cannot be formulated, and it is doubtful whether, among those who have consented to adopt them generally and vaguely, any two persons could be found who would agree concerning the elementary propositions on which anything like a philosophy could be established. Neither of the terms Rationalism, Materialism, Agnosticism, is strictly applicable to this most recent and most fanciful of all the creeds ever offered for adoption. To call it Rationalism would not be correct, for it does not rest on reason; indeed, it is neither reasonable nor rational. Materialism would be equally inappropriate, and no disciple of Epicurus would admit that it at all resembled the doctrine to which he had given his adherence. Neither the hypotheses, nor the assertions, nor the prophecies of the materialist of the new, would be recognised or approved by one of the old school. Agnosticism, again, would be a complete misnomer, for the advocates of this new philosophy profess to know all things and to account for all the phenomena of nature. They tell us not only the origin but the end of all. Commencing with cosmic vapour, they trace the evolution of all non-living and living, and discern the further changes which are to progress through a distant future until all again eventuates in cosmic mist. Those who know all this can hardly be denominated Agnostics.

One grand central principle of this new philosophy seems to be the assumption that what is not now capable of proof, but is affirmed to be true by its exponents, will be proved to be true by new discoveries which we are assured will certainly be made at some future time by the scientific investigations of that period,—among which discoveries is to be the proof of the confident assertion now so often repeated, and considered to be a

* Being an Address delivered in July by the Author, and specially revised by him for the Victoria Institute. It is inserted here by reason of its importance.—ED.

cardinal point, that the difference between a living thing and the same thing when it is dead, which difference seems to ordinary comprehension so very remarkable as to deserve to be called absolute and insurmountable, is but a difference in degree. The evidence in support of various conjectures concerning changes in the properties of material particles and alterations in the character and properties of living forms is also supposed to be forthcoming at some future time. Upon the fanciful basis thus constructed out of what may be discovered in the time to come is raised a strange and grotesque superstructure of philosophical speculation, contradiction, and inconsistency, perhaps the most curious ever presented for the acceptance and admiration of mankind. Amid all the vagaries of the intellect are to be noticed the most ardent belief in and superstitious reverence for future hypothetical revelations.

Propositions which from their very nature must depend upon faith are rejected by the disciples of the new philosophy as unworthy of belief because they cannot be proved by observation, or put to the test of experiment, or the facts on which they rest be rendered evident to the sense of touch, sight, or hearing. On the other hand, things that have not been proved by observation, but which are within the limits of observation, which have not been demonstrated, but which would have been susceptible of demonstration had they really existed, are to be believed and at once accepted as literally true, because it has been affirmed by scientific teachers, who cannot possibly err, that all things and all phenomena are unquestionably due to the operation of laws of matter about to be discovered, and because certain views concerning things in general, and living things in particular, have been accepted by the established intellectual authority of the time, from whose decision there is no appeal.

The vague and most unsatisfactory hypotheses which are often accepted and believed in as if they were well-ascertained truths of science would have but little chance of acceptance but for the doubt and confusion of thought concerning fundamental principles of religion and philosophy which now prevail, and which, indeed, may be said to characterise the time in which we live. An incomprehensible yearning after breadth of view and an inexplicable terror of being accused of being bigoted and narrow-minded seem to paralyse the judgment and render some of the most intelligent amongst us infatuated victims of materialistic inspiration. The longing for ever-increasing breadth of view has led to the acceptance and teaching of doctrines which are contradictory and in some instances mutually exclusive. Conclusions which involve the denial of the existence of God are not unfrequently accepted at this time by persons who profess to believe the Christian faith. Incompatible and contradictory principles have been made to appear to harmonise by completely altering the meaning of the words employed, and it is doubtful whether any of the original meaning attached to certain most important words is now left. The word "God" is often used as if its whole meaning was comprised in creative power or first cause; and, as to the word "Christianity," its meaning has been modified in so many ways of late that

it would be most difficult to determine what is included and what excluded. In the time gone by Christian atheism would have been regarded as an absolutely impossible form of belief, but would it be quite impossible now to find persons ready, perhaps unconsciously, to justify the phrase Atheistic Christianity?

Some would have us believe that all things living have resulted from the working and inter-action of the forces belonging to non-living matter only, and expect us to be convinced further that the above view of the conversion of the non-living into the living, in obedience to laws which govern matter only, is not inconsistent with the acceptance of the belief in one creating, designing, omnipresent, omniscient, omnipotent will. It has also been held that a God who only creates the Universe, which he then practically abandons, is equivalent to a living God that governs the world and ordains everything according as He wills,—not only the Maker, but the Preserver of all things. But is there no interval between the idea of a first cause originally creating matter and enacting laws for its subsequent guidance and arrangement, and the idea of an existing, living God who governs the world, to whom men may with reason appeal for counsel and guidance, whom they may obey, and to whom they are indebted for life, and health, and everything? Does first cause comprise all that men imply when they speak of the everlasting living God? Does creative power and law-enaction include all the attributes of the God of man? If so, it is indeed, as has been suggested, a very small matter if by modern discovery the scene of the operation of the first cause is put back in a past somewhat more remote from our era than has been hitherto supposed to be the time of its activity. For in this case we should undoubtedly have, as has been suggested, a first cause to fall back upon, still a creator to acknowledge, a law-maker to reverence. But I would ask in all seriousness whether any form of the evolution hypothesis, which dissevers God from all that follows upon the primal act of creation, is consistent with serious belief in His existence,—in fact, belief in a *living God*? What man could worship, pray to, love, or adore such hypothetical first cause? I beg of you to consider whether this conception of the operation of a once-creating, once law-enacting first cause in a past inconceivably remote is an adequate substitute for the theistic idea which has been held for more than two thousand years. However positively some may affirm that the view objected to is not atheistic, it must be held to be of this nature unless the word is used in a sense which no one who believes in a God could allow. I have myself often begged for information concerning the powers and attributes of the God sanctioned by the evolution hypothesis, but so far in vain. The suggestion that the idea of continuousness, or the exercise of power transmitted through matter from the first beginning, or the continuous extension of working and action of such supposed first cause is equivalent to the idea of omnipotence, omnipresence, omniscience, is surely almost an insult to the understanding. Ought not those who care to acknowledge such newly-invented first cause, and those who foolishly try to

force on themselves and others the acceptance of the proposition that the views impugned are not atheistic, or only in a very slight degree atheistic, to accurately define the powers and attributes of the God they would substitute for the God in whom men have hitherto believed? If this were done, we should be able to judge whether it was possible for men in their senses to acknowledge such a power, to submit themselves to its guidance, to love, honour, and obey it, to worship it, for the God of man demands all this and more. Judging from much that has been said and written upon this subject during the last few years, it is difficult to come to any other conclusion than that the real aim of many who speak and write in favour of the new views is to destroy, and within a measurable period of time, belief in the existence of the Supreme Being, in Providence, and in a living God, and to force those who think at all to endeavour, by the mightiest mental effort of which they are capable, to train and exercise their minds by the contemplation of an everlasting infinite nothing. Instead of the new doctrines being explained in detail, we are assured by patronisers and promoters of this retrograde nonsense that the reasonings of So-and-so, who has, in fact, done what he could to prove there is no God, "are inspired by a reverence which is truly religious," and so on, until every one capable of thinking must feel weary of such mawkish adulation and misrepresentation of fact. Of course, the real question is whether, in such a system as has been proposed, any power deserving the name of God is required or could possibly find a place, and then what powers the Deity permitted to exist possesses. A God without will, without power to arrange, order, design according as he wills, can hardly be worshipped by man. For, can omnipotence restricted in its operation by inexorable laws be omnipotent? Is not the idea of omnipotence and omniscience, testing by experiment the results of infinite constructive power, worthy of a philosophy hereafter to be distinguished, for physical revelations supposed to be about to be made, and its rejection of the theistic idea?

Much confusion has resulted from the acceptance of fallacies concerning the nature of the changes in living matter, and the dictum, not proved nor at this time provable, that the living and the non-living are one, governed by the same laws and due to the same cause. The chasm between the living and the non-living has not been bridged, and it cannot be bridged by idle assertions to the contrary and speculations about cosmic vapour, however desirous the public may be that the operation of bridging should be accomplished. The form of Materialistic doctrine now popular neither accounts for any single operation peculiar to living matter, nor helps us to understand the nature of any one. Nothing whatever, I fear, has been added by physical science to our knowledge of the real nature of the marvellous change which occurs when a material atom passes from the non-living to the living state, and becomes an integral part of the very simplest or lowest living matter in existence. The nature of this change, which is unquestionably different in its essential nature from any known physical change, has not yet been elucidated, though it has been over and over again declared that it is

physical. In spite of all the confident utterances, no one has been able to explain, in terms known to physical science, any one of the phenomena occurring during any moment of the existence of the simplest living form in nature. The pretended physical explanations of growth, of the taking up of non-living matter and its conversion into living matter, the formation of structures, of organs, of parts made for a purpose, are utterly inadequate, while some are puerile, and would be dissipated by five minutes' careful consideration on the part of any one who has the requisite knowledge of the facts, as far as they are now known. Many of the statements about life and living matter will not stand the criticism of an intelligent critic, who, though knowing little or nothing of science, will take the trouble to find out the meaning of the words and the sense in which they are used, in order that he may detect cases in which words are inappropriate, and instances in which the same word is used in very different senses perhaps in the same page, as, for example, occurs in the use of the word "Protoplasm," which does duty for living matter, as well as for matter in the opposite or non-living state. If we could trace the atoms of matter through all their changes, until at last they lived, we should understand the nature of life, we should be able to lay down the laws by which vital phenomena are governed, we should understand the changes in our own bodies, we should know ourselves as well as the matter of which our bodies are composed. But in this case we should have spanned the infinite, solved all problems, explained all the mysteries, overcome the theistic idea, and man would have become a different being, and would find himself in a new position in nature.

But the changes which take place in the atoms as they flit from non-living to living are still unknown, and the probability of our ever knowing their real nature becomes less as knowledge advances. Man, notwithstanding all scientific discovery and material progress, at least, as far as regards his relation to and knowledge of the Infinite, stands much as he did in the early days of intellectual evolution. Here, then, is the immeasurable difference between the view entertained by us and that held by those who accept or incline towards the fashionable philosophy of the period. We who believe in the irreconcilable differences between living and non-living have been led to conclude that a knowledge of the real nature of the change, as well as a knowledge of the power by which the change is wrought whenever a lifeless atom becomes an integral part of living matter, is not to be obtained. On the other hand, the supporters of the new philosophy declare that all this and much more has been gained, and that much of what yet remains imperfectly understood will be brought to light by the advancing science of the future. We hold that such knowledge is not even conceivable in thought—not cognisable by the human intellect. They declare that the discovery of the nature of the vital change is nigh—nay, that in some respects it may be said that already it has been achieved. We do not admit that the road to such a goal has been found out or the method of proceeding which will be successful suggested. They assure the world that wonderful

things, not to be seen by ordinary mortals, have been discerned by privileged spirits. We believe neither in the powers of discernment claimed, nor in the being privileged, nor in the spirits. The whole position assumed by those who attempt to explain vital actions by physics and chemistry is untenable, and the pretentious assumption of knowledge as to what is to be revealed by the science of the future degrading to the thought of our time. The non-living state of matter is separated from the living state by a chasm which is unfathomable and which has not been, and which never can be, bridged, even in thought. The attempts which have been made to persuade ignorant people to believe that this has been done, or that it is within the bounds of that which is possible, are unjustifiable and antagonistic to the scientific method, and must certainly retard real progress.

The advocates of Atheism, or of that very nebulous form of Theism which logically leads to it, and is, indeed, practically Atheism, have utterly misled themselves and others by assuming the truth of the conjecture that the non-living and living are one, that matter in the non-living state differs in degree only from matter in the living state. They affirm in the most positive and reckless manner that this conjecture is a fact. Unlearned, unscientific people, believing that men of scientific authority would not have spoken thus positively unless they had distinct and irrefragable proof of the statements they made, proceed straightway to modify all the views which they had been taught in their childhood, abandon as fiction what they believed to be truth, and accept as realities the extravagant and fanciful doctrines of that scientific imagination which change from year to year, and concerning which there is but one thing certain,—that they proceed from and will return to the nebulous state. People hungering for a reputation for comprehensiveness, large-mindedness, and intellectual grasp, abandon their belief in the unseen without even being at the trouble of inquiring whether any evidence or argument can be adduced in favour of the new dicta. The sort of argument which seems to convince people, of course longing to be convinced, is to be found in assertions of the vaguest character about the nebulous originals of suns and planets being connected by a chain of causation with the physical basis of existing life and organisation. Can it be supposed that it is in any sense a valid excuse on the part of any thinking person to urge that the responsibility rests with those who teach these doctrines? The desire for being taught encourages the teachers, and if there was no longing for the doctrines of a silly form of science the supply would soon cease. It is surely as much the duty of intelligent persons to find out and expose erroneous teaching in science as in other departments of human knowledge. If but a very little trouble had been taken by some of those well qualified for the task, a good deal of nonsense which has excited curiosity, pleased the fancy, and deceived the intellect during the last twenty years, would have done no more harm than contribute a little intellectual amusement and help to sharpen the wits of the rising generation. Every person of intelligence ought to be competent to estimate the importance and reliability of reasons given for changing or subverting his belief in the fundamental facts of his religion, and most

would certainly, with far less trouble than they take to enable them to decide concerning questions of far less consequence, succeed in doing so. If, for instance, it is said that a living thing grows like a crystal, surely before the dictum is accepted by any one he would naturally inquire whether the new matter taken up by the living thing was deposited particle by particle upon the surface as in the crystal. Doubt would at once be excited in his mind, for no instance would occur to him in which during growth new matter was superposed upon that which was already there, in the case of a living thing. The nourishment always goes into the inside of a living thing, and is never deposited on its outside, as is the case in the crystal when it increases in size. Would it not also occur to him that the matter of the crystal can be dissolved and crystals formed again and again from the solution, while no living thing can be dissolved at all, much less re-crystallised? Such simple considerations would cause doubt to rise in his mind whether a living thing does grow like a crystal, and the doubt would suggest the expediency of further inquiry. He would require, before he accepted the new doctrines, that the particular points in which the so-called crystal-growth resembled and differed from living-growth should be clearly stated. So far from assenting to the proposition that the growth of a crystal was like the growth of a living thing, he would find that the increase in size of a crystal was not growth at all. So, too, with regard to the likeness said to exist between the living and non-living, the particular living and non-living between which this likeness is supposed to exist, should be pointed out. It is probable that the acceptance of many of the most absurd and unreasonable dogmas is due not so much to a want of power to think as to an indisposition to think, and no doubt acquiescence is promoted by a fear of the consequences likely to follow the rejection of, or any opposition to, the said doctrines. He who doubts or opposes is to be numbered with the fools. Nevertheless, I beg of you to consider what you would think of a person who assured you that a watch differed from the iron and brass of which it is made only in degree, and I leave it to you to determine what you ought to think of a philosopher who tries to make you believe that a living thing differs from the non-living matter of which its body consists in degree only. If at this time you press for reasons in favour of the conjectural unity of the living and non-living, all you will get will be some dictum about primitive nebulousity and chains of causation. Anything like criticism is so disliked by the new Materialist, that he condemns those who differ from him by anticipation, and thus for a time criticism is deferred, and his conjectures and fancies may find favour; but that people should be led away so far as to renounce their belief in any form of religion, to deny God, and to abandon their hope of a future state, is marvellous indeed.

In conclusion, let me commend to you the words of Kant. "Criticism," said he, "alone can strike a blow at the root of Materialism, Fatalism, Atheism, Freethinking, Fanaticism, and Superstition, which are universally injurious."

HUMAN RESPONSIBILITY.

BY
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HUMAN RESPONSIBILITY. By the Rev. G. BLENCOWE,
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JOHNSON defines responsibility as "accountability, or liability to answer." Hence, wherever there is responsibility, there is subordination and inferiority. A supreme or a perfectly independent being is responsible to no one; but in the measure in which our being and possessions are derived from another, and in which they are sustained by his continued operation, we are plainly liable to answer to him. The mechanic, who receives the material for his work from his employer, is answerable to him for the appropriate use of it. The farmer, who commits his stock to the care of his bailiff, requires from him full tale of all delivered, and of all the increase. The primary question, therefore, with respect to man is, Are we self-originated, are we independent?

How came I into being? There was a time when I was not, another time when the first cell of my complex body began to collect or protrude other cells, and to weave, by occult and mysterious skill, the wonderful structure which I now possess, and by which I am joined to and form part of the visible universe. There was also a time when I was first conscious of myself, and of objects around me, not myself, from which moment my consciousness and my thought have continued until now, increasing my knowledge of myself and nature and thus opening new sources of enjoyment and power.

But I had no choice in my beginning, nor in my construction, nor in my birth, nor in my endowments. All were without even my concurrence. I did not make or place the object which first evoked my consciousness, nor am I the author of those which by continual operation increase my knowledge and augment my power.

For my being I am immediately indebted to my parents, but not to their direct and immediate volition. For, when we compare human and brute procreation, we find a lack of uniformity in the former, which shows that a superior authority to our immediate parentage must be the source of life. All others have come into being in the same manner as ourselves; hence our relations to others and theirs to us are independent of our own will, we have all been without the possibility of choice, and, therefore, are plainly under the direction and at the disposal of some superhuman authority, possessed of power to fulfil his own purposes.

Here is a chain of accountability. First, to the author of our nature and the giver of our life. When a man constructs a machine, he has a right to its use and to dispose of it as he pleases. He also is presumed to have had some definite purpose in its construction, and the right, therefore, to employ it for this purpose, and to forbid its use in any way which will spoil or deteriorate it. And this right is considered sacred and indefeasible, in proportion to the excellence and value of the instrument constructed. How, then, can bounds be set to the right of the author of a nature like ours, with all its wealth of intellect, emotion, and will, which he has placed in conditions calculated to call forth every power to its full strength, to use, or to require its use, according to his own purpose?

But here we see the special distinction of humanity. We have a body, a wonderful and exquisite machine,—by which we receive instruction and various other benefits from the material universe, and by which we can act upon it, for good or evil,—but we ourselves are more than, and different from, a machine, however perfect. We are not instruments, as our body is, but agents. That is, we can see the nature of any and every act, the consequences which follow from it to ourselves and others, and the reasons why we should do it or leave it undone. And we are further able to determine, of and from ourselves, whether we will act in harmony with our nature and relations or not. We are, therefore, as much bound to answer to our great Author for the proper use of the personal and relative endowments committed to our trust as the driver of a locomotive is for the use of the engine put into his hands.

But our responsibility to the Author of our nature is not

bounded by our relation to Him simply as His creatures. We cannot have come into being without parents and other family relations ; we cannot give free scope to our affections, nor develope our intellect, nor act adequately, nor secure full bodily enjoyment, but as we form part of a community, the various members of which contribute to our improvement. And, as communal life is not a separable accident of humanity, but a necessity of our nature, we are bound to answer to its Author for the general good, so far as it is in our power to promote it. And it further follows that, as we are communal by the very constitution of our nature, we can by no means relieve ourselves of these obligations to our Author to live natural, that is, communal lives,—lives in which we shall seek, not our own good only, but the good of others also.

We are placed,—not have placed ourselves,—in this world, and in this vast and wonderful universe, which we have not made, which we cannot modify, not one of whose properties we can change, and to which we cannot add an atom. But we derive all our support from it, both as to body and intellect. Not only are its material resources unlimited, so that, by its orderly alternations, food, clothing, and every other requisite for happy and full physical life are furnished, generation after generation, but its structure and combination are so various, and multiform, and recondite, that it is capable of revealing to us, with continually-increasing clearness and breadth, the mode by which its great Author works. Thus it brings our intellect into contact with His, and teaches us the same order and breadth of thought as that which by a supreme volition has produced all things.

We know that the most exquisite skill of the mechanic is only a faithful copy of the order of the world itself, in the application of material properties in a material substance. All pure science is but a knowledge and application of the properties of number and space in their multiform combinations and relations. The deductions of the chemist are but the discovery of some of the secret processes of Nature, or rather of its great Author in His material operation ; while the artist, in his most noble and original creations, is simply using the material which the Creator has provided after His own method. Thus, the world is not only our habitation, but our school and our storehouse. Without it our body would die and our mind become inert.

But we are not only dependent on the great Author of all for the production and furnishing of this world, but also for the constant operation by which its forces are maintained, its substance renewed, and its life preserved ; for each of these

classes of facts requires similar operation for their continuance to that required for their original production. We cannot conceive of force but as a personal act; our idea of it is derived solely from the effort necessary on our part to produce motion; and, as we find that motion does not belong to matter, either in the atom or the mass, but is superimposed, so continued action is necessary from the original source for its continuance. We are unable to think of continued motion without continued energy. And, when we attempt to calculate the sum of the motion which is going on every moment in the universe, we find ourselves as utterly unable to approach a true result as we are to attain to an adequate idea of the mode of creation out of nothing. Yet there the motion is as a necessity of universal existence, and there, at its back, is the energy or force which is its cause: too vast and too wonderful for our comprehension.

But there is one side of this question of which we must not lose sight. We are evidently not in an orphaned, a forsaken world; but we have present with us everywhere the hand that formed, now sustaining all things.

This incessant operation is necessary for the continued renewal of the earth as the habitation of man. Without day and night, summer and winter, the disintegrating atmosphere, and rain and frost, the fertility of the earth could not be preserved, and its utility to man would cease; and we find ourselves unable to increase its utility but by taking advantage of the order first established, and by working on the same lines, after the manner of the miller who diverts the stream to his own wheel. He cannot create the stream, he can originate no force, but only employ what the great Operator has already provided. In like manner, all recuperative operation is not of human origin, but is simply the application of recuperative power lying ready to hand by the prolific providence of the Author of all.

Life requires certain conditions. The most elementary vegetable cannot exist without light and water. The animal must have organised substances for his food, and a properly-mingled atmosphere to breathe. Small changes in either are fatal. The world is full of life, full beyond possibility of numbering, and it does not fail. If we were able to form a judgment, we should incline rather to the conclusion that it has been increasingly abundant from the beginning. But if we cannot enumerate the lives, or even the varieties of life, how much more are we unable to tell all the observation, and the care, and the varied and constant operation which have been necessary from the beginning to perpetuate it.

Thus we are brought face to face with a mighty operating personality, all whose work tends to the preservation, and development, and perfecting of the universe; of which, so far as this world is concerned, man is the head and the only being capable of understanding the Author's purpose, and of employing the vast resources He has provided for our use according to that purpose. This greatly increases the range and the force of our responsibility. The man who is placed at the head of a grand operative establishment, having a large capital and many subordinates under his control, is bound to greater carefulness, diligence, and fidelity than any one under him. By this rule, how truly boundless is our responsibility to the Creator and Upholder of all things. We can conceive of no capability of our nature, no relation we sustain to others, and no donation of His providence, for which we are not bound to answer.

But is there a Creator? Have not all things come into being by the independent operation of matter, and from properties inherent in itself? Before we can answer this question, we necessarily meet another. How came the material substance of the universe into existence? It could not produce itself, because, if capable of acting, it could not act before it existed, and especially so mighty a work as creation could not come from a nonentity. But, in nearly all the discussions on the supposed action of matter, a hidden fallacy lies. Matter is spoken of as though it were one homogeneous substance, possessing unvarying and uniform properties and powers, and therefore capable of simple and immediate action. It is, however, well known that this is not its true character, but that the substance of the earth consists of sixty-three different elements, every one of which has a fixed and unchangeable nature, utterly incapable of transmutation, and some of them have an unalterable incompatibility with others; so that united action, for any such purpose as the creation and arrangement of the substance of our earth, is simply inconceivable. We could as well suppose that lions, tigers, bears, sheep, deer, and cows could unite in any undertaking for the general good. And there is equal difficulty in supposing that one element could produce another.

If hydrogen were the first which evolved itself from nothingness, how could it have produced gold, or iron, or carbon? If we suppose them all to have come into being spontaneously, who fixed the order of birth, and whence came the adjustment of proportions in the mass, so that

carbon is abundant and gold scarce? Whence did the affinities come? Did hydrogen construct itself on purpose to be able to take one atom of oxygen into union with two of itself to produce water? And, when both were self-made, whence came the pressure by which their combined bulk was reduced eighteen hundred times to make the great ocean of water? How were the diverse atomic weights determined, so that lithium is but seven, while bismuth is two hundred and ten? These are but a few of the thousands of questions which claim an answer before we can admit the independent action of matter.

And the difficulties are only removed a step further back, by the adoption of the only alternative which is possible to the Materialist,—the eternal existence of matter,—while that theory carries with it certain grave difficulties peculiar to itself. In the days of old, when matter was thought and spoken of as one simple whole, it was possible, with at least a show of reason, to argue for its eternity, but no man can contend for sixty-three eternals. Geology shows that, so far as our earth is concerned, there has been a constant process of disintegration and reconstruction from the beginning, every series of which is capable of measurement in time; and the most liberal donor of duration can go back to a precise and definite beginning. Astronomy also teaches us that the solar system can only have existed for a limited and definite period, while all through its existence the motions of the several members, both in direction and speed, have been ruled by strict mathematical law. But such science can scarcely be attributed to an assembly of unconscious and incompatible atoms. Thus we are compelled to look for some intelligent creator and distributor of matter in its various forms, adequate both in knowledge and power, to account for the existence and adjustment of the substance of the universe.

But we are now met by a theory which, taking matter as already existing, supposes it to possess inherent power of development into all the forms of life we now see. An initial difficulty here is the fact that, in all the changes taking place in mere matter, a strict law or order is, and must be, observed. In all chemical combination strict laws of quantivalence and proportion prevent any more than a definite and invariable number of specific atoms uniting to form any substance; while other laws compel the union of the appointed number when brought into juxtaposition. Thus, matter pure and simple as we find it in the atom, is incapable of independent action, but follows an invariable order, which has existed ever since matter existed. Development or progress, in material

combination and form, in and from matter, is therefore impossible. How, then, is it possible for matter, which cannot change the form of its own crystal, to produce life? Matter nowhere acts, but is acted on by forces exterior to itself.

Life in the simple form of the vegetable sack is totally distinct from and above all chemical force, which operates only by superimposed law. The crystal can only increase by accretion, which, however great, cannot alter the position, shape, or size of the one first deposited; but the plant selects from the atmosphere, the earth, and the light, those things only which it can assimilate, and by taking 'them into itself increases its own bulk, matures its strength, and propagates its kind. Here, therefore, we have powers which are nowhere seen in mere matter, and which are certainly of a higher order; and what matter has not it cannot give. If this be so with vegetative life, how much more with animal life, where we have in its most minute forms the wonderful power of volition, and in its progressive stages various vital and mental qualities, which are of an entirely different and much higher character than any vegetative force, and therefore much more impossible to mere matter.

But, supposing life in its simplest forms already to exist, we are taught that it has gone on improving into more complete forms, until the present species have come into being. If this has been so, it is matter of history; but we find no evidence of the existence of only imperfect and elementary forms of life in the earliest deposits, gradually growing up to perfection in the last. Then, as now, various gradations of complexity in structure, each suited to the conditions and purpose of life, existed as contemporaries. But, in all past times, we have no clear example of an animal in the condition of change from one species to another,* nor can we conceive of such change by any vital analogy of the present time. But, if the capability of such progress or development is involved in the very idea of life, as the theory supposes, it would not touch our present argument. For, as we have no example of spontaneous generation and cannot conceive of it, so we must, in this case, suppose this to be the mode by which the Creator chose to work; as the first life with all its potentialities must have been His gift. This is implied in the term evolution, which necessarily supposes involution, as potentially full as the evolution. "What comes out in the web must first have been in the loom, and the warp, and the weft." So

* Professor Huxley's argument as to the hipparion is very far from a proof.

that, whether our Creator chose to bring our body to its present state of completeness by a process nearly as long as that by which He fitted the earth for our abode or fashioned it according to the counsel of His own will, by the word of His power, when "He spake and it was done, commanded and it stood fast," in either case, He is our Maker, whether the process of making has been long or short.*

This, however, must not be taken as an acknowledgment of the correctness of the theory in question, which we do not accept because of the difficulties and contradictions which it involves. First, we have no authentic example of such transmutation as this theory requires, so that it is as yet mere theory. Then, we find that we have at present existing almost every conceivable variety of life, from the simple sack up to man, and we see no case in which these lower forms are passing into the higher. Darwin himself informs us that the earth-worms have retained their lowly but useful position from the first till now; nor can we conceive of the existence of sufficient intelligence in the lower forms to attain, or even aspire after, a higher. How could the simple sack, whose power of absorption extends over its whole surface, discern the advantage of tentacula, a mouth, and an alimentary canal? and, if he knew their benefit, how could he proceed to their production?

The sum of the whole, then, is:—1. Pure materialism is impossible. 2. Of evolution we have no proof and no authentic example. 3. Creation, pure and simple, is the only doctrine that meets and removes every difficulty and covers the whole case; while it is impossible to prove it false. Adopting the mechanical maxim of following the line of least resistance, we accept the infinite Creator, as attested and proved to us by the whole assemblage of mundane facts. We are His creatures in His world, sustained by His constant providence, and therefore we are accountable to Him.

A notable confirmation of this accountability we have in the faculty of conscience, which is possessed by all men. This power or faculty is an immediate perception or intuition of duty, which, although in nearly all cases it is capable of confirmation by subsequent processes of reasoning, is not the result of reasoning in the first instance, but springs at once

* This conclusion is the more necessary, as the accepted description of the origin or cause of evolution is, "The tendency in any given direction which gives a greater chance of life to the individual, but with which the will or the intelligence of the individual has nothing to do."

and in full force in the mind. In this perception of duty is involved the obligation of fulfilling it, which is accompanied by complacency on obedience, and by a sense of condemnation and remorse on disobedience. This is not an acquired but a primary faculty of our nature, and remains in active operation in all but the most degraded.

The force of this testimony to our responsibility is sometimes sought to be evaded by reference to the diverse decisions of conscience in different persons. It should, however, be remembered that this diversity in detail as to practice may, in all cases, be traced to previous error as to our relations to others. Thus, the ruler who has adopted the now-exploded notion that he has an unlimited right, by divine donation, to command his subjects after his own pleasure, and that any resistance of his authority is fighting against God, will feel little or no compunction in robbing or oppressing them. But although such falsehood, when taught in and from infancy, or accepted from common and popular opinion, may, to a great extent, pervert the judgment and dim the perception of duty, yet it remains a question whether any human being can plainly invade the right of others without compunction. And it is certain that no man of ordinary mental capacity could adopt principles and rules of action palpably in violation of the rights of others without self-condemnation.

It must also be remembered that we cannot learn the decision of another man's conscience by his actions. Selfishness, avarice, pride, and all other evil dispositions and passions contend against the pure, benevolent, and just decisions of conscience. We can only be directly certified concerning its operation by our own experience, and thence we learn that, although its decision may sometimes be silenced by the clamour of passion, and at others may be set aside by the fallacies of a proud or a grovelling selfishness, yet the whip and the sting never fail to fall and to pierce when the voice of the inward judge is disregarded. The great broad facts with respect to the operation of conscience are these,—it perceives obligation and duty, it requires obedience to its dictates, and does not fail to bless or curse as they are regarded or contemned.

It is also especially worthy of consideration that the verdict and judgment of conscience are primarily in the name of, and are ultimately directed to, the great Author of our being, and our present Ruler. For although, in most of the cases on which the judgment of conscience is recorded, the action has respect immediately to our fellow-creatures, yet the judgment proceeds on the assumption that, independent of and above

man, we have been placed in relations to our fellow-creatures by a Supreme Authority, and that these relations which He has established we have observed or violated. Hence it does not matter whether our fellow-man be cognisant of our action or not, we are alike self-condemned or self-applauded in the presence of the great King. But this could not be, unless we stood in conscious relation to Him as the rightful Supreme Ruler.

This inward testimony to the existence of a Supreme Ruler is universal. Hence all nations, as far back as we can trace their existence, have had a religion and a God. And the more primitive their condition the more precise and definite their views on the relations they sustain to the Creator and Upholder of all things. During the present century the ancient records of Egypt, of Assyria, and the whole of Mesopotamia have been disinterred and read; researches in Persia have brought to light the condition of the whole Iranian tribes prior to the reformation of Zoroaster, and as its consequence; while the Vedas,—the religious poems of their kindred Indian Aryans,—have been written and translated; and profound researches into the ancient literature of China have unveiled the doctrine and the worship of the Chinese before and since Confucius; and the result of the whole is, that we find in these nations, from the time of their existence as separate and distinct communities, religion,—after the special manner of each,—was the primary and most prominent peculiarity of their combined action.

In Egypt, religion entered into the entire social and individual life of the nation, regulating every private action and requiring a varied and complete virtue, which furnished terms for every Christian grace to the Coptic translators of the New Testament. While it ruled the people, it controlled the King, who was the High Priest of the Supreme God. In Assyria a pure and dominant despotism prevailed, such as we might expect from the successors of him who was a “mighty hunter before the Lord.” In the records of the Mesopotamians, therefore, we see only the king, who undertakes all his works, builds all his cities, fights all his battles at the bidding of the God, his father, and to establish his worship. The Iranians, as might be expected from their nomadic and quiet and contemplative character and habits, returned to the pure and simple worship of the Creator, whose only symbol was brilliant light, and with whom no moral corruption could abide. In Ahurô Magdão they partly beheld the varied, full, and limitless perfection which the Jew saw in Jehovah; hence their morality embraced every devout, individual, and social virtue,

enforced by present divine favour and blessing, and by an everlasting reward. Their Indian kinsmen seem to have made religion the stay and the luxury of their life. So far as we can now see, they had fallen under the domination of an oppressive priesthood, but still they struggled after the free and friendly intercourse which their ancestors enjoyed, and which for many generations was embalmed in the hymns which they continued to sing when the experience they embodied was forgotten. But one thing is conspicuous throughout. Religion was the business of their lives. The Chinese, from their first appearance as a distinct people, had clear conceptions of the existence and present dominion of the Creator, which they retain to this day, although their superstition has peopled the heavens and the earth with multitudes of subordinate or ministering spirits who fulfil His will, so that direct worship is now only paid to the Supreme Sovereign by the Emperor on behalf of the whole empire represented in their solemn services. The Phœnicians surpassed their neighbours in the severity of their worship, offering human sacrifices to appease the anger of God, which shows the strength of their conviction as to the reality of His existence and rule.

We cannot conceive of a religion which does not suppose the dependence of the worshipper upon his God, and also of real intercourse between them; at any rate, so far as the offer of worship by man and the bestowment of benefits by God; and in the ancient nations already mentioned, that God was the Creator, notwithstanding the grouping of subordinates around Him in subsequent times. Nor can this conviction of the existence of a divine Creator and Ruler be ascribed to the infancy and consequent immaturity of these peoples. First, the definite precision of the doctrines forbids such a supposition, and the mechanical, scientific, artistic, and social proficiency of these nations at the time these precise and sharply-cut decisions were commonly held, shows that they were not lucky guesses of the ignorant, but the permanent opinions of thoughtful men.

M. Le Page Renouf, in the *Hibbert Lecture* of 1879, quotes the late M. Emanuel Rougé's mature judgment concerning Egypt, and declares that no scholar is better entitled to be heard on this subject. "No one has called in question the fundamental meaning of the principal passages by the help of which we are able to establish what ancient Egypt has taught concerning God, the world, and man. I say *God*, not the *gods*. The first characteristic is the unity most energetically expressed,—God, one, sole, and only,—not others with Him. He is the only being living in truth: 'Thou art

one, and millions of beings proceed from Thee.' He has made everything, and He alone has not been made. The clearest, the simplest, the most precise conception. . . . The belief in the unity of the Supreme God, and in His attributes as the Creator and Lawgiver of man, whom He has endowed with an immortal soul,—these are the primitive notions."

Dr. Legge, in his *Lectures on the Religions of China*, shows by a careful analysis of the primitive characters by which the Chinese fathers expressed their theological doctrines,—and which he says "puts us *en rapport* with them fully 5,000 years ago,"—that at that remote period their idea of the Deity was Supreme Ruler, "whose providence embraces all." He then proceeds to say that "T'ien has had much of the force of the name Jahve, as explained by God himself to Moses; Tî has represented that absolute deity in the relation to men of their lord and governor. Tî was to the Chinese fathers, I believe, exactly what God was to our fathers, whenever they took the great name on their lips." Zoroaster is supposed to have lived about the time of Abraham, and he taught most distinctly the unity, supremacy, spirituality, benevolence, and righteousness of the Creator and Governor of all. But he only professed to be a reformer, bringing back the people to a primitive faith and practice.

Professor Th. Ribot, in his *Contemporary English Psychology*, page 241, says: "The legislations of Buddha, of Solon, of Lycurgus, of Confucius, of Mahomet, were not the pure creations of their brain. Confucius declares that he follows the traditions of his ancestors. Mahomet states that he is a restorer. Buddhism is born of an effusion of hearts towards charity, tenderness, and the doctrine of inaction. Solon and Lycurgus gave a body of ancient Ionic and Doric institutions. All these men have told the secret to the world." And that secret, according to Professor Ribot, was, that these laws for the regulation of human action were the result of the combined testimony of individual consciences; thus showing that the great legislators drew the material for their laws from the operation of that faculty in man which directly and intuitively recognises our responsibility.

In more recent times, we find the Greeks and Romans in all their public acts besought the aid of their gods, and in their calamities and failures saw the divine wrath, and proceeded by the appointed means to turn it aside. In our own time, we see the most civilised and enlightened nations are the most religious, while the most honourable, virtuous, and intelligent men of those nations are proportionately devout,

and they confessedly derive their principles of honour, and their power of right-doing, from their devotion.

The force of this important series of facts is not invalidated nor weakened by the consideration, that in some of the cases referred to the objects of worship were spurious ; but it is rather strengthened by the fact, that so dominant is the sense of need, and so prevalent the persuasion of the possibility of access to God, on whom we depend, that when all true knowledge of Him was lost, and only false substitutes for the living God existed which could not help, yet, even then, the practice of worship was continued through successive generations of disappointment, all of whom were ready to ascribe the failure to the imperfection of the worship rather than to the impotence or the indifference of their gods.

We have no other peculiarity of humanity equally universal, operative, elevating, or permanent. How can we account for it, but as the expression of a universally-felt need of our nature, prompting to acts of reverence, submission, trust, obedience, and love, mingled with appeals for help, and grateful thanks for past blessings ? We recognise the uneasiness of hunger and thirst as a natural provision, securing the proper nourishment for the body. And we have equal reason to look upon this pressing sense of spiritual need, and the aspiration to one Supreme King, as a natural provision for the spiritual life of the soul.

There plainly can be no insuperable difficulty in the way of intercourse in the highest sides of our nature with its Author, when we find our intellect in constant contact with Him. Many things are at present by our philosophical teachers said to be unthinkable, but far more unthinkable than any philosophical impossibility is the constant sight of operation without an operator. No human mind can think of the one without the other. We not only are able to recognise the operation of the Creator, but we can also learn the modes of His operation ; our only difficulty is in the vastness of His work. We can calculate the actual operative force which the divine volition puts forth in the various members of the solar system, in the attractive force of the different chemical affinities, in the great integrating power of gravitation, in the motion of light, in the capillary attraction energetic in every vegetable tube over the surface of the earth. We have been able to employ the sun to paint our portraits, and the lightning to carry our messages round the world ; while our own work can only be done as we direct to our own ends the force already and continually operating.

Thus we find ourselves in continual contact with the Almighty operator, and, so far as our intellect is concerned, unable to exercise it but upon His work. But this could not be if we were in a condition of necessary and absolute ignorance of God. The cup cannot contain the ocean, but it may be filled from its water. So we are unable to grasp as one magnificent whole the boundless and varied operation of the sustainer of all things, much less can we adequately conceive the breadth of the attributes of His own infinite nature; but we can see in His work skill and power such as we ourselves can exhibit in a less degree. Nor have we any difficulty in seeing benevolence in the boundless and varied life with which our earth is peopled, all the arrangements for which tend to the happiness of the living. In like manner, we find that when men live in any way unnatural lives their action tends to their own weakness and decay, while the violation of all social obligation destroys confidence, so that lying, deception, theft, and every other trespass on the rights of others tend to the disruption of the bonds of society, and require suppression, that full communal life may remain. These facts, which are invariable, as plainly show us the righteousness and truth of the Author of our nature, and the reality of His moral rule, as the physical universe shows us His skill and power. Thus it appears that a knowledge of God, of His moral character, and of our obligation to do His will, may in some measure be learned by his government of us.

But as all such knowledge is rudimentary, and requires long time and patient thought, as well as large range of observation, and, after all, is only of authority to the individual who has thought it out for himself, we require some more certain, extensive, and authoritative teaching, that we may from the first live natural lives,—that is, lives in accordance with the requirements, capabilities, and obligations of our nature. This need becomes more imperative from the fact that we begin life in a condition of total ignorance, and have each for ourselves to acquire such knowledge of external things as will enable us to prolong and improve our life in this world; and this in many cases so engrosses the attention as to leave no room for anything besides.

Not only is there nothing in human nature to prevent such a revelation of the divine will, but our relations of subordination and dependence,—the grounds of responsibility,—make it likely that such revelation will be granted, and that, in some way, certain and conscious intercourse with the Father of our spirits will take place. We know of no being but God with whom we as men can have free interchange of

thought and emotion, while, as we have already seen, if we act effectually, we must act after His manner. There is, therefore, no reason in the nature of things, in what the universe teaches us of God, nor in our own nature, to make such intercourse unlikely, but everything to make it extremely probable.

No man of ordinary intelligence would erect a large manufactory, furnish it with machinery and all material necessary for the work to be done, and then commit it to the charge of totally ignorant people to conduct the operations, and leave them without supervision. Unless he declared his will with respect to their action, he could not expect his plans to be carried out, and the *employés* would certainly not be to blame for the failure. How much more is it impossible for the Maker of all things to bring into existence a race of intelligent agents, and place them at the head, and in possession, of a world full of His creatures of inferior nature, and after all leave them without information concerning His will and purpose towards them. Nor can we conceive of His having created a race so richly endowed with emotional capacity, and after all leaving them without a knowledge of Himself, the only object capable of calling forth the full strength of these emotions; particularly when the emotion is not a separable accident of the nature, but is woven into its entire texture, influencing every volition, and prompting to every action.

The force of such arguments as the above, which appeal to reason and common sense, is frequently evaded by bringing against them the terrible charge of being anthropomorphic. The alarm is created by the use of the long Greek word; if it were simply translated, and the harmless word *human* took its place, its power to dismay would depart. There is wonderfully terrific power in long Greek words. And, when we observe the solemn awe with which the charge of being anthropomorphic is generally brought, we cannot help recurring to Austin Caxton's adventure with the wild bull, which he thus describes, "Luckily I had the umbrella, and I sprang it up and spread it forth in the animal's stupid eyes, hurling at him simultaneously the biggest lines I could think of in the first chorus of the *Seven against Thebes*. I began with '*Eledemnas* PEDIOFLOCTUPOS'; and when I came to the grand howl of 'Ιῶ, ἰῶ, ἰῶ, ἰῶ, the beast stood appalled as at the roar of a lion. I shall never forget his amazed snort at the Greek. Then he kicked up his heels and went bolt through a gap in the hedge." In like manner, when the grave charge of being human is brought in Greek, instead of boldly affirming it, some who know better, appearing to think that there must be some evil lurking under

the outlandish word, begin to defend themselves against anthropomorphism.

Plainly we are incapable of anything which is not human ; our thoughts, emotions, and actions are all human and nothing but human. But the gentlemen who bring this charge do so avowedly for two reasons. First, that all such modes of thought are inadequate to produce any knowledge of God ; and, secondly, that they are derogatory to the divine nature. But it must be remembered that their God is not the God of common men. He is not the Creator and Sustainer of the universe, but an abstraction of the human intellect, who is presented to us as the Absolute, the Unconditioned, the Infinite ; each and all of these and similar terms conveying the notion of an existence without attributes, without relations, without thought, without action, and therefore, to all normal human thought, without being. And this they virtually acknowledge, in declaring that all anthropomorphic,—that is, human,—modes of thought cannot apply to him.

Nothing can more clearly show the non-natural, and, therefore, worthless character of such speculations, than the acknowledgment that human thought cannot apply to such a conception any attribute of reality, as, indeed, it cannot. How can we conceive of an infinitude which fills immensity, and yet is nowhere ; which comprehends all excellence, and yet has no particular virtue or power ? Such a thing is simply a human creation, and the creators find their production so full of contradictions and absurdities, that they are unable to present it in an intelligible form to others. But instead of acknowledging their failure, as normal human modesty would suggest, they repudiate human language and human thought, because they reject the monstrosity. But let us never forget that the Absolute, the Unconditioned, the Infinite of modern philosophy has no existence but in the minds of the philosophers themselves ; and there we may leave it, without any alarm for the consequences.

But, while they amuse themselves with abstractions which are delusive and perverting, let us remember the Living God, our Maker, and the bountiful Donor of our blessings. And while we keep our eyes open to all the operation of His hand in the physical sphere of His work, let us not fail to mark the effects of human action under His government, both on the actors themselves and on others also. Thus we shall learn much concerning His moral character, which will instruct and help us in our endeavours to walk uprightly before Him. But the more we study these questions, and the greater pro-

ficiency we make, the more deeply shall we feel that some further knowledge of Himself and the relations in which we stand to Him is necessary for us.

We have already seen that we can only think of the Creator according to those laws of thought by which we think of other persons and things. It, therefore, follows that any communication from Him must be brought down to the human level. There seems to be no difficulty in this, inasmuch as all His work in the material universe is open to our comprehension. But here a question arises,—How are we to ascertain that the communication professedly coming from Him does really so come? If it be merely local, temporary, or individual in its application, all that can be considered necessary is the assurance to the person to whom it comes that the speaker is God. No improbability, no difficulty can possibly exist in any communication of the Creator with His creatures. Several such special, individual revelations are found in the Scriptures of the Old and the New Testament. Such communications, however, cannot meet the general need, nor would solely individual revelation be in harmony with the Creator's mode of operation in material and secular things. A law for the race must be publicly proclaimed, and there must be unquestionable evidence that He who speaks is divine, or the speaker must be attested as a divine messenger. We cannot suppose that less than this would be done by God, and certainly less ought not to be accepted by man. Otherwise we might be following lying spirits, and not the Spirit of God. With such assurance we may rest content.

What, then, are the facts with respect to the Christian revelation? We find them cluster around two persons,—Moses and Jesus of Nazareth. Moses is our authority for the records of all preceding revelations; we must, therefore, look for an attestation of his character and office, of equal certainty to the importance of the position which he occupies with respect to the world. We see a personal call to his important office in the appearance of God to him in the burning bush, in which he has an assurance that the Creator would appear in the government of His people, in all the plentitude of His infinite, necessary, and eternal being, of which He gave a pledge in assuming the new name Jehovah. This must be considered as the pledge, the promise of all that followed. This, however, immediately concerned Moses alone, and was the assurance to him of that full divine revelation which by him, in its continuous progression, should manifest God in the flesh. This was necessary to give him the confidence needed for the special and dangerous work he had immediately to do.

The pledge was redeemed; Moses passed through all the danger and difficulty of his intercourse with Pharaoh, not only without harm, but with such improvement in courage, knowledge, and political conduct as fitted him to lead the children of Israel to freedom and independence.

But the personal revelation to Moses was only the prelude to such public and general manifestations of divine power, as proved that the Sender of Moses was none other than the Creator and Upholder of all things. Only he who possesses, and can use as he pleases, the matter, the force, and the life of the universe, could have inflicted the plagues on the Egyptian king and nation. That they really occurred as recorded is evident from the deliverance of Israel from Egyptian bondage, and from the profound place this wonderful deliverance occupied in the sacred and national literature of Israel. But these displays of the divine presence and authority, were but the beginning of that wonderful and diverse fatherly goodness of God to Israel, which was intended as a pattern and a pledge to the whole world of like fatherly care and love. See their immediate direction by the pillar of cloud and of fire, so that they stirred not but as the Lord led them; their daily food not failing, but neither sown, reaped, ground, nor kneaded by themselves; and, finally, at the time declared, their entrance on and possession of Canaan. These were all palpable facts, which it was impossible surreptitiously to foist. The memorials of them were preserved in the Feast of the Passover, of Tabernacles, and in the rod of Aaron and the pot of manna, which were preserved in the Tabernacle and the Temple, till the destruction of the latter by Nebuchadnezzar.

To the whole community, the infant nation, thus prepared, the Law was proclaimed. But, as might be expected for so important a transaction, special and imposing preliminaries and accessories were appointed. Moses was called to the divine presence, and from thence sent back to the people to say: "Ye have seen what I did unto the Egyptians, and how I bare you on eagles' wings and brought you unto Myself. Now, therefore, if ye will obey My voice indeed, and keep My covenant, then ye shall be a peculiar treasure unto Me above all people: for all the earth is Mine; and ye shall be unto Me a kingdom of priests, and a holy nation." To this appeal "all the people answered together, and said, All that the Lord hath spoken we will do." When Moses carried this reply, he was sent back to sanctify them by the appropriate sacrifices and cleansing; their clothes also were washed, and on the third day the whole congregation, in a state of physical

and moral purity, came to the front of Sinai, that they might hear the Lord proclaim His law. "And the Lord came down upon Mount Sinai, on the top of the mount. And Mount Sinai was altogether on a smoke, because the Lord descended upon it in fire: and the smoke thereof ascended as the smoke of a furnace, and the whole mount quaked greatly." From the fire, and the thick darkness, the Lord spake the Ten Commandments, in the hearing of all the people.

The whole scene was imposing and awful, so that "the people removed and stood afar off. And they said unto Moses, Speak thou with us, and we will hear, but let not God speak with us lest we die." Thus it is evident that the whole transaction was, to the assembled Israelites, an awful reality. And, when we consider the circumstances, we see that there was no possibility of simulation. None but the Creator and Possessor of all things could have made Sinai to smoke and quake, and from that fiery furnace have uttered the Law. The moral impossibilities are equally apparent. How could a gigantic deception have been joined on to the Egyptian plagues, the dividing of the Red Sea, and the descent of the manna? Could anything but reality be associated with the utterance of that Law, which is the basis of all sound human legislation, and which to this day has full force in all the most civilised and intelligent nations of the earth? It is impossible also that the morality of a nation could come out of a lie, either spoken or acted, and especially such a full and complete morality as the laws of Israel enjoined. There is also this important collateral evidence of its reality. The descendants of this generation who witnessed the giving of the Law, in all their neglect of it, in all their idolatrous apostasy, never once pleaded the want of authority in the Law itself as an excuse for their sin. And their descendants, so wonderfully preserved as a distinct people to this day, acknowledge the Decalogue as the Law of the Lord. All these assurances, however, are no more than might have been looked for in a declaration of the divine will so important and wide-reaching.

The reality of the scenes of Sinai being assured, let us look at the significance of this revelation. We have here only one view of the Creator,—it is that of King. He does not proclaim anything concerning His own nature, nor satisfy a single human speculation, nor even declare the relations in which He stands to His creatures as the basis of His law; but, taking as an unquestionable and fundamental fact the rightful subjection of all men to Himself, He simply declares His will. And, although the law was given to Israel as the

condition on which alone the special privileges of being a peculiar treasure, a kingdom of priests, and a holy nation could be enjoyed; yet, at the same time, He claimed the right to the whole earth. Thus from the mouth of the Lord himself we learn our responsibility to Him and our obligation to do His will.

This act of legislation was one, by it the nationality of the Israelites was secured, and only the details of social law and the administration of the law remained to be secured. These did not fail, and in them that full revelation of divine perfection, which the name Jehovah promised, was accomplished. But this economy which secured such abundant good to Israel, was brought about by the establishment of most perfect and direct responsibility to the Lord, who was not only their God, but their King. And, although by His permission they at length had a human monarch, that monarch was merely the divine vicegerent. They were, therefore, commanded, while yet in the wilderness, that at the time they should say, "I will set a king over me, like as all the nations that are about me; thou shalt in any wise set him king over thee whom the Lord thy God shall choose." This was actually done in the case of Saul and David, and these kings and their successors were simply intrusted with the administration of divine law. Their legislative authority extended only to proclamations of an individual and peculiar character, which adjusted the general provisions of the Mosaic Law to special cases. But not one clause of the original Law could they abrogate or amend. In accordance with this economy, the king was consecrated to his office by an anointing, which was the outward symbol of the gift of the Spirit of God, as the qualification for the efficient fulfilment of the duties of His office, and, when both king and people departed from the law, God Himself inflicted the punishment due to their transgression, as He was their deliverer and helper in all times of their obedience.

In this continued exercise of direct rule over Israel we have repeated proofs of the presence of the Creator and Upholder of all things. When they had grievously departed from the law, and had, contrary to express prohibition, introduced the idolatry of the Sidonians into Samaria, and worshipped Baal instead of the Lord, He withheld rain from them for three years and six months, so that famine was sorely felt in Samaria and the whole country; nor was the infliction removed until the people again declared the Lord to be God, and the 450 prophets of Baal were slain. The means also by which this reformation was effected could only have been used

by Him in whose hands are the forces of the universe. The prophets of Baal in vain called upon their god from morning till noon, and till evening approached, and cried and cut themselves, and leaped in desperation on their sacrifice, but no answer came, and no fire descended. But, when Elijah appealed to the Lord, to show all the people that he had done all in obedience to His word, and thus turn their heart back again to Himself, "then the fire of the Lord fell and consumed the burnt sacrifice, and the wood, and the stones, and the dust, and licked up the water in the trench." Here was a work which only the Supreme Ruler could have done; and, like all which He did in the government of His people, it was done under circumstances which rendered mistake or deception impossible. A public challenge had been given, the prophets of Baal and of the groves, 850 in all, had been summoned, and all Israel had been collected to witness the result of the contest. Most important national interests were involved; an entirely new departure, or a return to the old paths, must be the result of that day's trial; their eyes were open, their interest was excited, their attention fixed, and the result was a national cry, "The Lord he is the God! The Lord he is the God!" If any transaction ever was real, and certain, and unmistakable, this was, up to the unanimous and universal verdict.

Another act of direct divine rule occurred a few years after the above, in the kingdom of Judah, which demands consideration for our present argument. Jehoshaphat was informed that a great multitude of Moabites, Ammonites, and others was coming against him in Jerusalem. He knew that his force was insufficient to meet them, but he believed in the Lord his God, proclaimed a fast, and gathered all Judah to ask help of the Lord. Then, as the voice of the whole congregation, he uttered the following prayer: "O Lord God of our fathers, art not Thou God in heaven? and rulest not Thou over all the kingdoms of the heathen? and in Thine hand is there not power and might, so that none is able to withstand Thee? Art not Thou our God, who didst drive out the inhabitants of this land before Thy people Israel, and gavest it to the seed of Abraham Thy friend for ever? . . . If when evil cometh upon us, as the sword, judgment, or pestilence, or famine, we stand before this house, and in Thy presence (for Thy name is in this house), and cry unto Thee in our affliction, then thou wilt hear and help. And now behold the children of Ammon and Moab and Mount Seir whom Thou wouldst not let Israel invade when they came out of the land of Egypt, but they turned from them and destroyed them

not; behold, how they reward us, to come and cast us out of Thy possession, which Thou hast given us to inherit. O our God, wilt not Thou judge them? for we have no might against this great company that cometh against us; neither know we what to do; but our eyes are upon Thee."

When the prayer was ended the Spirit of the Lord came upon a Levite in the midst of the congregation, who, under this divine impulse said, "Harken ye, all Judah, and ye inhabitants of Jerusalem, and thou king Jehoshaphat; thus saith the Lord unto you, Be not afraid nor dismayed by reason of this great multitude; for the battle is not yours, but God's. Ye shall not need to fight in this battle; set yourselves, stand ye still and see the salvation of the Lord with you." On the morrow, when they went forth at the divine bidding to behold the invaders, they found that the Lord had turned their treachery to Judah towards one another, so that Moab and Edom slew the people of Seir and then turned their swords against each other until all were destroyed; and the number was so great that it took them three days to collect the spoil.

This quotation has been made because this piece of national history establishes every position that has been affirmed in the preceding argument. There evidently was free and conscious intercourse with God. He was addressed by Jehoshaphat as God in heaven, and as ruling in all the kingdoms of the heathen. As their King they appealed to Him for help, and by that power which He, as the Maker and Upholder of all men was able to use, turned the swords of these foes of Israel against each other, and thus delivered His people who obeyed and trusted in Him, while He, in the same act, punished, by means of their own wickedness, those who had so plainly violated obligations palpable to all.

The two cases selected are only peculiar in this respect, that they were of that public and general importance which precluded the possibility of mistake or deception; and they have been taken, not as parts of a divine revelation, but as portions of authentic history. And the history of which they are parts is full of similar divine interpositions in the maintenance of His law, both to reward and to punish.

And it must be remembered that, while this rule was immediately over Israel for their good, its ultimate intention was as wide as the race. At the time Abram was chosen as the father of the Church, some special interposition was necessary to prevent the entire and universal departure of men from the Creator and Sustainer of all, as the one true and living God. Other reformers, among the Iranians and

Egyptians, were employed in recalling men to a spiritual worship and a pure and righteous practice; but they were members of nations already in existence, and hence were not able to perpetuate through the whole nation a reformation which they could not extend to all of their own time; therefore it was that the Lord chose Abraham, and of him made a nation, because the Lord "knew him, that he would command his children and his household after him that they should keep the way of the Lord, to do justice and judgment."

In this nation, therefore, trained from the time of its great father in fellowship with God, the Creator determined to perpetuate the remembrance of Himself by His continual operation, to chastise and to bless, until He should complete His revelation in the incarnation of His Son. Thus, through fifteen centuries of idolatry, with its consequent pollution, injustice, oppression, and debasement, He preserved among His own people the knowledge of Himself as the living God, the God of the spirits of all flesh, and the practice of righteousness and truth to men, which however defective through their unfaithfulness, was far in advance of the rest of the world. There was also established an outward and visible embodiment of divine rule, which has expounded the nature of that rule for all time as no didactic explanation could.

Indeed, everything we know of God we know from facts, and we see how hopeless every other method is in the barren results of philosophical speculation, which, after 2,350 years since the birth of its Grecian branch, has not produced a single proposition concerning the divine nature and government which men generally are able to accept; and, however correct the conclusions arrived at may be, coming only from the cogitations of an individual mind, and that generally abnormal, they entirely lack authority, and therefore are never universally received. The history of philosophy is a history of alternations, and from Thales to the present time the propounding of any philosophic doctrine in one age has been the guarantee of a contradictory doctrine as its chronological successor. At this time no system of philosophy commands universal assent; so that it is evident philosophy can never be the source of practical principles,—can never be the instructress of humanity in the every-day business of life. But the clear and explicit law of our Maker, illustrated by the examples of his continued rule, meets our entire need, and is capable of immediate and intelligent application. Thus it is, that by the records of divine government a child may become an expert in salvation.

This condition of things,—for our results are the results of facts,—shows that we are brought into immediate contact with our King, and are able to render as true and immediate obedience to Him as to any human monarch ; and it is specially worthy of remembrance that, when the Son of God became incarnate and appeared as the Saviour, He commenced His ministry by declaring that the kingdom of heaven was at hand. He was sought by the Persian Magi as he who was born king of the Jews, and His entire work and influence was described by John as the coming of the kingdom of heaven. The title which Pilate in derision put on the cross was true, not only with respect to the Jews, but to all people. Because “He humbled Himself and became obedient unto death, even the death of the cross; therefore, God also hath highly exalted Him, and given Him a name which is above every name; that at the name of Jesus every knee should bow, of things in heaven and things in earth and things under the earth; and that every tongue should confess that Jesus Christ is Lord,”—that is Ruler or King,—“to the glory of God the Father.” Thus it appears that the establishment of an economy of salvation does not relax the bonds of authority nor contract the range of responsibility, but intensifies both by transferring the dominion to His hands, who, by reason of His death, has spiritual power to recover the disobedient and bring the rebellious into subjection.

We can only conceive of salvation as recovery,—as deliverance from the power and practice of sin. And this, according to the Christian scheme, not only involves the breaking up of the power of habits of disobedience, but the mastery over all sinful inclinations and dispositions, and the establishment of reverence, filial fear, submission and love to God, as the ruling principles of the soul. But this is a condition in which a sense of responsibility becomes actual and active, to the extent of directing the whole life. But this subjection, when most perfect, is felt to be simply natural. No individual power is suppressed or weakened, no social obligation is forgotten or violated; all find scope, and all operate without friction or pain, because all is felt to be right. And in this testimony of the conscience is a strong, honourable, abiding joy, most sustaining and strengthening to the soul, which now feels that the only means of increased honour and strength, is a more perfect subjection to the divine King, and obedience to the law of the spirit of life written on the heart.

But, if the above be the result of the recovery in those who experience the salvation of the Gospel, then it is evident responsibility to the Author and Sustainer of our nature is a

primary and inseparable quality of the nature itself. And this receives confirmation from the fact that no other impulse is capable of developing the moral, which is the highest side of our nature, into heroic virtue, or of adorning the life with all that is true, honourable, just, pure, lovely, and of good report. One in whom this excellence is found more nearly approaches the ideal of perfect manhood than any other. Consequently, the power by whose operation this state is produced, is most peculiarly and intensely human. But that power is a profound sense of responsibility in intense and continued operation.

If we look at the contrast, that is, at a man who has no sense of responsibility, having suppressed every call to duty and all remembrance of benefits from others, and who now lives as though he were perfectly independent, we see one without a motive to virtue, and who can only act in mere concert with others from some individual and temporary interest of selfishness. A family, a city, a nation of such isolated units is impossible ; and yet the family, the city, the nation, are integral and necessary parts of complete humanity. Union in purpose and work is impossible among individuals who have no sense of responsibility ; but without such united purpose and action no cultivation of the mind, no improvement in outward conditions, no perpetuation of the race, and no life,—but in the lowest barbarism and privation,—is possible. Such a state of things is not the intended, as it is not the actual, condition of humanity, but it is the necessary consequence of the existence of beings with our endowments without responsibility. Had such been created, it would have been impossible to awaken a sense of responsibility afterwards ; and, had it been possible, who possessed the right to interfere with the Creator's work, and who could possibly have the inclination to impart such a gift to man ? Thus, by the necessity of nature, we are driven to the conclusion that man is liable to answer to his Maker for every endowment which has been committed to his trust.

In discussing the question of Human Responsibility, we are bound to give all possible attention to the declarations of the divine will, and to all divine acts which have relation to this side of our nature. And this obligation arises from the fact that none can know the nature so well as its Author, and that He can have no purpose towards it but its improvement to the highest limits. Taking this as our rule of procedure and judgment, we cannot fail to see that, from the beginning, there has been a continual effort to awaken and perpetuate

a sense of dependence for the entire need of our life. And the only conclusion to which we can come, from this continuous divine action, is that a perpetual sense of dependence that will call forth a filial trust, hope, confidence, and love, which will open the entire nature to the fatherly soothing counsel and strength of its Author, is the true normal condition of man. Nothing in divine action leads to the conclusion that we have to do with a rigid destiny, or a harsh despotism, but only with the heart of the Father of our spirits, who yearns over us to reclaim us to Himself, not for His advantage, but for ours. For this reason only He fills the path of apostasy and sin with briars and scorpions, but makes all which lead to His fatherly heart ways of pleasantness and paths of peace.

It is only in this manner that we can consider that most wonderful divine intervention in human affairs,—the Incarnation of the Son of God. That the Maker of all things should condescend to take our nature in its feebleness and suffering into union with Himself, so as to constitute one person, and to remain forever our brother and the Almighty's fellow, is a manifestation of care for, and interest in us, which is wonderful beyond all thought, and which, but for the abundant proof of its reality, we could not believe. And the wonder is increased by the fact, that the present and perpetual administration of the divine government, which is in His hands, is as truly tender and brotherly as was the original impulse which prompted Him to love us, and give Himself for us.

The individual government of the Saviour over those who receive Him is most perfect, springing out of a union so intimate as to be only properly described as "Christ in you," "Christ dwelling in the heart," the counterpart of which is a most perfect submission to Him in all things, which the Apostle Paul describes thus: "Whether we live, we live unto the Lord; or whether we die we die unto the Lord: whether we live, therefore, or die, we are the Lord's." And again, after this manner: "Whose I am, and whom I serve"; and "I live, yet not I, but Christ liveth in me." In this complete subjection, however, there is no coercion, the only constraint is the constraint of love. In the love of Christ they are rooted and grounded, so as to be able to apprehend its breadth and length, and depth and height, and so to be filled with it, unto all the fulness of God. This causes such persons to be followers of God as dear children, and to walk in love as Christ loved them, and gave Himself for them. An emotional bond of this strength cannot fail to bring the

whole nature under subjection. But these bonds are willing bonds, being only a response to the love of Christ, which surpasseth knowledge; and the law which we obey, although perfect in its range, extending to all actions, words, dispositions, and thoughts is, after all, the perfect law of liberty; so that, in this condition of perfect subjection, the individual will and purpose are most fully accomplished.

We cannot look upon this peculiarly fatherly rule of God as anything else than the complete accomplishment of His original purpose with respect to man, because it has been brought about by the atoning and mediatorial work of the God-man, who united in His own person the two natures, as the means and the type of the union between God and men above described. Thus, we are taught what the Creator intended for man, and from the extraordinary means used to accomplish it, when imperilled by a general apostasy, we learn the all-but infinite importance attached by Him to its accomplishment.

We cannot fail, however, to see, from the complete series of divine acts in the government of men, that in placing the whole race in a condition of responsibility, and in implanting an indelible sense of it in every human soul, there could not be, as the final purpose, a mere assertion of authority. We must look beyond the authority to the consequences of its exercise in those who submit to it. And here at once we see a benevolence which is equal, in its purity and strength, to the fountain whence it sprang and to the channel by which it has flowed to us. The immediate effect of this submission, is the establishment of a condition of conscious peace with God, which is the means and the authority for a continuous friendly intercourse between the Creator and His creature; maintained on the part of the creature by grateful thanks for good already bestowed, a worship of submission, hope, love, and trust, and prayer for present and continued acts of fatherly love and blessing. In these exercises there is neither vagueness nor uncertainty, as there is no doubt concerning the assurance of love, the excitement of courage, hope, and faith, and the infusion of new life into the soul from the Lord. In this intercourse, under a divine illumination, the glories of the divine nature, as shown in the records of His providence and grace, are more distinctly and more fully seen, and thus an impulse to higher devotion and more perfect virtue is given. In this manner, beyond the peace and rest from which it starts, the intercourse with God is the means of increased vigour, righteousness, truth, purity, and goodness.

There is, however, a joy in this fellowship which arises

directly by the operation of the Spirit of the Lord, and which is augmented by the consciousness of all the friendly and gracious relations in which, by the effected reconciliation, we stand to our heavenly Father, which, in the happiness and strength it produces, surpasses all other joy, and is declared to be "unspeakable and full of glory." But it must be always remembered that the first and largest element of this joy is the sense of reconciliation, that is, the consciousness that the condition of rebellion has ceased, and that the subject of the joy has been brought into a state of harmony with and subjection to God. Thus this richest donation of divine grace shows that a condition of actual submission to God is not only perfectly proper and natural to man, but that it is the highest and happiest condition to which he can attain.

This is evidently the true view of the end and purpose of human responsibility, so far as our Maker himself has shown it; and we cannot conceive of any other result but the most perfect development of our nature in all its beauty and strength, as the consequence of full acquiescence in the divine purpose, by unlimited subordination. This side of the question, however, is generally lost sight of, and it is discussed as though the subordination was claimed by an alien authority for its own selfish purposes. This course is all the more strange when we remember the essential peculiarities of our nature in this life, as, that we are capable of boundless knowledge, and equally of unlimited mistakes; that we begin life in total ignorance, and, to perpetuate it, are compelled to consider its immediate need and supply it. So far as the life of the body is concerned, we cannot go far wrong without immediate check; and, in all metaphysical speculation, because of the remoteness and uncertainty of its results, a mistake is not of much moment; but in the cultivation or restraint of the moral side of our nature, which rules our practice, and so affects others also, mistake or perverseness is of most serious consequence to our own character and to the happiness of others.

There is also this peculiarity about all failure in this side of our nature; as it can only take place by the determination of our individual will, so there is special unwillingness to retrace any false step, and thus a course of continuous deterioration and mischief follows from a first step, which only diverged slightly from the path of uprightness. Is it not likely, therefore, that He who has so richly endowed us in every other respect will, with equal care, prompt, restrain, guide, and stimulate us in the cultivation of those dispositions, and in the

pursuit of that course of life which will enable us to obtain the full measure of benefit from His primary gifts?

That this is the tendency of the divine government of man, is plain from the use to which individual responsibility is put. We are not so much called to answer for the number of prayers we offer, of psalms we sing, or of oblations we present, as to how we act to our parents, children, masters, servants, neighbours, friends, or enemies; in short, to all men, in so far as our action touches them. All who are brought into the fellowship of Christ walk as He also walked; that same mind of righteousness, pity, purity, truth, and benevolence which was in Him is also in them, so that they are fruitful in every good work. They are required not only to be blameless and harmless, the sons of God without blemish, in the midst of a crooked and perverse generation, among whom they are seen as lights of the world, but also to remember that "our great God and Saviour, Jesus Christ, gave Himself for us, that He might redeem us from all iniquity, and purify unto Himself a people for His own possession, zealous of good works." In all the Epistles of the New Testament, the fruit of faith is shown to be the fulfilling of every social duty. And there can be no question but that the finest examples of righteous, pure, true, and benevolent living have been the fruit of that thorough submission to the Saviour, which Paul expressed as, "Christ liveth in me." Without such works, faith is declared to be vain and dead.

It is evident that, as the number of such persons increases in any community, the various forms of iniquity which too frequently appear in the intercourse of men to the dishonour and degradation of the perpetrators and to the mischief of others, must diminish, and, when they are universally prevalent, must entirely cease. Then all the misery, and more than half the sorrow of life, would end, while the honour, pleasure, and strength of such a community would constantly increase. In such a state, however, there would be nothing beyond a purely natural life, that is, a life in harmony with our relations to our Maker and to our fellow-creatures. But there is no moral power capable of producing this state, but such a full submission to God as is comprehended in our accountability to Him.

While we are without limit accountable to God, we see that a subordinate and secondary accountability runs through all our relations to others. Children are liable to answer to their parents, and without this subordination it would be impossible to train them to the duties of life. No compact of any

kind can be made without bringing each of the parties under obligation to fulfil severally his part of the contract. All magistrates are responsible to the head of the state for the administration of the law, and all private persons are required to keep their practice within the prohibitions of the law under which they live. No man is at liberty to touch the property of another or in any way to damage his interests. There cannot be a school, a factory, or an army, but you have subordination, and consequent responsibility, running in an unbroken chain from top to bottom. In fact, no human organisation can exist without it, and this comes from no arbitrary superimposed law, but by necessity of nature. Man must be unmade, and re-made after another pattern, if he could engage in combined action without responsibility ; and without such action the race must die out.

Further discussion as to the accountability of man to man is unnecessary, as it is impossible to escape from it, communal life demanding authority and restraint everywhere. We may, therefore, review our conclusions, and so come to a logical result as a guide to practice.

We have seen that we are dependent on others for our life,—first, on our parents ; but, as they also are equally dependent on theirs, we are led on to the first Cause and Giver of human life. No man can make himself now, nor could the first man. From our bodily structure, and from the faculties and capabilities of our mind, it is evident that we cannot have come into being by the mechanical or chemical action of matter, nor from both combined, but that our Maker must be a Being of supreme intelligence and power. It also has appeared that we are equally dependent on Him for the continuance of our life ; not only as His will prolongs or cuts it short, but as His providence continues the conditions necessary for its preservation ; and that we are under His rule absolutely, as to our body and our means of operating by it on the world without us ; being unable to depart from the course prescribed for us without injury or destruction. The limits of our ability in this direction are narrow, well defined, and invariable. We are also evidently under a similar invariable rule as to our moral action ; so that we can indulge in no vice without deterioration in honour and strength ; nor can we trespass on the rights of others, but we bring ourselves under the restraint and chastisement of the laws which the community imposes as a necessary bond of union and protection.

But we have capabilities and wants which the material universe and our fellow-men cannot fully meet or develope. Thus we have seen that from the beginning of human history, we have evidence that men, by a universal intuition, have aspired after fellowship with their Maker,—not the attainment of mere abstract knowledge, but a true communion of thought, emotion, and action; and that they have so far found what they sought, as to persevere in the practice till now, when religion is more prevalent and more powerful than ever before. The Creator, who has made the eye for light, the atmosphere for breath, and the lungs for breathing; who has given us discernment, and spread the universe before us as an open book for us to read; and who has so made and ordered all our bodily members as to suit the conditions in which He has placed us, cannot have given higher faculties than sensation and intellect, to leave them without a possibility of exercise, by failing to respond to the faculty which He has given for no other purpose, but as a means of access to Himself, and the attainment of knowledge concerning His modes of operation, in cases which supply no other data from which to start our cogitations.

This prepared us to look for direct and unquestionable fellowship with the Creator, nor were we disappointed. We have records of such fellowship from the beginning of human existence; and, as though on purpose to remove the possibility of doubt or mistake both as to the fact and to the nature of the intercourse, He has connected the most perfect display of His moral glory and of His condescension to man with the government of a nation, in which He maintained His own law by an effectual administration all the way through, showing that He who was king in Israel was the ruler of the world, by employing the substance, forces, and life thereof as His instruments of government. By the same effectual rule he has preserved this people distinct from all others, so that, although for eighteen centuries they have been without a country, and scattered as aliens over the face of the earth, yet they are nowhere absorbed, but retain their identity still; but, wherever they go, they carry with them as their Magna Charta the records of that divine government which extended through 1,400 years, although they testify to the disobedience and rebellion of their fathers, and declare that their continued unbelief and sin are the cause of their own present alienation; and as these records were more scrupulously made, are more complete, have been more carefully preserved, and enter more fully into the national life than those of any other people, so they possess the greatest historic value. To deny them would

be to invalidate all history. We have no stronger assurance that Cæsar invaded Britain than that God brought the Israelites out of Egypt and through the Red Sea. We have no better proof of the result of the Battle of Agincourt than we have of the overthrow of the Ammonites, Moabites, and the people of Mount Seir by their own swords.

Thus, by a long series of carefully-recorded events, we find the reality of a divine rule of man is attested, and in our present condition we have abundant proof that it is neither relaxed nor restricted. We cannot remove our body from the operation of the physical laws of the Creator, nor can we take our soul out of the control of His moral law, or prevent a single action of our life from recording its moral verdict in our nature itself. To submit to this rule insures our highest good, because it is that of the Father of our spirits, who can have no purpose adverse to us, and because it enlists the authority, power, and wisdom of the Author and Ruler of the Universe for the accomplishment of our desires and the improvement of our nature. But to resist and rebel is to oppose our highest interest, and can only result in degradation and ruin: "Let the potsherd strive with the potsherds of the earth," but "woe unto him that striveth with his Maker."

The CHAIRMAN (Mr. W. N. WEST).—Had the author of the paper been present instead of in the southern hemisphere, it would have been a great pleasure to have accorded him in person a vote of thanks for having favoured us with so interesting a paper, and I am sure all feel that such a vote should be accorded. We have to thank Mr. Dent for his kindness in reading the paper, and we shall now be happy to hear any remarks that may be offered.

Rev. J. J. LIAS, M.A. (in responding to a call), said, I feel that I am in the position of an advocate who has no case to argue against. I regard the paper as an extremely able one. What strikes me with regard to the papers read before this Institute as a rule is, that it does not seem desirable for us to indulge in anything like microscopic criticism as to an expression used here, or a remark made there, which might either have been improved, or which might have been omitted. We ought, I think, to have regard to the whole drift of the paper, which, I think is, in this case, one likely to advance the cause we all have at heart. (Hear, hear.) It certainly seems to me that the points the author has brought under our notice are well deserving of consideration, and that this is especially the case with regard to one or two of the matters he has discussed. A few days ago I happened to be present at the reading of a paper in the Divinity School at Cambridge, written by Professor MacAlister, a learned man of science, who has devoted himself, among other things, to the study of Egyptian antiquities. The paper he then read was a very remarkable one on the "Ritual of the Dead," as employed in the early Egyptian religion, and

it appears to me that there is one point which the author of the present paper has not brought out with sufficient distinctness, but which the facts actually prove to have been the case, namely, that the further we go back in the history of these ancient nations the more clear it appears to be that the religious principle was originally based on the monotheistic idea. It seems to me that in those early times the primary spiritual ideas connected with religion are more clearly displayed, and that, especially in the case of Egypt, the further we go back the more unmistakably do we find that, just as the Egyptian architecture was more pure and perfect in the earliest periods, so were the religious ideas of the Egyptian people of a purer and more perfect nature. The same remark will apply to the Assyrian religion; but, as to the Persian and Chinese religions, I can hardly speak of them because I have not studied them. I think that the more we study the points set forth in this paper the more does the author, who is so far removed from all intercourse with modern thought and from the opportunities afforded by the libraries and other aids we have around us, appear to demand our sympathy and admiration for having so ably thought out and discussed these matters. There is one point on page 13 of the paper which struck me. The author says:—"The force of this important series of facts is not invalidated nor weakened by the consideration that in some of the cases referred to the objects of worship were spurious; but it is rather strengthened by the fact that so dominant is the sense of need, and so prevalent the persuasion of the possibility of access to God, on whom we depend, that when all true knowledge of Him was lost and only false substitutes for the living God existed, which could not help, yet, even then, the practice of worship was continued through successive generations of disappointment, all of whom were ready to ascribe the failure to the imperfection of the worship rather than to the impotence or the indifference of their gods." The author here puts in a striking form the argument that human nature cannot do without a power outside of and superior to itself, as Matthew Arnold says, "A not-ourselves that makes for righteousness." We cannot do without something beyond ourselves which will help us to fight for the right; we are bound to acknowledge the necessity for an appeal to that Power for whose aid we feel, as poor human creatures, we stand in need. On page 15 the author travels over the same ground to that which I have traversed in a paper read before this Institute, namely, that we are not to look upon God as a mere abstraction of the human intellect, or a creation of our own minds, but as a concrete Being, the source of all life, a Being outside and beyond ourselves, who has created us, and who brought the whole world into existence. There is another point, also, which seems worthy of notice, and that is on page 17, where the author states that the God, "who has so made and ordered all our bodily members as to suit the conditions in which He has placed us, cannot have given higher faculties than sensation and intellect, to leave them without a possibility of exercise, by failing to respond to a faculty which He has given for no other purpose but as a means of access to Himself, and the attainment of knowledge concern-

ing His modes of operation in cases which supply no other data from which to start our cogitations." This is a point that has always struck me as being one of very great force. In the physical world we see a marvellous adaptability of means to ends. In whatever department of physical science we pursue our studies we find this remarkable evidence of purpose and design. And yet there are those who tell us that all the higher strivings of our nature which lead us to devotion to God, which bring forth prayer and a sense of dependence, and which lie at the bottom of all religion, are produced in us without an object—that the mere physical faculties have a distinct and definite purpose, but that those which are highest of all have been brought into existence for no reason whatever. It seems to me that nothing can be more self-condemnatory than a notion such as this,—that all that is worthiest and best in human nature was given to us without a purpose, but that all the lowest, the meanest, and the most commonplace of our faculties have been bestowed upon us for special and definite objects. I agree, however, with a remark I heard made the other day at a meeting at Cambridge by the Right Hon. W. E. Forster, who said he always felt when he got up to speak as if he were in the House of Commons, and that, whether he had an antagonist or not, he was obliged to think he had one. Like Mr. Forster, I also fancy that I can get on best when I have an antagonist; but in the present instance I cannot term Mr. Blencowe an antagonist, because he is in perfect sympathy with myself, and, this being so, the best thing I can do is to finish what I have to say, and resume my seat. (Applause.)

MR. W. P. JAMES, F.L.S.—I have much the same feeling with regard to this paper as has been expressed by Mr. Lias, namely, that I agree so entirely with it that it is scarcely possible to say anything in regard to it that is not in the shape of praise. I quite concur in the statement that it would be peculiarly ungracious to enter upon a minute criticism of this paper, especially as the author is not present. I think it a most interesting one, and that some parts of it are extremely well put. If anything is open to criticism it is the title, which hardly does it justice. It is rather a branch of the theistic argument in general than a mere discourse on human responsibility. It seems to me to take a much wider field than that indicated by the title, and to deal with the proof of theism from the point of view of man's responsibility to the Creator, at the same time introducing the subject of creation in general. Some of the earlier parts of the paper I consider exceedingly well presented, especially in reference to the various arrangements in nature, from which we must infer a Creator. I may, perhaps, say that among those things from which we generally deduce the argument from design, I myself stumbled on one, which I have not yet seen in print, but which I have several times adduced in arguments I have had with Secularists and Atheists. On one occasion I offered to stake the argument from design upon it, but the challenge was not replied to. The point is this—that when we consider what we see in the world around us, there is scarcely any single thing which furnishes so strong an argumen

for the existence of a Creator as a fact which, perhaps, has been very little thought of in this connection, namely, that, as astronomy teaches us, the earth is constantly subject to two distinct motions, the first being that by which it spins round on its own axis with tremendous velocity; and the second that by which it performs its enormous orbit round the sun, a circuit which is also made at a marvellous rate of speed. Now, when we come to think of it, the world could not be inhabited unless it were so arranged that these tremendous movements should be imperceptible to the creatures upon its surface—and, as a matter of fact, so imperceptible are both these movements that a very long time elapsed before the people living upon the planet became aware of them. This imperceptibility of the movements of the earth I regard as a strong argument in favour of the probability that the world was prepared for habitation before man appeared upon it.

The arrangements, whatever they are, by which this result is attained, such, for instance as the existence of the atmosphere, must be the effect of various complex causes, which certainly seem very plainly to indicate that the earth was intended for the habitation of beings for whom it was essential that they should not be conscious of its motions through space, and who must be sheltered against what might otherwise be the effect of those motions during every moment of their lives. On page 5 of the paper there is a most able exposure of a very common fallacy as to the word "homogeneous." A great many people who read the works of Herbert Spencer are much misled by the use of this word, and there can be no doubt that it is used in a very vague way. It is one of those convenient words which, much more than the expression "anthropomorphic," conceal great confusion of thought. As far as the Greek word "homogeneous" goes, it simply means "of the same kind," and I fancy this gets so fixed in people's heads, that when they talk of the original nebula being homogeneous they suppose it was all of one kind. I think, however, when we come to reflect upon it, we shall find there is no reason to suppose that matter at the beginning was all of one kind. If by homogeneous is simply meant a nebula of uniform consistence—which is probably what Herbert Spencer means—then, as Mr. Blencowe shows, it is not really homogeneous, for the nebula consists of atoms of the elements of which we at present know sixty-three; therefore, it is not homogeneous, but on the contrary, very heterogeneous. I should like to know how an atom of hydrogen could be changed into one of carbon, or sulphur, or iron, or bismuth, or gold, or any other metal; and yet this is what would be meant by evolution in a physical sense. As a matter of fact, no one has ever known an atom of hydrogen become anything but an atom of hydrogen. As regards the note on page 8, the evolution theory is that certain animals placed in the depths of the ocean were once without eyes, as, indeed, is the case now. These creatures do not appear to require them, and manage to get on very well without them; and, this being so, one cannot see why they should not remain satisfied with their condition in this respect. But, according to the

evolutionists we are to assume that these animals became dissatisfied with their want of vision ; that certain small fibres along the surface of their bodies become slightly sensitive to light, and thus they are ultimately led to develop visual organs. Why this should be, we cannot see, nor are we told of what use it can be to them to become slightly sensitive to the action of light. But, nevertheless, this is the orthodox theory, and we must not call it in question. Well, then, having been thus rendered slightly sensitive to light for a thousand years or so, the sensitiveness increases, and this is the theory as to how eyes are developed ! When we have regard to all the long nascent stages which so many generations of these animals must necessarily undergo in the working out of this process, the absurdity of the whole thing is rendered manifest ; and I do not see how such a theory can be treated, except by laughing at it. I think the part of the paper, which deals with the force of conscience, puts the subject in a very clear and able way. It is merely an adaptation of the thoughts expressed by Bishop Butler ; but there can be no doubt whatever, without any appeal to authority, that the universality of the faculty of conscience is one of the great arguments for theism and the existence of God. The three main arguments for this proposition are, the metaphysical argument, the argument from nature, and the argument founded on conscience. The metaphysical argument, which, I think, hardly deserves all the hard names that have been applied to it, is, nevertheless, one of the leading proofs of a First Cause ; the argument from nature is, likewise, a powerful one ; but the argument from conscience is, I suppose, the strongest of all, and I think Mr. Blencowe has put it in an exceedingly able manner.

MR. R. J. HAMMOND.—In page 5 of the paper the author says, “The man who is placed at the head of a grand operative establishment, having a large capital and many subordinates under his control, is bound to greater carefulness, diligence, and fidelity, than any one under him.” Thus, the pressure is put on the human conscience. Then, the author goes on to say, “By this rule, how truly boundless is our responsibility to the Creator and Upholder of all things.” The higher the position the greater the responsibility. The ruler of a state becomes the servant of that state ; the head of a government becomes the servant of his fellow-creatures and cannot sleep as they do, for the cares imposed upon him. This, it should be remembered, is a responsibility which follows what the rulers have learnt from the Divine Controller of the Universe. The Son of God has been down on earth and has taken the place of a servant, saying, “My Father worketh hitherto, and I work.” The divine image of the Father has taken the place of a servant.

MR. J. HASSELL.—I admire the passage on page 7 of the paper, where the writer shows the true effect of the human conscience in the desire and need for God. I hold that the mind of man could never have formed an idea of God, had there not been a God. There must have been the prototype ; for it is impossible to form an idea from what does not exist. We ought never to omit the opportunity of

putting before the people the argument so well urged by the author of the paper, that God is not the abstract idea of Herbert Spencer—that He is not the metaphysical Absolute, Unconditioned, and Infinite of those who adopt Herbert Spencer's views. According to the metaphysical idea of these men, it is impossible to think of such a being as God. With them God becomes "unthinkable"; without attributes, relations, thought, or action, and, therefore, as the author has put it, "without being." I assert that God has relations, as He is our Father, and our King; and we are equally related to Him as His creatures, for whom He framed laws, and for whose wants He makes provision. As opposed to the God of Herbert Spencer, the God of the Bible is a Being of infinite love and compassion; One with whom we can have conscious intercourse, for He is a person—a God, whom we have the power to realise and come into contact and communion with, and is not the metaphysical abstract of the Spencerian philosophy. In opposition to the theory of evolution, I would stand out for the grand principle that God made all His creatures perfect in their order, leading up by various gradations to man, the crowning work of all,—a being formed in His own image, able to worship Him, and capable of personal contact with Him.

Rev. W. C. BARLOW.—In regard to "the terrible charge of being anthropomorphic," page 15, I have never found anything in that term at all like what is described in Austin Caxton's book. What is there regarded as the terrible resonance of the Greek, has not, in reality, any alarming power. Indeed, the word quoted by the author seems to me a most valuable word, and one that we have no need to apologise for. On the contrary, I think we ought strongly to insist on its being the correct word. We are talking everywhere about God as He is known, or can be, or ought to be known to us; and all human knowledge must come under human forms of thought. There must, therefore, be, as I understand Mr. Blencowe to say, an anthropomorphic character in all our knowledge of God. Besides, a word like this has the merit of suggesting a correlated word. It is one of the words which must come with another word in order to complete the meaning, and on page 15 the word is treated of in relation to the question of the probability of a revelation from God to man. That revelation begins almost by an affirmation that man is theomorphic, for "God said, Let us make man in our image," the correlative being that God must be known to man in an anthropomorphic way. That is a point which I think justifies one in saying—henceforth we may glory in the reproach which is conveyed in the censure put upon the word anthropomorphic. We need that word to enable us to declare the whole of the idea, which we hold is only true when it is taken as a whole. (Hear.)

The meeting was then adjourned.

REMARKS BY THE REV. R. COLLINS, M.A.

This paper arouses the mind very forcibly to the consideration of the question, what must be our ultimate defence against Modern Materialism? I think the true answer is, unquestionably, we must take our stand on History. We have, perhaps, too long expended our powers in chiefly endeavouring to show the weak points in the Materialist's line of thought, we have dealt largely in negatives. It is not very difficult to show that many of the assumptions of the materialist are too absurd for belief; and yet it is possible to mistake or misstate them. For instance, the Materialist does not attribute design to the animal or plant that improves itself. The note on page 8 correctly expresses the evolutionist's theory: but he would not, as on the same page, speak of an animal "discerning the advantage of tentacula," &c. With the materialists the will and intelligence are simply "*physical phenomena* produced by, or associated with "molecular processes," excited in the brain by external circumstances; the will or "cogitation" has no hand in Evolution, only the inherent forces of nature, or whatever other term may be used; so that, as Professor Huxley says, "the whole world, living and not living, is the result of the mutual inter-action, according to definite laws, of the forces possessed by the molecules of which the primitive nebulousity of the universe was composed." These forces, however, always manage to work for *harmony*; and the evolutionists are *obliged* to use, or choose to use, the language of intelligence. Darwin's phrase "*natural selection*" is a case in point. This always seems to me a tacit, though no doubt unwilling, testimony to the fact, that "final causes" are being worked up to; and it is difficult to conceive that, without supposing previous intention somewhere. And yet intention is no part of the Evolutionist's theory.

How are we then, in our turn, to explain the potency or potencies, or whatever term may be acceptable, under which the *Cosmos* is what it is? Mr. Herbert Spencer unifies this effort in Nature, and expresses it as "an Infinite and Eternal Energy from which all things proceed." Our mission is to show that the Infinite and Eternal Energy is the Energy of an Infinite and Eternal Intelligence: and to persuade men of this we must fortify our statement that this Intelligence *has spoken* to man. Natural Religion and mere reason have not weapons strong enough for the entire defeat of Materialism. We need Revelation.—In short, we must gather our forces more and more within the domain of History. The "inward testimony" of man—a point emphatically brought out in Mr. Blencowe's paper—existing as far back as we can trace his history, to the existence of a Creator and Upholder of all things, is, in fact,

the result of that Creator's revelation of Himself. The ancient literature of the nations, and the records that are being disintombed from the long-forgotten mounds of Eastern cities, are to furnish, especially in their confirmation of the Jewish and Christian Scriptures, the best weapons against Modern Scepticism. To the man, who is convinced that God *has spoken*, materialism becomes necessarily an empty and useless dream. And, as regards the prominent topic of this paper, to the man, who is convinced of an Infinite and Eternal Intelligence, the Author of all being, the doctrine of human responsibility becomes an intense reality, the pole-star of human moral life : while to the materialist it is but one result of what have been called "social forces," and must be as changeable and evanescent as "social forces" themselves have ever been.

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NEBUCHADNEZZAR, King of Babylon.

On Recently-discovered Inscriptions of
this King.

BY

ERNEST A. BUDGE, B.A.

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THE excavations carried on in Mesopotamia during the last few years have been productive of especially good results. Not only has Assyrian grammar and lexicography been enriched by magnificent "finds" of bilingual and grammatical tablets, but a considerable quantity of history has been made known to us through the discovery of cylinders which were inscribed during the latter years of the Babylonian Empire. They are peculiarly valuable, because they are the productions of those who lived at the time when the events happened which they record. Moreover, by means of the numerous contract and loan tablets which are in the collection of our National Museum, a keener insight has been afforded us of the commercial and other affairs of the Babylonian and

Assyrian Empires. Only a few years ago the discovery of the Egibi tablets revealed the great loan and banking system that was carried on in Babylon. Recently a valuable historical cylinder of Cyrus the Great showed exactly what was going on in Babylon at the time of the actual capture of the city. This is "perhaps the most interesting cuneiform document that has yet been discovered."* Other tablets give the reasons and circumstances of the actual capture. Among other things brought home recently were two inscribed cones, one very much rubbed and almost illegible in many places; the other broken into three pieces, but fortunately containing the text in a fair state of preservation. One inscription is an amplification of the other, and both relate to Nebuchadnezzar, and are the subject of this paper. They are very interesting, the spelling on them is very curious, and a great deal is said concerning the gods and goddesses of Babylon. They mutely proclaim the glory of the great king, who said: "Is not this great Babylon that I have built for the house of the kingdom by the might of my power, and for the honour of my majesty?"† The inscription is written throughout in the peculiar Babylonian style, and as far as possible these peculiarities have been reproduced in type.

The inscription begins with "Nebuchadnezzar, the King of Babylon, the exalted prince, the worshipper of the god Marduk, the prince supreme, the beloved of the god Nebo. I am established, the unfearing one, the restorer of the temple of the 'lofty head' and the temple of Zida, who to the god Nebo, and the god Marduk, his lords, worship also has performed before them (?). The exalted one, he who causes the *ituti* to be deep, the messenger of the great gods, the eldest son of Nabopolassar, the king of Babylon I am."

Nabopolassar is the *Nabu-pal-usûr* of the cuneiform inscriptions. Concerning Nabopolassar, it is known that he was a general who was rewarded with the crown of Babylon for satisfactorily quelling a revolt. He made Babylon a tolerably powerful kingdom and this was the more easily accomplished from the fact that the Assyrian power had been utterly overthrown. It is self-evident that he left his reviving power in strong and energetic hands. The name Nebuchadnezzar has been explained in various ways by scholars, possibly because the name has been found written differently in the text of the Bible.

* Sir H. C. Rawlinson in the *Jnl. R.A.S.*, vol. xii. p. 70.

† Daniel iv. 30. In the text itself, verse 27.

headed," was the shrine of the god Bel. The celebrated golden image which Nebuchadnezzar made was of this god.* The second temple was dedicated to Anu. Now Bel was one of the first great triad of gods, which consisted of Anu, Ea, and Bel, and all these were the children of Zigarû, "the sky." *Zigarû* is the gloss given by W.A.I., ii. 48, 26, and is the

pronunciation of the ideograph , which is equated with the Assyrian , *samû*, Hebrew שָׁמַיִם.

The following are the names, ideographs, and glosses of the names of the three great gods (W.A.I., ii. 48).

SÛSRU.	D.P. A - nu - um
UBIGARGA.	D.P. En - til
TAL. TAL.

Anûm is the Assyrian form of the Accadian AN-NA.† Ea was the "king of rivers and gardens," and, as we see from the above extract, *bil nemiki bil ha-si-si*, "lord of deep wisdom and knowledge." He was the husband of Bahu or chaos (the בְּהוּ of Gen. i. 2), and made father of Bel-Merodach, the tutelary deity of Babylon. Sir Henry Rawlinson thinks the monotheistic Hebrews of Ur belonged to the followers of Ea, he says: "He was the 'Creator of mankind,' 'the God of life and knowledge,' 'the Lord of *Thib* (the blessed city) or Paradise,' and exhibits many other traces of identity with the Elohim of the Jews. There seems, indeed, to be an allusion to this deity being

* Concerning the statue of Bel, see Daniel, chap. iii. ; Herodotus, bk. i. ; Strabo, xvi. ; Pliny, vi. chap. xxvi. ; Q. Curtius, lib. v. ; Arrianus, lib. vii. ; and Selden, *De Diis Syris*, p. 193 *et seq.*

† The following extract shows these gods had other names (S. 35) :—

accepted by the Monotheists as the one true God, in the last verse of chap. iv. of Genesis, where, as I understand the passage, it is said that 'about this time, he (*i.e.*, Seth, the Lord of *Thib*) began to be called by the name of Jehovah.'"*

The god Ea and his son Marduk will always be of the greatest interest to the students of comparative religion. Ea was the lord and governor of all mankind, the supreme great god; his son Marduk was the mediator between man and this god. The children of men offered their prayers to him and he bore them to his great father who received them at his hands. The complaint of the penitent sinner was directed to Ea through his son Marduk, and he commissioned his son, the god of light, to bestow his pardon on him. The rebellion of the gods of darkness and night, against light, was quenched by this shining god; and to the mind of the Babylonian he was the saviour of all.

After the first triad of gods came "the seven magnificent deities." Only six of them are mentioned in the inscription under consideration, but below are a list of the seven with ideographs, glosses, &c.

GLOSS.	IDEOGRAPH.	ASSYRIAN NAME.
(𒌦 𒌦 𒌦) DUMUGU.	𒌦 𒌦	𒌦 𒌦 D.P. Sin.
(𒌦 𒌦 𒌦) UTUKI.	𒌦 𒌦 𒌦	𒌦 𒌦 D.P. Samas.
(𒌦 𒌦 𒌦) MĒRMERI.	𒌦 𒌦 𒌦 𒌦	𒌦 𒌦 D.P. Rammanu.
(𒌦 𒌦 𒌦) GUDIBIR.	𒌦 𒌦	𒌦 𒌦 D.P. Marduk.
(𒌦 𒌦 𒌦) GĀSMU.	𒌦 𒌦 𒌦	𒌦 𒌦 𒌦 D.P. Zarpanitum.
(𒌦 𒌦 𒌦) TIMSAR.	𒌦 𒌦 𒌦	𒌦 𒌦 𒌦 D.P. Nabium.
(𒌦 𒌦 𒌦) KURNŪN.	𒌦 𒌦	𒌦 𒌦 𒌦 D.P. Tasmetum.

The first god in the list is the moon. He was always considered prior to the Sun, and was called "the mighty god." * The 29th day of Elul was called "the rest day of the Moon, the day when the spirits of heaven and the spirits of earth are invoked." Istar was goddess of the half month. The number of tablets in the ancient astronomical library relating to the moon must have been immense, when we consider what a large number are remaining which deal wholly with the moon and its appearances. The Sun was called the "Lady, the mistress of the world." Its gender therefore was feminine.† The god whose name is read *rammanu*, was lord of the air, rain, clouds, and storm. Marduk was the son of Ea and Dam-kina "the earth" male and female. His Akkadian name was AMAR-UT' or AMAR-UTU, "the brilliance of the Sun." He bore different names in different months.‡ The next name we meet is that of the god Zarpanituv. This is the כְּבוֹת בְּנוֹת of 2 Kings xvii. 30, (LXX. σκαχὼθ βενίθ), and it is said there that the Babylonian colonists who were brought from Samaria made them for their idols. Rashi on 2 Kings, xvii. 30, says concerning Succoth Benoth: דמות תרנגולת עם אפרוחיה "the image of a cock with its chickens." § Selden in his *De diis Syris* makes it to be Venus. He shows there how ב has the two sounds of *b* and *v*, and how *t* changes into *s*, so that *Benoth* comes to *Benos*, and finally *Benos* to *Venos*, and says, "Binos Græca pronuntiatione est Venus nostra." || Passages concerning the worship are quoted in the note below. The old Akkadian name for the moon god 𐎶𐎵 𐎶𐎵 𐎶𐎵 is twice

* W.A.I., iv. 33, 9.

† In the Bible it is masc. (Ps. civ. 19); and fem. (Gen. xv. 17).

‡ See W.A.I., iii. 53, 2; and Sayce, *Trans. Soc. Bib. Arch.*, iii. 166.

§ For the history and derivation of the word תרנגול, see Rev. W. H. Lowe, M.A., *Critical Notes*, p. 5, in his *Fragment of the Talmud Babli Pesachim*, Cambridge, 1879.

|| *Succæ* est fanum in quod se matronæ conferebant atque inde procedentes ad questum, dotes corporis injuria contrahebant. P. 314. Ita Benoth ipsum etiam nimen denotabat, et Succoth tabernacula seu ædes. . . . Ipsissimum enim erat Babylonie Mylittæ sive Veneris Uranie templum, ubi puellæ corollis revinctæ, et sedentes singuli in spatiis quæ funiculis erant distincta, hospites opperiebantur qui rite implorata Venere Mylitta, pecuniaque quantulacunque data (quæ Deæ sacra) cum eis a fano subductis rem haberent. . . . Heic plane filiarum seu muliercularum tabernacula, id est, Succoth Benoth. . . . Mulieres, ait, funiculis circumdatae, in viis sedent, ut furfures adoleant. Et si qua earum cum advena quovis, qui vi eam sibi attraxerit, cubaret, proximam conviciabatur, quod nequaquam simili afficeretur honore, nec funiculus ejus disrumperetur.—*De Diis Syris*, p. 309–313.

sarrani, "kings."

abni, "stones."

kakki, "weapons."

→† for →† → ili rabī, "great gods." *
ilāni rabūti.

In col. 3 line 22 we meet with an example of the redundancy so common in Syriac, thus:—*subursu dur Bārzippar* "the height of it—the fortress of Borsippa," i.e. "the height of the fortress of Borsippa."

And this brings us to the consideration of Babylon itself. Babylon is the Greek form of Babel or Bab-ili. And Ba-bel is the exact Semitic translation of the Akkadian KA DINGIRRA, or "the gate to god." It bore two other names, viz., EKI "the house," *par excellence*, and DIN-TIR "the house of the jungle," † or, according to others, "the place of life." But this is properly the designation of the town on the left bank of the river. Babylon is also expressed by → →† D.P. Bab-ilani "the gate of the gods." ‡ It was said to have been built in very early times, it became the capital under Khammuragas (B.C. about 1700, who built a temple to Merodach there) and held this position for 1200 years. It was conquered by Tukulti-Ninip, B.C. 1271; by Tiglath-Pileser I. B.C. 1110; by Tiglath-Pileser II. B.C. 731; by Merodach Baladan, B.C. 722; by Sargon, B.C. 721. It was sacked and burnt by Sennacherib, B.C. 692; restored by Esarhaddon, B.C. 675; captured by Assur-bani-pal, B.C. 648, (also by Nabu-pal-ušur, B.C. 626?) and finally taken by the Medes and Persians about B.C. 539. The city was built on both sides of the river in the form of a square, and was enclosed within a double row of high walls, the inner being called Ingur-Bel, the outer Nimitti Bel. Ctesias makes the outer walls 360 stades in circumference, Herodotus and Pliny § 480, Strabo || 385, Q. Curtius ¶ 368, and Clitarchus ** 365.

* This usage reminds us of the בָּאֵרִים בָּאֵרִים of Genesis xiv. 10, to express multitude, מִמּוֹר מִמּוֹר of Judges xv. 16.

† Sayce in the *Encyclopædia Britannica*, art. "Babylon," 9th edition.

‡ *Trans. Soc. Bib. Arch.*, vii. p. 109.

§ N. H. vi. 26. || xvi. i. 5.

¶ v. i. 26.

** ἀπολαβοῦσα δὲ τὸν Εὐφράτην ποταμὸν εἰς μέσον, περιβάλετο τεῖχος τῇ πόλει σταδίων ἐξήκοντα καὶ τριακοσίων, διειλημμένον πύργοις πυκνοῖς καὶ μεγάλοις, ὥς φησι Κτησίας ὁ Κνίδιος, ὥς δὲ Κλείταρχος καὶ τῶν ὕστερον μετ' Ἀλεξάνδρου διαβάντων εἰς τὴν Ἀσίαν τινὲς ἀνέγραψαν, τριακοσίων ἐξήκοντα καὶ πέντε σταδίων καὶ προστιθέουσιν ὅτι τῶν ἰσων ἡμερῶν τῶν σταδίων ὑποστήσασθαι.—Diod. Siculus, book ii. sect. 7.

The spaces between the towers were broad enough to allow a pair-horsed chariot to turn (Herod. i. 179).^{*} The question of the actual height has been discussed by Sir H. Rawlinson in *Herodotus*, and by Dr. Oppert in the *Athénæum Français*, 1854, p. 370. The celebrated Hanging Gardens were on the eastern side of the river and within the palace precincts. They were built in the form of a square (each side being 400 feet long) upon a series of arches.[†]

The absence of genuine history in the inscriptions of Nebuchadnezzar is remarkable. All the inscriptions yet found narrate his great care to make Babylon a success in the matter of buildings. There is no doubt he was a most pious king, and whether he considered the giving an account of his restoration and rebuilding of the temples of the gods of more importance than a narrative of his wars, is very hard to say. If only the history of his expedition through Palestine, of his siege of Tyre, and of his defeat of all the nations in that part of the world could be found. In the following inscription, the large India House inscription is perhaps referred to when he speaks of the account of his works which he wrote.

Nebuchadnezzar III., son of Nabupolassar, reigned from about B.C. 605 to B.C. 562. He took command of the Babylon-

^{*} One cannot help thinking there must be an allusion to these mighty walls in the verse in Jeremiah (li. 53), "Though Babylon should mount up to heaven, and though she should fortify the height of her strength," &c. (כי תבצר מורם עזה).

[†] "In uno latere civitatis erant horti suspensi, fere conjuncti fluvio Euphrati; qui numerabantur inter septem miracula mundi. Situs eorum erat figuræ quadratæ, quadringentorum pedum, per quemlibet angulum quibus corresponderent secundus et tertius. Intus erant quatuor atria vel aræ, quadringentorum pedum longitudinis, et centum latitudinis, ita ut una supra aliam emeretur. Prima elevebatur a terra duodecim cubitos cum dimidio. Secunda, viginti cubitos. Tertia, triginta septem cubitos cum dimidio. Quarta, proxima Euphrati, quinquaginta cubitos. Illic extrahebatur aqua ab Euphrate certis quibusdam machinis, ad irrigandos hortos. Tota hæc structura sustinebatur fornicibus latericiis, sibi coherentibus lato interstitio secundum proportionem arearum; quorum quilibet habebat duodecim pedes diametri; distabat itaque unus at altero fornix pedes viginti duos; et hoc quidem tam pro firmatione intermedia, quam pro commoditate mansiuncularum quarundam, ibi exstructarum. Superiora harum tabernarum, primo erant instrata magnis lapidibus, longitudinis sedecim pedum, et quatuor latitudinis. Deinde totum illud erat coopertum multis arundinibus. Tertio, omnes illæ arundines erant obtectæ magnis laminis plumbeis, quæ defenderent fornices ab humiditate terræ. Tandem erat super omnia hæc, optima terra, exculta exquisitis floribus et plantis," &c.—*Not. in Diod. Sic.*, i. p. 124.

of human labour that must have been as his disposal. Sacred and profane writers alike give testimony to the glory of his city, his palaces, gardens, temples, and the massive golden image of the god Bel. Numerous indeed were the gods whose shrines filled Babylon, and Jeremiah sarcastically alludes to this (chap. l. 38) when he says: "For it is a land of graven images, and they madly confide in idols."* As a general and as an architect he was great, and one instance of kindness is recorded of him. For we read: "Nebuchadnezzar, King of Babylon, gave charge concerning Jeremiah by the hand of Nebuzaradan, the captain of the guard, saying, Take him and set thine eyes upon him, and do him no harm, but do unto him even as he shall say unto thee" (Jerem. xxxix. 11).

The inscription finishes with a prayer of the king to the god of Marad. It reads thus:—

- Col. iii. l. 15, "O God, the king AMARDA, the lord of all warrior (gods)
 „ 16, to the brickwork of my hands for blessing
 „ 17, joyfully be favourable, and
 „ 18, a life to a day remote (with)
 „ 19, sufficiency of glory,
 „ 20, establishment of throne and a long reign
 „ 21, for a gift O give!
 „ 22, Sweep away the disobedient
 „ 23, Shatter their weapons
 „ 24, Devastate all the land of the enemy
 „ 25, Sweep away the whole of them
 „ 26, with thy powerful weapons
 „ 27, which benefit not my enemies
 „ 28, May they draw near, and may they sting
 „ 29, to the subjugation of my enemies may my hands go.
 „ 30, In the presence of Marduk, king of heaven and earth
 „ 31, my works cause to be blessed,
 „ 32, command my prosperity."

Nebuchadnezzar died about B.C. 562, and was succeeded by his son, Evil-Merodach.†

* בִּי אֶרֶץ פְּסִילִים הִיא וּבְאֵימִים יִתְהַלְלוּ :

† Nebuchadnezzar, after he had begun to build the fore-mentioned wall, fell sick, and departed this life when he had reigned forty-three years, whereupon his son, Evil-Merodach, obtained the kingdom.—Fl. Joseph. *against Apion*, i. sec. 20.

INSCRIPTION OF NEBUCHADNEZZAR, KING OF BABYLON
FROM A RECENTLY-DISCOVERED CLAY CYLINDER
IN THE BRITISH MUSEUM.

COLUMN I.

1. Nebuchadnezzar the king of Babylon,
2. the exalted prince, the worshipper of the god Marduk
3. the supreme lord, the beloved of the god Nebo,
4. the unwearied prince of the gate,
5. the restorer of the temple SAG-ILI and the temple ZIDA
6. who to the god Nebo and the god Marduk his lords
7. worship has performed before their persons
8. the exalted one, who causes the *ituti* to be deep, the
messenger of the great gods,
9. the eldest son of Nabu-pul-uṣur (Nabopolassar),
10. the king of Babylon am I.
11. Prince Marduk the great lord then caused me to hold
firmly
12. a sceptre (?) to rule the people [as a] shepherd,
13. to restore the fortresses, and to renew the temples
14. greatly he encouraged me.
15. I put my trust in Marduk, my lord, my judge,
16. his supreme fortress, the citadel his high place [the walls],
17. Imgur-Bel, Nimitti-Bel
18. I caused to be completed over their great fortresses
19. upon the threshold of its great gates
20. mighty lords (gods)
21. and [images] of poisonous snakes
22. I set up
23. the which never had any king my predecessor made.
24. The quay (of the fortress), its ditch (moat)
25. with bitumen and brick
26. the father my begetter built and completed for a bulwark.
27. As for me, the paths of the ancient quay
28. once, twice
29. I built up with bitumen and brick, and
30. the quay which my father had worked I excavated.
31. I caused its foundation to be laid with huge flat slabs, and
32. I raised up its summit like a mountain.
33. The quay of brick at the ford of the setting sun
34. within Babylon I completed.

35. The paths along the quay
36. with bitumen and brick
37. the father my begetter had worked at ;
38. its buttresses (?) with brick
39. along the river of Sippara I bound together,
40. and I fully completed its banks.
41. As for me his eldest son (*i.e.*, eldest son of Nabopolassar)
42. the beloved of his heart,
43. the paths along the quay
44. with bitumen and brick,
45. in addition to the quay which my father had made, I
renewed.
46. In the temple of SAG-ILI the kišsra I set.
47. The palace of heaven and earth, the seat of tranquillity,
48. E-KU-A the shrine of Bel, the temple of the gods and
of Marduk,
49. the gate of Hilisud the seat of the goddess Zirpanitum,
50. and the temple of ZI-DA the dwelling-place of the divine
king of heaven and earth
51. I caused them to be covered with shining gold and
52. I made them brilliant as the day.
53. The temple, the foundation of heaven and earth, the
tower of Babel
54. I built anew
55. The temple of ZIDA, the eternal, the (temple) beloved
of Nebo
56. I built anew within Borsippa, and

COLUMN II.

1. with gold and sculptured stones
2. I made [it] like the brilliance of heaven.
3. I caused it to be covered over with durable cedar and
gold
4. up to the ceiling of the great temple of Life. The shrine
of Nebo
5. I caused to be erected before those three
6. The great temple, the temple of the "lady of the head-
land" within Babylon,
7. the temple (called) "he gives the sceptre of the world,"
the temple of Nebo of Harie,
8. the temple of Namgan, the temple of the wind within
Kumari,
9. the temple of the dwelling, before the lady of heaven
near the fortress,

10. I rebuilt within Babylon, and
11. I reared up their summits
12. the which never had any king my predecessor done.
13. Four thousand cubits square, the citadel with walls
14. towering and inaccessible
15. the everlasting fortress of Babylon at the ford of the
rising sun
16. I caused to surround.
17. I dug out the moat, I emptied away the water that had
gathered there,
18. I made its bed of bitumen and brick, and I excavated
19. the quay which my father had worked at.
20. the lofty fortress with bitumen and brick
21. I built up like a mountain upon its side.
22. The height of the fortress of Borsippa thoroughly
23. I rebuilt.
24. The quay and the moat [lined and built] with bitumen
and brick
25. I made to surround the citadel for a protection.
26. For the god Turkit, the lord, the breaker of the weapons
of my enemies
27. I rebuilt his temple within Borsippa.
28. The temple of the Sun, the temple of the sun-god of
Sippara,
29. the temple the established seat, the temple of the
god
30. of the city Bätz,
31. the temple of the eyes of Anum, the temple of the god
Dar
32. of the city of the planet Venus,
33. the temple of heaven, the temple of Istar of Erech,
34. the temple of the sun, the temple of the sun-god of
Larsa,
35. the temple of KIS-KUR-GAL, the temple of the moon-god
of Ur,
36. these temples of the great gods
37. I rebuilt; and
38. I caused their beautiful adornments to be completed.
39. The restoration (or furniture) of the temples of SAG-ILI
and ZIDA
40. the new places of Babylon
41. which more than before
42. I have made more extensive
43. and I have established them even to their summits.

44. An account of all my magnificent works,
45. and of my restorations of the temples of the great gods
46. above what the kings my fathers wrote
47. upon a stone tablet I wrote ; and
48. I set it up for future days.
49. The account of all my works
50. which I have written upon the stone tablet
51. with understanding mayst thou look upon
52. and upon the glorious things of the gods.
53. May [men] understand that
54. I built the fortresses of the gods and of the goddess Istar
55. of the great lord and of Marduk.

COLUMN III.

1. As for myself Marduk urged me on,
2. he girded me up in heart,
3. reverently, and not failing him
4. I completed his beautiful [works].
5. [I rebuilt] (?) for the god the king of Marad, my lord,
6. his temple within Marad the
7. which had been built from a remote time ;
8. its ancient foundation stone
9. which no former king had ever seen
10. I took hold of, I uncovered, and
11. upon the foundation stone, the beloved of the Moon-god,
the king,
12. my ancient father, I laid down its foundation.
13. I made an inscription in my name, and
14. I placed it within it.
15. O God the king of Marad, lord of all warriors,
16. to the brickwork which my happy hands [have made]
17. be favourable joyfully and
18. my life to a far distant day
19. with abundance of glory,
20. fixity of throne, and length of rule
21. to eternity do thou lengthen.
22. Sweep away the disobedient,
23. break in pieces their weapons,
24. devastate the lands of the enemies,
25. sweep them all away.
26. Thy mighty weapons
27. which benefit not my enemies

28. may they draw near and may they fight
 29. for the subjugation of my enemies, may they go by my sides.
 30. In the presence of Marduk king of heaven and earth,
 31. upon my works pronounce blessing
 32. command my prosperity.

TEXT AND TRANSLATION.

COLUMN I.

1.
 D.P. Na - bi - uv - cu - dur - ri - u - tsu - ur
Nebuchadnezzar

 sar Ba - bi - lav D.A.
the king of Babylon

2.
 ru - ba - a - av na - a - dav mi - gi - ir
the exalted prince the worshipper

 D.P. Marduk
of the god Marduk

3.
 is - sa - ak - ku tsi - i - ri na - ra - am
the prince supreme, the beloved

 D.P. Na - bi - uv
of the god Nebo

4.
 sa - ac - ca - na - cu la - a ne - kha
I am established the unresting or
 la - a pil - kha
the unfearing one

5.
 za- ni - in E SAG - ILI u E ZI - DA
the restorer of the temple of the lofty head and the temple of Zida

6.
 sa a - na D.P. Na - bi - uv u D.P. Marduk
who to the god Nebo and the god Marduk

 beli - su
his lords

7.
 ci - id - nu - su - va ib - bu - su ri - e - su - su - un
worship also has performed before their persons

8.
 na - a - dav mu - us - te - mi - ku i - tu - ti
the exalted one, he who causes the ituti to be deep,

 sa - par ili rabi
the messenger of the great gods

9.
 ablu a - sa - ri - du sa D.P. NABU -
the eldest son of Nabu -

 PAL - u - tsu - ur
palutsur

10.
 sar Ba - bi - lav D.A. a - na - cu
King of Babylon I am.

¹ Variant .

11. D.P.
The prince Merodach great lord

firmly may he cause me to hold also

12.
a sceptre (?) to direct the people the shepherd,

13.
(to) restore the fortress to renew

the temples

14.
greatly he encouraged me

15. D.P.
I upon the god Marduk my lord,

my judge trusted

16. D.A.
Babylon his supreme fortress,

the citadel his high place

17.
 Im - gu - ur Bel Ni - mi - it - ti
Imgur-Bel Nimitti

 D.P. Bel
Bel

18.
 e - li dur - su GAL - GAL
upon its great fortress
-
 u - sa - ac - li - il
I caused to be completed

19.
 a - na se - ip - pi ABULLI - su
upon the threshold of its great gates

20.
 bi - e - li e - ik - du - u - tiv
gods (?) mighty

21.
 u TSIR RUS TSIR RUS tu - zu - u - tiv
and powerful snakes strong (poisonous)

22.
 u - us - zi - iz
(then) I set up;

23.
 sa sar ma - akh - ri - iv la i - pu - su
which a king preceding (me) had not made

24.
 cā - a - ri khi - ri - ti - su
its quay its ditch (moat)

25. i - na
with IDDU bitumen u and libittu AL brick

UR - ra

26. a - ti - si - ni - su a - ba - a - av a - li - tu
its (?) the father (my) begetter

u - sa - al - am
the citadel completed (or raised).

27. ya - ti - ca - a - ri dara - a - ti bu - su - si - su
As for me the quay lasting its paths

28. is - ti - en - ni - ti sa - ni - i
once, twice

29. i - na IDDU u libittu
with bitumen and brick

UR - ra ab - ni - va
I built and

30. it - ti - ca - a - ri a - ba - av ik - zu - ru
with the quay (my) father had made (bound)

e - es - ni - ik - va
excavated and

31. i - si - su i - na bu - ra - at CI - GAL
its foundation with the of inscription stones

u - sa - ar - si - id - va
I caused to be laid down and

32. ri - si - su sa - da - ni - is
its head like a mountain

u - za - ak - ki - ir
I raised up

33. ka - a - ri - iv libittu AL UR alu
the quay of brick (at) the city

pal - ri D.P. Sam - su
the ford of the setting sun

34. i - na Ba - bi - lav u - sa - al - av
within Babylon I raised.

35. ka - a - ri a - ra - akh - tiv
the quay, the paths

36. i - na IDDU u libittu
with bitumen and brick

AL UR - ra

37.
a - ba - av a - li - tu ik - zu - ur - va
the father (my) begetter worked at and

38.
ba - ca - a - tsi libittu AL - UR - ra
with brick

39.
a - ba - ar - ti nahar puranunu D.A.
along the river of Sippara

u - ra - ak - ki - is - va
I bound together

40.
ma - la u - sa - ak - li - il
fully I completed

se - it - ta - a - tiv
its banks

41.
ya - ti a - bi - il - su ri - e - es - ta - a - av
As for me his eldest son

42.
na - ra - am li - ib - bi - su
the beloved (one) of his heart

43.
ka - a - ri a - ra - akh - tiv
quay paths i.e. (the road along the quay)

¹ In a four-column bilingual list the pronunciation of this word is said to be , *pu-ra-nu-nu*. W.A.I., V, 22, 31.

44.
 i - na IDDU u libittu UR - ra
 with bitumen and brick

45.
 it - ti ka - a - ri a - ba - a - av
 with the quay (which my) father

 ik - zu - ur - ru u - sa - an - ni - in
 had made I renewed.

46.
 i - na E SAG - ILI ki - its - tsi - ra
 In the "temple of the lofty head" the whole

 as - ba - av
 collection I set.

47.
 E - GAL sa - mi - e u ir - zi - tiv
 The palace of heaven and earth

 su - ba - at ta - si - la - a - tiv
 the seat of prosperity

48.
 E CU - A pa - pa - kha Bel
 The temple of E CU-A the shrine of Bel,

 bit ilani D.P. Marduk
 the temple of the gods (and) Marduk

49.
 bab khi - li - sud su - ba - at
The gate of Khilisud the seat

 D.P. Zir - pa - ni - tuv
of the goddess Zirpanituv

50.
 E ZI - DA su - ba - at D.P. sar
The temple of Zida, the dwelling place of the divine king

 dim - me - ir AN - CI - A
heaven and earth

51.
 D.P. khuratsi na - am - ru u - sa - al - bi - is - va
with shining gold I caused (them) to be covered and

52.
 u - na - am - mi - ir ki - ma um - uv
I made them bright like the day

53.
 E temen sami irtsiti zi - ku - ra - at
The temple of the foundation of heaven and earth the tower

 Ba - bi - lav D.A.
of Babylon

54.
 e - es - si - is e - pu - us
anew I built

55. E zi - DA E ki - i - nuv na - ra - am
The temple of Zida, the established, the beloved

D.P. Na - bi - uv
(temple) of Nebo

56. i - na Ba - ar - zi - pav D.A.
within Borsippa,

e - es - se - is ab - ni - va
anew I built and

COLUMN II.

1. i - na D.P. khuratsi u ni - se - ik - tiv
with gold and sculptured

abni
stones

2. ki - ma si - be - ir - ti sa - ma - mi
like the splendour of heaven

u - ba - an - niv
I built (it)

¹ This name is written Dur Ši-ab-ba (*Trans. Seo. Bib. Arch.*, Vol. VII, p. 106.)

² Var. .

³ Var. .

3.
 e - ri - nuv dara - tiv D.P. khuratsi
 (with) cedar lasting and gold

 u sa - al - bi - is - va
 I caused to cover and

4.
 a - na tsu - lu - ul E MAKH TI - LA
 for the {overshadowing
 ceiling} of the great temple of Life,

¹
 pa - pa - kha D.P. Nabu
 the shrine of Nebo

5.
 pa - nuv se - lal - ti - su - nu u - sa - at - ri - its
 before those three I caused to be erected

6.
 E MAKH E D.P. NIN - KI - SAK E lib - ba
 The great temple, the temple of the lady of the headland,

 KA DINGIR - RA D.A.
 the temple within Babylon

7.
 E D.P. khaddhi - kala - ma - idinna - va
 The temple "he gives the sceptre of the world,"

 E D.P. Na - bi - uv sa Kha - ri - e
 the temple of Nebo of Kharie

¹ Var. .

8. E NAM - GAN E Rammanu lib - ba
The temple of Namgan, the temple of wind within

Ku - ma - ri D.A.
Cumari

9. E KI - KU pa - an E D.P. BELTI
The temple of the dwelling, before the temple of the lady,

an - na sa tu - up - ga - at duri
of heaven of the regions of the fortress

10. i - na Ba - bi - lav D.A. e - es - si - is
within Babylon afresh

ab - ni - va
I built and

11. u - ul - la - a - av ri - e - sa - si - in
I raised up their summits (heads)

12. sa ma - na - a - ma sar ma - akhi - ri la i - pu - su
which (temples) never a preceding King had made

13.
 IV x 1,000 ammati ka - ka - ra - av
Four thousand cubits square

 i - ta - a - at
the walls of the citadel

14.
 ni - se - is la da - khi - e
loftily inaccessible

15.
 duru daru pal - ri D.P. Samas atsu
The fortress eternal of the ford of the rising sun of

 Ba - bi - lav - D.A.
Babylon

16.
 u - sa - as - khi - ir
I caused to surround

17.
 khi - ri - su akh - ri - e - va su - pu - ul mi - e
its ditch I dug out and the depth of waters

 ak - su - ud
I took (emptied)

18. ¹
 ki - bi - ir - su i - na IDDU
its bed with bitumen

 u libittu AL - UR - ra ab - ni - wa
and brick I built and

19.
 it - ti ka - a - ri a - ba - a av ik - zu - ru
with the quay (my) father had made,

 e - se - ni - ik - wa
I cut it out and

20. ²
 duru daru i - na iddu
the lofty fortress with bitumen

 u libittu AL - UR - ra
and brick

21. ³
 i - na ki - sa - di - sa sa - da - ni - is
upon its side like a mountain

 ab - niv
I built

¹ Var. .

² Var. .

³ Var. .

22. dha - a bi su - bu - ur - su dur
well the height of (lit. its height of) the fortress of

Ba - ar - zi - pav D.A.
Borsippa

23. e - es - se - is e - pu - us
afresh I built (made)

24. ka - a - ri khi - ri - ti - su i - na
the quay, its ditch with

iddu u libittu AL UR - ra
bitumen and brick

25. a - na ki - da - nuv u - sa - as - khi - ir
a citadel for a protection I caused to surround

26. a - na D.P. TUR-CIT bilu mu - sa - ab - bi - ir
For the god Tur-cit, the lord, the breaker of the

D.P. KAKKI sa na - ki - ri - ya
weapons of my enemies

27. D.A.
his temple within Borsippa
-
afresh I built.
28.
The temple of the Sun, the temple of the Sun-god of Sippara.
29.
The temple the established seat, the temple of the god
30. D.A.
of the city of Bâts
31.
The temple of the eyes of the god Anu, the temple of the god Dar
32. D.A.
of the city of the planet Venus.
33. D.A.
The temple of heaven the temple of Istar of Erech
34. D.A.
The temple of the sun, the temple of the Sun-god of Larsa

¹ Var. $\{\{\}$.

² The modern Dailem.

35. ¹
E. CIS - CUR - GAL E EN - ZU sa URU D.A.
The temple of the temple of the moon-god of Ur
36. ²
e - es - ri - e - ti ilani rabuti
(these) temples of the great gods
37. ³
e - es - se - is e - pu - us - va
afresh I built and
38.
u - sa - ac - li - il si - bi - ir - si - in
I caused to be completed their beautiful (adorments)
39.
zi - in - na - a - at E SAG-ILI
furniture of the temple of the lofty head, (and)

E ZI - DA
the temple of Zida
40.
te - di - is - ti Ba - bi - lav. D.A.
the new places of Babylon

Ba - ar - zi - pav. D.A.
(and) Borsippa
41.
sa e - li sa ma - akh - ri - iv
which more than before

¹ Var. ~~+~~.

² Var. $\gg$.

³ Var. $\triangleleft$.

42.

u - sa - ti - ku - va

I have caused to exceed and

43.

as ku - nuv a - na ri - e - es - e - tiv

I have established them even to their summits

44.

ka - la

e - ip - se - e - ti - ya

(an account)

of all my costly

su - ku - ra - a - tiv

works

(and)

45.

za - na - an e - es - ri - e - ti

ilani rabuti

the restoration

of the temples

of the great gods

46.

sa e - li

sarrani

ab - bi - e - a

as to which above what

the kings

my fathers

u - sa - ti - ru

wrote

47.

i - na D.P. Na - RA - a as - tu - ur - va

upon a stone tablet

I wrote

and

48.

u - ki - in akh - ra - ta - as

I set up

for future (days)

¹ Var. instead of .

² Var. .

49.
 ka - la e - ip - se - e - ti - ya
 (*The account*) of all my works

50.
 sa i - na D.P. na - RA - a as - tu - ru
 which upon the stone tablet I have written

51.
 mu - da - a - av li - ta - am - ma - ar - va
 (*with*) understanding mayest thou look upon and

52.
 ta - ni - it - ti ilani
 the glory of the gods

53.
 li - ikh - ta as - sa - as
 may he understand

54.
 e - bi - su ma - kha - zi ilani u
 I built the fortress of the gods and

 D.P. Is - tar
 the goddess Istar

55.
 sa bilu ra - be u D.P. Marduk
 of the great lord and Marduk

¹ Var. .

² Var. .

COLUMN III.

1.
 ya - ti u - ma - ra - an - ni - va
As for me he urged me and

2.
 u - sa - at - ka - an - ni li - ib - ba - av
he caused to gather me in heart

3.
 pa - al - khi - is la - a ba - adh - dhi - il - su
reverently, not failing him,

4.
 u - sa - al - la - av si - bi - ir - su
I completed his beautiful (works)

Thus far the account on both cylinders is the same, although the spelling of a word here and there is different. But now the accounts differ entirely, and we give the text from the cylinder that contains the third column in the best state of preservation.

5.
 ni - nu mi - su a - na D.P. SAR AMAR - DA bil - ya
 for the god the king of Marad my lord

6.
 bit - šu sa ki - ri - ib AMAR - DA - DA
his temple which is within Marad,

7.
 sa is - tu yu - um ri - e - ku - u tiv
which from a time (day) remote

14.
 u - ki - in ki - ir - bu - us - su
I placed within it.

15.
 D.P. sar AMAR - DA bil ku - ul - la - at
O God the king of Marad, the lord of all

 ka - ar - dav
the warrior (gods)

16.
 li - bi - it ka - ti - ya a - na da - mi - ik - tiv
to the brickwork of my lucky hands.

17.
 kha - di - is na - ap - li - is - va
joyfully, be favourable and

18.
 ba - la - adh yu - uv ri - e - ku - u - tiv
a life to a day remote

19.
 se - bi - e li - it - tu - u - tiv
sufficiency of glory

20.
 ku - un D.P. kušsu u la - ba - ar
establishment of throne and a length

 pa - li - e
of reign

21.
 a - na si - ri - ik - tiv su - ur - kav
 to eternity lengthen

22.
 si - gi - is la ma - gi - ri
 Sweep away the disobedient

23.
 su - ub - bi - ir kakki - su - un
 shatter their weapons

24.
 khu - ul - li - ik na - ap - kha - ar
 devastate all

 ma - da ai - bi
 the enemy's land

25.
 su - pu - un ku - ul - la - at - su - un
 sweep away the whole of them

26.
 ka - ak - ki - ca e - iz - zu - u - tiv
 thy mighty weapons

27.
 sa la i - ga - am - mi - lu na - ki - ri
 which benefit not my enemies

28.
 lu - u - ti - bu u lu - u - za - ak - tu
 may they draw near and may they sting

29. a - na na - a - ri ai - bi - ya
to the subjugation of my enemies

li - il - li - ku i - da - ai
may they go by my sides

30. i - na ma - kha - ar D.P. Marduk sar
In the presence of the god Marduk king

sa - mi - e u ir - zi - tiv
of heaven and earth

31. e - ip - se - ti - ya su - um - gi - ir
my works make blessed

32. ki - bi tu - um - ku - u - a
command my prosperity

ANALYSIS.

COLUMN I.

2. *rubāv*, subs. sing. masc. Comp. Heb. רֹב, Syr. رُب
nāḏav, adj. sing. Comp. Heb. נָדָד
mīgir, subs. sing. masc. cons. Comp. Heb. יָגַר and גִּיר
to fear.
3. *issākkū*, subs. sing. masc.
narām, Niphal deriv. with softened guttural. Comp.
Heb. נָחַם
4. *Sāccanacu*, 1st sing. Permansive *acu* is a shortened form
from *anacu* (Heb. אָנָכִי).¹ A whole string of verbs of
similar formation occurs in W.A.I. I., 17, 32, thus:—

𒂗𒀭𒂗𒀭𒂗𒀭	<i>šar-ra-cu</i>	I am king
𒂗𒀭𒂗𒀭𒂗𒀭	<i>bi-la-cu</i>	I am lord
𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭	<i>na-ah-da-cu</i>	I am noble
𒂗𒀭𒂗𒀭𒂗𒀭	<i>makh-khu</i>	I am great
𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭	<i>cab-ta-cu</i>	I am honourable
𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭	<i>sur-ra-kha-cu</i>	I am mighty (Heb. סָרַח)
𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭	<i>a-sa-ri-da-cu</i>	I am eldest (the chiefest)
𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭	<i>ur-sa-na-cu</i>	I am prince.
𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭	<i>kar-ra-da-cu</i>	I am warriorlike
𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭	<i>dan-na-cu</i>	I am strong
𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭	<i>zi-ca-ra-cu</i>	I am renowned

Dr. Delitzsch, however, would prefer to read *sāccanacu* as *sāk kanaci*, "prince of the gate," and refers to W.A.I. IV, 16, 58, where the Akkadian 𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭 is equated with the Assyrian 𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭𒂗𒀭 D.P. *ca-na-ci*. But on both cones the last sign is *cu* not *ci*.

¹ See Sayce, *Assyrian Lectures*, p. 93. (Bagster & Co.)

8. *mūstemiku*, Itaphal partic. Comp. Heb. עֲמִיק
sapar, subs. sing. masc. cons. Arab. سَفَر
9. $\text{𐎶𐎵𐎶𐎵} = \text{𐎶𐎵} \text{ 𐎶𐎵}$ *ab-lu*. W.A.I. III, 70, 122.
asaridu. Comp. Chald. שְׂרִידָא, and Syr. ܣܪܝܕܐ.
 “principiūm.”
11. *Marduk*. Occurs in Heb. under the forms מְרַדּוּךְ and
 בְּרַדּוּךְ Syriac ܡܪܕܘܟܐ.
cinis, adverb from *cinu*. Comp. Heb. כִּין.
lu-bānni, 1st sing. Imperative Pael. Literally “build
 me.” Comp. Heb. בְּנֵה.
12. *susubni*, 1st sing. Imperative Shaphel. Comp. Heb. יִשֵּׁב.
rēāv, subs. sing. masc. Heb. רָעָה.
13. *zanān*, subs. sing. cons. Comp. Heb. זָנַן.
ēsrietiv, subs. plu. fem. with mimmation. Comp. Heb.
 אֲשִׁירָה Chald. אֲשִׁירְתָּא and Accad. 𐎶𐎶𐎶𐎶 𐎶𐎶𐎶
 E-ŠARRA.
14. *pālli*, subs. sing. masc. with pron. suffix. Comp. Heb. פָּלַל.
18. *DUR*. Comp. Syr. ܕܪܐ.
usacil, 1st sing. masc. aor. Shaph. Comp. Heb. קָלַל.
 Comp. Chald. שַׁכְּלִיל, Syr. ܡܘܨܠ.
19. *seippi*, subs. sing. masc. Comp. Heb. סִף, Syr. ܣܦܢ.
 “atrium.”
abulli, subs. plu. masc. Chald. ܐܒܘܠܐ.
20. *eikdūtiv*, adj. fem. with mimmation. Comp. Arab. عَكْدَة
 “potentia.”
21. *sezuzūtīm*. Comp. Heb. עֶזוּ.
24. *khiriti*, subs. sing. fem. Heb. חֹרֵר.

25. $\text{𐎶 𐎶} \text{𐎶} = \text{𐎶} \text{𐎶} \text{𐎶}$ *id-da*. W.A.I. IV, 6, 46.

This occurs in many inscriptions of Nebuchadnezzar.

See W.A.I. I, 65, 51. Col. 2, 8. W.A.I. I, 52, 17.

On a brick lost in the Tigris, but printed by Dr. Oppert in his "Exp. Mésop.," p. 257, $\text{𐎶} \text{𐎶}$ was omitted. (Norris' Dict., p. 60.)

libittu. Comp. Heb. לִבְיָהּ.

26. *abāv*, subs. sing. masc. with mimmation. Heb. אָב.

alitu, pres. participle, or "nomen agentis." Heb. יֹלֵד.

Comp. Syr. ܐܠܝܬܐ, "genitor."

usālav, sing. aor. Shaph. Heb. עָלָה.

27. *bususi*, subs. plu. masc. Heb. בָּשַׁם, "to tread."

28. *istenniti*. From Akkadian 𐎶 as "one" and 𐎶 𐎶 𐎶 𐎶 TA-AN, "a measure." Heb. עֶשְׂתִּי.

sanī. Comp. Heb. שָׁנָה, "to do the second time."

31. *isišu*, for *isid-šu*. Comp. Heb. יָסַד.

𐎶 𐎶 CI-GAL, *i.e.*, Hades. The Queen of Hades was called Gula (𐎶 𐎶 𐎶), and she was wife of the God Ea. Another name, Nin-ci-gal, *i.e.*, "Lady of the great Country," was also borne by her in her especial capacity as "Lady of the House of Death."

33. 𐎶 𐎶 𐎶 = 𐎶 𐎶 𐎶 𐎶 𐎶 *e-bir-ti-nāhr*, "the crossing of a river."

35. *arākhktiv*, subs. plu. fem. Heb. אֲרָחָה.

39. *abārti*. Comp. Heb. עָבַר.

urāccīšva, 1st sing. aor. Pael. Heb. רָבַס.

40. *seittätiv*, subs. plu. fem. Comp. Chald. ܐܝܫܬܐ.

41. *yati*. Comp. Heb. אָתִי.

47. *irsitiv*, for *irtsitiv*. Heb. אָרַץ.

51. *khuratsi*, subs. sing. masc. Heb. חֲרוּץ.

COLUMN II.

1. *sipirti*, subs. fem. sing. gen. case. Heb. שִׁפְרָה.
3. *samami*, reduplicated form like *mami*, "waters."
13. *kakarāv*. Dr. Oppert has pointed out that *ammat gagari* signified the square cubit (360 yards).
17. *supul*, subs. sing. masc. Heb. שָׁפַל.
24. *cāri*, subs. sing. masc. Heb. קָרַר. Chald. כְּרָנָא
40. *tedisti*, subs. plu. fem. Comp. Heb. הָדַשׁ "to be new."
sukurātiv. Shaphel derivative. Comp. Heb. יָקַר.
 Chald. אִיקָר, יָקַר.
46. *usatiru*, for *usadhiru*, 1st sing. perf. Heb. שָׁטַר.
51. *mudāv*. Comp. Heb. מוֹדַעַת. Isai. xii, 5.

COLUMN III.

20. *sūrkaḡ*, *sigis*, *sūbbir*, *khullik*, *supūn*, *sūmgir*, and *kibi*, are an interesting collection of imperatives.
28. *lu*, the sign of the precativ, and is to be compared with the Hebrew לֵא and לֵא, O that! would that! let it be! etc. But for a discussion on this point, and a contradiction of the opinions of Prof. Sayce and Dr. Oppert, see Lowe's *Fragment of Talmud Babli Pesachim*. Critical Notes, pp. 1—3. Cambridge, 1879.

ON
FINAL CAUSE.

BY

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*BEING A PAPER READ BEFORE THE VICTORIA INSTITUTE, OR
PHILOSOPHICAL SOCIETY OF GREAT BRITAIN.*

TO WHICH IS ADDED

A PAPER ON STRUCTURE AND STRUCTURELESS.

BY PROFESSOR LIONEL S. BEALE, M.B. F.R.S.

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FINAL CAUSE. By Professor R. L. DABNEY, D.D., LL.D.
(Texas University).

OF the four "causes," or necessary conditions of every new effect, taught by Aristotelians, the last was the "Final Cause," τὸ τέλος, or τὸ οὗ ἕνεκα; "that for the sake of which" this effect was produced. This result, for the sake of which the effect has been produced, is termed "final," because it is of the nature of a designed end; and "cause," in that it has obviously influenced the form or shape given to the result, and the selection of materials and physical causes employed. Final cause thus always involves a judgment adapting means to an end, and implies the agency of some rational Agent.

2. The question: Do any of the structures of Nature evince final cause? is the same with the question: Is the "teleological argument" valid to prove the being of a personal and rational Creator? The essence of that argument is to infer that, wherever Nature presents us with structures, and especially organs adapted to natural ends, there has been contrivance, and also choice of the physical means so adapted. But contrivance and choice are functions of thought and will, such as are performed only by some rational person. And so,

as material Nature is not intelligent or free, such adapted structures as man did not produce must be the work of a supernatural Person. This reasoning has satisfied every sound mind, Pagan and Christian, from Job to Newton. Yet it is now boldly assailed by evolutionists.

3. Some attempt to borrow an objection which Descartes very inconsistently for him, suggested: That "he deems he cannot, without temerity, attempt to investigate God's ends" (*Meditations*, iv. 20). "We ought not to arrogate to ourselves so much as to suppose that we can be sharers of God's counsels" (*Prin. Phil.* i. 28). The argument is, that if there is an intelligent First Cause, He must be of infinite intelligence; whence it is presumptuous in a finite mind to say that, in given effects, He was prompted by such or such designs. We are out of our depth. But the reply is: That this objection misstates the point of our doctrine. We do not presume to say, in advance of the practical disclosure of God's purposes in a given work, what they are, or ought to be; or that we know all of them exactly; but only: That He is prompted in His constructions by some rational purpose. And this is not presumptuous, but profoundly reverential; for it is but concluding that God is too wise to have motiveless volitions! Again, when we see certain structures obviously adapted to certain functions, and regularly performing them, it is not an arrogant, but a supremely reverential inference, that those functions were among God's purposed ends in producing those structures. For this is but concluding that the thing we see Him do is a thing He meant to do!

4. Next, we hear many quoting Lord Bacon against the study of final causes. They would fain represent him as teaching that the assertion of final causes is incompatible with, and exclusive of, the establishment of efficient, physical causes. But, as these latter are the real, proximate producers of all *phenomena*, it is by the study of them men gain all their mastery over Nature, and make all true advances in science. Whence, they argue, all study or assertion of final causes is inimical to true science. Thus, they quote Bacon, as, for instance, in the *Nov. Organum* (lib. i. Apothegm 48): "Yet, the human intellect, not knowing where to pause, still seeks for causes more known. Then, tending after the remoter, it recoils from the nearer; to wit, to final causes, which are plainly rather from the nature of man, than of the Universe; and from this source they have corrupted philosophy in wondrous ways."

5. Now, Lord Bacon's own words prove that he does not condemn, but highly esteems the inquiry after final causes in

its proper place, the higher philosophy and natural theology. He is himself a pronounced Theist, and infers his confident belief in God from the teleological argument. The whole extent of his caution is, that when the matter in hand is physical, and the problem is to discover the true, invariable, physical efficient of a class of *phenomena*, we confuse ourselves by mixing the question of final cause. Thus, in the *Advancement of Learning*, he himself divides true Science into physical and metaphysical; the former teaching the physical efficient of effects; the latter, under two divisions, teaching: 1. The Doctrine of Forms. 2. The Doctrine of Final Causes. And this third, culminating in theology, he deems the splendid apex of the pyramid of human knowledge.

6. In the second book of his work on the *Advancement of Learning*, he says:—"The second part of Metaphysics is the inquiry into final causes; which I am moved to report not as omitted, but as misplaced." (He then gives instances of propositions about final causes improperly thrust into physical inquiries.) "Not because those final causes are not true, and worthy to be inquired, being kept within their own province; but because these excursions into the limits of physical causes have bred a vastness and solitude in that track. For, otherwise, keeping their precincts and borders, men are extremely deceived if they think there is an enmity or repugnancy between them."

7. In fact, the two imply each other. If there is a God pursuing His purposed ends, or final causes, He will, of course, pursue these through the efficient, physical causes. It is the very adaptation of these to be right means for bringing God's ends, under the conditions established by His providence, which discloses final causes. It is the physical cause,—gravity,—which adapts the clock-weight to move the wheels and hands of the clock. Shall we, therefore, say it is contradictory to ascribe to the clock, as its final cause, the function of indicating time? Does the fact that the physical cause,—gravity,—produces the motions weaken the inference we draw from the complicated adjustments, that this machine had an intelligent clockmaker? No; the strength of that inference is in this very fact, that here, the blind force of gravity is caused to realise an end so unlike its usual physical effects in the fall of hail-stones and rain-drops, of leaves and decayed branches.

8. The evolutionist says, then, that since the physical cause is efficient of the effect, this is enough to account for all actual results, without assigning any "final cause." The *lens*, for instance, has physical power to refract light. If we find a

natural *lens* in a human eye, we have a sufficient cause to account for the formation of the *spectrum*, the function from which theists infer their final cause; and the logical mind has no need to resort to a theory of "contrivance" and "final cause" for this organ. Function is not the determining cause, but only the physical result of the existence of the organ. Birds did not get wings in order to fly; but they simply fly because they have wings. As to the complex structures called organs, the evolutionist thinks his theory accounts for their existence, without any rational agent pursuing purposed ends. That just this configuration of a universe, with all its complicated structures, is physically possible (i.e. possible as the result of physical causes), is sufficiently proved by the fact, that it exists as it is. For theists themselves admit that it is the physical causes which contain the efficient causation of it. These are, as interpreted by evolutionists, slight differentiations from the parent types, in natural reproductions (variations which may be either slightly hurtful to the progeny, slightly beneficial, or neutral): the plastic action of environment in developing rudimental organs, and the survival of the fittest. Allow, now, a time sufficiently vast for these causes to have exhibited, countless numbers of times, all possible variations and developments; under the rule of the survival of the fittest; the actual configurations we see may have become permanent, while all the agencies bringing them to pass acted unintelligently and fortuitously.

9. Such, as members of this Institute well know, is the latest position of anti-theistic science, so called. The whole plausibility is involved in a confusion of the notions of fortuity and causation. This we now proceed very simply to unravel. The universal, necessary, and intuitive judgment, that every effect must have an adequate cause, ensures every man's thinking that each event in a series of *phenomena* must have such a cause preceding it, however we may fail in detecting it. In this sense, we cannot believe that any event is fortuitous. But the concurrence or coincidence of two such events, each in its place in its own series caused, may be thought by us as uncaused, the one event by the other or its series, and thus the concurrence, not either event, may be thought as truly fortuitous. Thus, the coincidence of a comet's nearest approach to our planet, with a disastrous conflagration in a capital city, may be believed by us to be, so far as the concurrence in time is concerned, entirely by chance. We no longer believe that comets have any power to "shake war, pestilence or fire from their horrent hair," on our earth. Yet we have no doubt that a physical cause propels that comet in its orbit

every time it approaches the earth; or that some adequate local cause wrought that conflagration in the metropolis. But now, suppose this coincidence of the comet's *perigee* and the conflagration should recur a number of times? The reason would then see, in the frequency and regularity of that recurrence, a *new phenomenon*, additional to the individual ones of comet and fire; a new effect as much requiring its own adequate cause, as each of these demands its physical cause. This regular recurrence of the coincidence is now an additional fact. It cannot be accounted for by fortuity. Its regularity forbids that supposition. The physical cause of each event, comet's approach and conflagration, is adequate, each to the production of its own effect. But the new effect to be accounted for is the concurrence. This is regular; but we know that the sure attribute of the results of blind chance or fortuity is uncertainty, irregularity, confusion. The very first recurrence of such a coincidence begets a faint, probable expectation of a new, connecting cause. All logicians agree that this probability mounts up, as the instances of regular concurrence are multiplied, in a geometric ratio; and when the instances become numerous, the expectation of an additional coördinating cause becomes the highest practical certainty. It becomes rationally impossible to believe that these frequent and regular concurrences of the effects came from the blind, fortuitous coincidence of the physical causes, acting, each, separately from the other.

10. The real case, then, is this. Each physical cause, as such, is only efficient of the immediate, blind result next to it. Grant it the conditions, and it can do this one thing always, and always as blindly as the first time. Gravity will cause the mass thrown into the air to fall back to the earth, to fall anywhere, or on anything, gravity neither knowing nor caring where. But here are several batteries of cannon set in array to break down an enemy's wall. What we observe as fact is, that the guns throw solid shot convergently at every discharge, upon a single fixed spot in the opposing curtain, with the evident design to concentrate their force and break down one chasm in that wall. Now, it is a mere mockery to say that, given the cannon and the balls, the explosive force of gunpowder, and gravity, the fall of these shots is accounted for. These physical causes would account for their random fall, anywhere, uselessly, or as probably upon the heads of the gunners' friends. The thing to be accounted for is their regular convergence. This is an additional fact: the blind physical causes do not and cannot account for it,—it discloses design.

11. The human eye, for instance, is composed of atoms of oxygen, hydrogen, carbon, nitrogen, with a few others of

phosphorus and lime. Chemical affinity may arrange an ounce or two of these atoms into a compound, which may be, so far as any determination of that blind cause goes, of any shape or amorphous, fluid or solid, useful, useless or hurtful to sensitive beings. But here are countless millions of reptiles, birds, quadrupeds and men, creatures designed to live in the light and air, of whom the men number twelve hundred millions at least, in each individual of whom there is a pair of eyes except in the imperfect births. Numerous and exceedingly delicate adjustments were necessary in each separate eye, to effectuate the end of an eye—vision. The pupil must open on the exterior front, and not somewhere within the socket; the interior of the ball must be a *camera obscura*. There must be refracting, transparent bodies, to bend the rays of light; achromatic refraction must be produced; focal distances must be adjusted aright; there must be a sensitive sheet of nerve to receive the *spectrum*; the sensation of this image must be conveyed by the optic chords to the *sensorium*; the animal's perceptive faculty must be coördinated as a cognitive power to this sensorial feeling; the brow and lids must be contrived to protect the wondrous organ. Here, already, is a number of coincidences, and the failure of one would prevent the end—vision. Let the probability that the unintelligent cause, chemical affinity, would, in its blindness, hit upon one of these requisites of a seeing eye, be expressed by any fraction, we care not how large. Then, according to the established law of logic, the probability that the same cause will produce a coincidence of two requisites is found by multiplying together the two fractions representing the two separate probabilities. Thus, also, the joint concurrence of a third has a probability expressed by the very small fraction produced by multiplying together the three denominators. Before we have done with the coördinations of a single eye, we thus have a probability, almost infinitely great, against its production by physical law alone. But in each head are two eyes, concurring in single vision, which doubles the almost infinite improbability. It is multiplied again by all the millions of the human and animal races. But this is not all. To say nothing of the coincidence of means in inorganic and vegetable nature, there are in animals many other organs besides eyes, which, if not as complicated, yet exhibit their distinct coördinations. These must multiply the improbability that fortuity produced all the former results! Thus the power of numbers and the capacity of human conceptions are exhausted before we approach the absurdity of this theory of the production of ends in nature without final cause.

12. We look, then, at these combinations of means to results or functions, which unintelligent physical causes could not account for; and we perceive this farther fact. Adjustments or coördinations are regularly made, in order to certain ends. The nature of the end proposed has determined the nature of the physical means selected, and the combination thereof. Thus: as the ship is evidently designed and purposed for sailing, so is the ear for hearing, and the eye for seeing. The function of sailing has determined the materials and structure of the ship: the function of hearing those of the ear: the function of seeing those of the eye. But the ship-building must be before the sailing: the ear and eye must exist before the hearing and seeing. The facts which we have, then, are these: Here are ends, coming after their means, which yet have acted causatively on their own precedent means! But every physical cause precedes its own effect. No physical cause can act until it exists. Here, however, are ends, which exercise the influence of causes, and yet, against all physical nature, are causes before they have existence, and act backwards up the stream of time! Here is the function of sailing, which has effectively caused a given structure in a ship-yard, before this function was.

13. To solve this paradox, there is only one way possible for the human mind. There must have been *prescience of that future function*. It is impossible that it can have acted causally, as we see it act in fact, except as it is foreseen. But foresight is cognition; it is a function of intelligence; it cannot be less. A mind has been at work, pre-conceiving that function and the things requisite to it, choosing the appropriate means, purposing the effective coördinations therefor, and thus shaping the work of the physical causes. *This is "final cause."*

14. There is one sphere, within which the mind has intuitive and absolute knowledge of the working of final causes, as every atheist admits. This is the sphere of one's own consciousness and will. The man knows that he himself pursues final causes, when he conceives and elects future ends, selects means, and adapts them to his own purposed results. But is he not equally certain that his fellow-man also pursues final causes? Doubtless. It is instructive to inquire how he comes to that certainty as to his fellow's soul. He has no actual vision of that other's subjective states! Men have no windows in their breasts into which their neighbours peep, and actually see the machinery of mind and will moving. But this man knows that his fellow is pursuing final causes generically like those he consciously pursues himself; because

he observes the other's outward acts, and infers final causes in the other's mind, from the great mental law of "like causes, like effects," by an induction guided by the perfect, visible analogy.

15. But when we observe, in nature, these visible actions exactly analogous to combinations seen in our fellow-man when he pursues his final causes: why do not the same analogy and induction justify us in ascribing the same solution; that there are final causes in nature also? Why is not the one induction as valid as the other? There is no difference. It is vain to object, that whereas we see in our fellow a rational person; we see in nature no personality, but only sets of material bodies and natural causations. For it is not true that we *see* in our neighbour a rational person, competent to deal with final causes. His soul is his personality! And this is no more directly visible to us than God is visible in nature. What we see in our neighbour is a series of bodily actions executed by members and limbs, as material as the physical organs of animals: it is only by an induction from a valid analogy between his acts and our own, that we learn the rational personality behind his material actions. The analogy is no weaker, which shows us God's personality behind the final causes of nature. The question returns: Why is it not as valid?

16. Is a different objection raised: That man's pursuit of his final causes is personal and consciously extra-natural, exercised by personal faculties acting from without upon material nature; while the powers which operate everything in nature are immanent in nature? The replies are two: First, in the sense of this discussion, human nature is not extra-natural, but is one of the ordinary spheres of nature, and is connected with the lower spheres by natural laws as regular as any. When the personal will of a man pursues a final cause, he does it through means purely natural: there is, indeed, a supra-material power at work, coördinating mind; but nothing extra-natural or supra-natural appears. Why, then, may we not press an analogy so purely natural through all the spheres of nature? Second: our opponents [Evolutionists, or Materialists, or Agnostics] refute themselves fatally; for they are the very men who insist on obliterating even that reasonable distinction which we make between the material and mental spheres. They plead for *monism* in some form: they deny that mind and matter are substantively distinct; they insist on including them in one theory of substance and force. They have, then, utterly destroyed their own premise, by denying the very distinction between personal mind and

nature, on which alone their objection rests. On their ground, our analogical induction for final cause in nature is a perfect proof. They admit that our minds consciously pursue final causes. But mind and physical nature, say they, are manifestations of the same substance and force. Hence, when we see the parallel coördinations of physical causes to future ends in nature, just like those we consciously employ; there is no other inference possible, but that nature, like us, pursues final causes.

17. The exception of Hume and his followers of our generation is already virtually answered. He cavilled that the inference from our conscious employment of final causes to the same fact in nature is unsound, because of the difference between a person and a natural agency. Mr. Mill has echoed the cavil, while completely refuting it in another place.* Mr. H. Spencer has reproduced it in the charge that the inference labours under the vice of *anthropomorphism*; that it leaps from the conscious experience of our limited minds to an imaginary acting of an infinite mind (if there is any divine mind), about which we can certainly know nothing as to its laws of acting; and it unwarrantably concludes that this absolute Being chooses and thinks as we finite, dependent beings do. The *argumentum ad hominem* just stated would be a sufficient reply. Or we might urge that, if God has made the human mind "after His image, in His likeness," this would effectually guarantee all our legitimately rational processes of thought against vice from *anthropomorphism*. For, in thinking according to the natural laws of our minds, we would be thinking precisely as God bids us think. And, should Mr. Spencer say that we must not "beg the question" by assuming this theistic account of man's origin, we might at least retort, that neither should he beg the question by denying it. We might also urge, that the difference between the normal acting of a finite mind, and of an infinite one, can only be a difference of degree, not of essence; that the thinking of the finite, when done according to its laws of thought, must be good as far as it goes; only, the divine thinking, while just like it within the narrow limits, goes greatly farther. Sir Isaac Newton knew vastly more mathematics than the school-child; yet, when the school-child did its little "sum" in simple addition, "according to rule," Newton would have pronounced it right; nor would he have done that "sum" in any other than the child's method! Once more; the unreasonableness of the demand, that we

* *Theism*, part i., "Marks of Design in Nature."

shall reject any conception of the divine working, though reached by normal (human) inference, merely because it may be anthropomorphic, appears thus. It would equally forbid us to think or learn at all, either concerning God, or any other Being or concept different from man: for, if we are not allowed to think in the forms of thought natural and normal for us, we are forbidden to think at all. All man's cognition must be anthropomorphic, or nothing.

18. But the complete answer to these exceptions is in the facts already insisted on: that, in reasoning from "finality" in nature, to "intentionality," we are but obeying an inevitable necessity; we are not consulting any peculiarity of human laws of thought. In the operations of Nature, just as much as in our own consciousness, we actually see ends which follow after their physical efficient, exerting a causal influence backward, before they come into existence, on the collocations of their own physical means, which precede. There is no way possible in physical nature by which a cause can act before it is. The law of physical causation is absolute; a cause must have existed in order to operate. Hence we are driven out of physical nature to find the explanation of this thing,—driven, not by some merely human law of thought, but by an absolute necessity of thought. The final cause which acted before it existed, must have pre-existed in forethought. Forethought is a function of mind. Therefore, there must be a Mind behind nature, older and greater than all the contrivances of nature. A great amount of thinking has been done in the finalities of nature. Who did that thinking? Not nature. Then God. The only alternative hypothesis is that of chance. We have seen that hypothesis fall into utter ruin and disgrace before the facts.

19. Were all the claims of the Evolutionist granted, this would not extinguish the teleological argument, but only remove its *data* back in time, and simplify them in number. For then, the facts we should have would be these: a few, or possibly one primordial form of animated matter, slowly, but regularly, producing all the orderly wonders of Life, up to man, through the sure action of the simple laws of slight variation, influence of environment, survival of the fittest. Here, again, are wonderful adaptations to ends! And chance would equally be excluded by the numbers, the regularity, the beneficence of the immense results. The problem would recur:—Who adjusted those few but ancient elements so as to evolve all this? Teleology is as apparent as ever. We may even urge, that the distance, the multitude, the complex regularity

of the later effects which we now witness, illustrate the greatness of the thinking but the more. The justice of this point may appear from the fact, that there are Theistic evolutionists who make the very claim just urged. They advance the evolutionist theory, and in the same breath they stoutly assert that in doing so they have not weakened, but improved the grounds of the teleological argument. However, we may judge their concession of this improved theory of evolution to be unwise and weak; this other assertion is solid, that they are no whit inferior in knowledge or logic to their atheistic comrades and co-labourers, who pronounce the teleological argument dead.

20. The attempt to account for structures adapted to functions by evolution, has no pretence, even, of applying, except in organised beings which perpetually reproduce their kinds. For it is the claim of slight variations in generation, and of the fuller development of nascent new organs by the reaction of environment, which form the "working parts" of the theory. But clear instances of finality are not confined to these vegetable and living beings. There are wondrous adaptations in the chemical facts of inorganic nature, in the mechanism of the heavenly bodies, in the facts of meteorology. Here, then, their speculation breaks down hopelessly. Have suns and stars, for instance, attained to their present exquisite adjustments of relation, and perfection of being, by the blind experiments of countless reproductions? Then, the fossil-suns, unfitted to survive, ought to lie about us as thick as fossil polypi and mollusks!

21. The claim, that a blind *conatus* towards higher action felt in the animal may have assisted the plastic influence of environment from without in developing rudimental organs, cannot assist the evolutionists. They differ among themselves as to the mode of such influence; they contradict each other. Natural history fatally discredits the claim by saying, that the organ must be possessed by the species of animals, before any of them could feel any *conatus* towards its use. Can seeing be before eyes, even in conception? No. How, then, could eyeless animals feel any *conatus* to see? Let no one be deluded by the statement that a blind boy among us may feel a yearning to see. He is a defective exception in a seeing species, who do crave to see because they already have eyes; and who suggest to their blind fellow the share in this desire by the other faculty of speech. It still remains true, that the species must have eyes beforehand, in order that individuals

may experience a *conatus* for seeing. But the case to be accounted for would be the beginning of such *conatus* in some individual of a species, none of which had the organ for the function, and in which, consequently, none had even the idea of the function or its pleasures as the objective of such desire. If they resort to the assertion that this *conatus* towards a function may be instinctive and unintelligent, the fatal answers are:—That their own sciences of zoology and physiology assure us that instincts are not found in cases where the organs for their exercise do not exist: And that an instinctive *conatus*, being blind and fortuitous, would never produce results of such regularity and completeness, and those, exactly alike in each of the multitudes of a species.

22. But the most utter collapse of the attempt to explain the finalities of Nature by the laws of a supposed evolution, occurs when we approach those classes of organs, which complete their development while the influences of environment and function are entirely excluded; and these are exceedingly numerous. The fowl in the shell has already developed wings to fly with, in a marble case which excluded every atom of air, the *medium* for flying. So, this animal has perfected a pair of lungs for breathing, where there has never been any air to inhale. It has matured a pair of perfect eyes to see with, in a prison where there has never entered a ray of light. It has an *apparatus* of nutrition in complete working order, including the interadjustments of beak, tongue, swallow, craw, gizzard, digestivestomach, and intestine; although hitherto its only nutrition has been from the egg which enclosed it; and this has been introduced into its circulation in a different manner. This instance of the fowl has been stated in detail, that it may suggest to the hearer a multitude of like ones. The argument is, that physical causes can only act when in juxtaposition, both as to time and place, with the bodies which receive their efficiency. But here, environment and function were wholly absent until the results,—wings, eyes, ears, lungs, alimentary canal, were completed. Therefore, they had no causal connection whatever as physical causes. Their influence could only have been as final causes.

23. Perhaps the deepest mysteries and wonders of Nature are those presented in the functions of reproduction. And to these Nature attaches her greatest importance, as she shows by many signs, seeing the very existence of the *genera* and *species* depend on this. The organs of reproduction present instances most fatal to our opponents, in all those cases where the male organs are in one individual, and the female in a

different one of the same species ; and where their development is complete before they either can or do react upon each other in any manner. These instances not only include the great majority of the animal species, but many kinds of plants and trees ; or, at least, different flowers of the same tree. The organs are exceedingly unlike each other, yet exactly adapted for future co-operation. This fitness is constituted not only by structure of masses, but by the most refined and minute molecular arrangements. If either of these delicate provisions is out of place, Nature's end is disappointed. Must not these organs be constructed for each other ? Yet the reaction of environment had no influence on their development ; for all interaction has been excluded until the maturity of the structures. Final cause is here too clear to admit of doubt when the cases are duly considered.

24. The argument will close with these general assertions. Our conclusion has in its favour the decided assent of the common sense of nearly all mankind, and of nearly all schools of philosophy. All common men of good sense have believed they saw in the adjustments of the parts of nature to intended functions, final causes and the presence of a supernatural mind. The only exceptions have been savages like the African Bushmen, so degraded as to have attained to few processes of inferential thought on any subject. All speculative philosophers have been fully convinced of the same conclusion, from Job to Hamilton and Janet, except those who have displayed eccentricity in their philosophy, either by materialism, ultra-idealism, or pantheism. This *consensus* of both the unlearned and the learned will weigh much with the healthy and modest reason.

25. The postulate that each organ is designed for an appropriate function is the very pole-star of all inductive reasoning and experiment in the study of organized nature. At least, every naturalist proceeds on this maxim as his general principle ; and if he meets instances which do not seem to conform to it, he at once discounts them as *lusus naturæ*, or reserves them for closer inquiry. When the botanist, the zoologist, the student of human physiology, detects a new organ, not described before in his science, he at once assumes that it has a function. To the ascertainment of this function he now directs all his observations and experiments ; until he demonstrates what it is, he feels that the novelty he has discovered is unexplained ; when he has ascertained the function, he deems that he has reduced the new discovery into its scientific place. Without the guidance of this postulate of adapted function for each organ, science would be paralysed, and its order would become

anarchy. The instances are so illustrious, from Harvey's inference by the valvular membranes in the arteries to a circulation of the blood, down to the last researches of zoology and botany, that citation is needless for the learned. But this postulate is precisely the doctrine of final cause.

26. Belief in final cause is the essential counterpart to, and immediate inference from, the belief in causation. But this is the very foundation of inductive logic. There is no physicist who does not concur with us in saying, that all induction from instances observed to laws of nature is grounded in the "uniformity of nature." But has this nature any stable uniformity? Is not her attribute variation and fickleness? The first aspect of her realm is mutation, boundless mutation. Or, if she is found to have, in another aspect, that stability of causation necessary to found all induction; how comes she, amidst her mutabilities, to have this uniformity? Her own attributes are endless change, *and blindness*. Her forces are absolutely unintelligent and unremembering. No one of them is able to know for itself whether it is conforming to any previous uniformity or not: no one is competent to remember any rule to which it ought to conform. Plainly, then, were material nature left to the control of physical laws alone, she must exhibit either a chaotic anarchy or the rigidity of a mechanical fate. Either condition, if dominant in nature, would equally unfit her to be the home of rational free agents, and the subject of inductive science. Let the hearer think and see. Nature is uniform, neither chaotic nor fatalistic, because she is directed by a Mind, because intelligence directs her unintelligent physical causes to preconceived, rational purposes. Her uniformities are but the expressions of these purposes, which are stable, because they are the volitions of an infinite, immutable Mind, "whose purposes shall stand, and who doeth all His good pleasure," because all His volitions are guided, from the first, by absolute knowledge and wisdom, perfect rectitude, and full benevolence. Nature is stable, only because the counsels of the God, who uses her for His ends, are stable.

None but theists can consistently use induction.

The CHAIRMAN (D. HOWARD, Esq., Vice-President Chemical Society).—We have in the first place to thank the author of this paper, whom we would gladly have welcomed among us, had he been able to leave his distant home. Having been a quarter of a century ago a very distinguished soldier, he has since added to that distinction the further claim upon our recognition which belongs to his position as a professor and deep thinker. It may seem strange that after all these years of discussion we should still have to go back to so elementary a matter as the causes which Aristotle classed

as first causes. And yet there are few things which create so much discussion as the question of first cause. I once heard a distinguished lawyer ask a distinguished physician, in cross-examination, what was the cause of a man's illness, and the physician replied, "If you will tell me what you mean by 'cause,' I will answer the question." The lawyer, however, thought better of it, and the question was not answered; and we were consequently cheated out of a very important discussion. Doubtless, the barrister was astute enough to know that most men would have fallen into the trap he had laid, and, in describing the cause of the man's illness, have afforded a chance for a clever rejoinder. And so it is in the matter before us. We see men entirely ignoring the very ancient distinction between the different causes by confusing, under the common term "causes," all those which Aristotle, if not the first to draw attention to, was undoubtedly the first to classify. The more we pursue the question the more evident it is that, take what view we may of creation, whether we consider the present state of things to have been brought about by evolution, or by a mere single act of creation, we are just as much unable to escape from the argument of final cause in the one case as in the other. We are, in fact, unable to free our minds from the belief that there has been a distinct purpose in nature. It is, I believe, perfectly true that there is nothing in the belief in evolution to prevent a full and complete belief in a final power and creative cause, though I quite share the author's view of the very incomplete proof of the universality of evolution. Therefore, this question of final cause is by no means one which it is needless to discuss in these days. It is not one, I think, which has been so thoroughly thrashed out that there is no necessity to say any more upon it. There are, however, many here who I believe are well able to discuss the subject, and I hope they will give us the benefit of their thoughts upon it.

Mr. HASTINGS C. DENT, C.E., F.L.S.—In offering a few remarks on this subject, I would first of all say that there have been few papers read in this room to which I have listened with deeper interest; and I cannot but regard it as a most important contribution to the transactions of this Society. I propose to confine my remarks to a few criticisms, and I may say that there are many points in the paper which are so very clear and plain that I might almost call them axioms. I will draw attention to some half dozen of these, and the first to which I would refer relates to contrivance and choice. In section 2, the author says, "Wherever nature presents us with structures, and especially organs, adapted to natural ends, there has been contrivance, and also choice of the physical means so adapted. But contrivance and choice are functions of thought and will, such as are performed only by some rational persons." There is a very admirable illustration of this given in section 7. It is not the old idea of Paley about the watch, but rather an enlargement of that idea. The author says, "Here the blind force of gravity is caused to realise an end so unlike its usual physical effects in the fall of hail-stones and rain-drops, of leaves and decayed branches."

Then I come to axiom No. 2, which is to be found in section 8. The author says, "Function is not the determining cause, but only the physical result of the existence of the organ. Birds did not get wings in order to fly; but they simply fly because they have wings." In the same way, we are told in paragraph 12, "Adjustments, or coördinations, are regularly made in order to certain ends;" and again, on the same page, "As the ship is evidently designed and purposed for sailing, so is the ear for hearing and the eye for seeing." Axiom No. 3 is given in section 9, where the author says, "We know that the sure attribute of the results of blind chance or fortuity, is uncertainty, irregularity, confusion;" and then we have axiom No. 4, a little further down, "It becomes rationally impossible to believe that these frequent and regular concurrences of the effects came from the blind, fortuitous coincidence of the physical causes, acting each separately from the other." Again, in the concluding part of section 17, we are told, "The difference between the normal acting of a finite mind and of an infinite one can only be a difference of degree, not of essence;" and then we have an analogy between the child's sums and those of Sir Isaac Newton. The fifth axiom is to be found at the end of paragraph 20, where the author confutes the theory of gradual evolution, or the doctrine of organisms obtaining perfection. Here the author gives us a splendid specimen of analytical reasoning, by citing the case of the sun and the stars, as to which he says, "Have suns and stars, for instance, attained to their present exquisite adjustments of relation and perfection of being by the blind experiments of countless reproductions? Then, the fossil suns, unfitted to survive, ought to lie about us as thick as fossil polypi and mollusks." There is one more axiom. It appears at the end of section 21:—"Their own sciences of zoology and physiology assure us that instincts are not found in cases where the organs for their exercise do not exist." May I be allowed, very humbly, to take exception to one item in section 22? I would venture to suggest that the argument there employed is weak, because it can be so easily controverted or answered by the evolutionists. The author says, "The most utter collapse of the attempts to explain the finalities of nature by the laws of a supposed evolution occurs when we approach those classes of organs which complete their development while the influences of environment and function are entirely excluded, and these are exceedingly numerous." He then refers to the fowl in the egg, as obtaining all its different organs necessary for the consumption of food, and the other needs of its being. Now, the evolutionist would say the fowl has merely inherited organs which are transmitted in the egg, and that, consequently, improvement or degeneration takes place after the animal has emerged from the egg-shell; every creature becoming more complex as the embryonic stage becomes more complicated. I do not know any creature that emerges from an egg without possessing some organs which it could not use while in the egg.

Rev. J. WHITE, M.A.—May I take the liberty of offering a few remarks?

I think that, even if we admit all the evolutionists lay claim to, nevertheless, the teleological argument—that of a final cause for the existence of a rational and intelligent Creator—still remains unanswered. Evolution only accounts for the existence of the universe as a going machine, successive generations and variations being continually produced, and those generations being perpetuated in a manner beneficial to the creatures generated. I say, admitting all this as an explanation of the natural history of the universe, it still fails to exclude the teleological argument that the creatures which exist must have had the power of variation bestowed upon them. The creature is put into an environment which enables it to fulfil its functions and to bring about the results we witness; but all this implies design and purpose. It is what could not have occurred by chance or accident. Therefore, I think, material evolution does not militate against the belief we entertain, and that it is rational to entertain, as to the universe having been created by a God who had in view the perfection of the creatures by which it is inhabited. Evolution is to be regarded simply as one of the means by which this perfection and improvement have been brought about. In point of fact, the whole argument brought by the evolutionists against theism, seems to me very like the old illustration which, in accounting for the movement of a watch, went back to the spring and left the origin of that part of the machinery unexplained. These scientific theorists attempt to explain the existence of the universe without a Creator. They merely explain some of the processes, but fail altogether to touch their origin. It is a very remarkable thing how completely all the efforts of human science have failed to explain the origin of anything. Professor Max Müller has pointed out that all the attempts to explain the beginning of any language have utterly failed, and that there is not the slightest prospect of our obtaining such knowledge. He adds the remark, that the human intellect seems equally to fail in ascertaining the beginning of everything else. Therefore, I cannot think that the argument for evolution—although I admit evolution to be true as far as it accounts for a considerable number of steps in the process by which the creatures of the universe have been improved—does dispose of the teleological argument for a final cause, which the author of this paper has put before us in so admirable a manner.

MR. DENT.—I should like to ask the last speaker whether he accounts for the appearance of man by evolution?

REV. J. WHITE.—My argument was only that, admitting evolution to be entirely proved, and that it could be shown that man was descended from an ape or a tadpole, still this does not do away with the teleological argument that there is design in nature, and that generation is only a means by which it is worked out.

MR. DENT.—Does not that go against the statement of Genesis?

REV. J. WHITE.—I only say, *supposing* the case of the evolutionist to be admitted, still it does not militate against, nor upset, the argument advanced in the paper. This was what I intended to express.

Captain FRANCIS PETRIE (Hon. Sec.).—I have received the following communication from Surgeon-General C. A. Gordon, M.D., C.B., who is unavoidably prevented from being present.

Physical causes are the real proximate producers of all phenomena, sec. 4.

But the fact that they are so leaves the *ultimate cause* of those phenomena unexplained. For example, a match applied to gunpowder is the *immediate cause* of an explosion. But the *why* of this result is not explained by the occurrence of the explosion.

In physiology we know that each organ in the body performs its own definite function, and none other; also, that the several functions of organs are influenced by immaterial causes, as the emotions, &c. The fact we know; the why remains mysterious and unknown.

And so with particular causes of diseases, and action of drugs employed in treatment. The fact that definite effects follow the causes and the drugs is matter of actual experience. The why,—that is, the ultimate cause, in the one case as in the other,—is unrevealed.

Materialists assert that the phenomena of mind differ rather in degree than in kind from the phenomena of matter.

As a matter of fact, as little is known of the ultimate and occult properties of matter as there is known of the corresponding properties and faculties of mind. As expressed by Baxter—"Men who believe that dead matter can produce the effects of life and reason, are a hundred times more credulous than the most thorough-paced believer that ever existed."

The CHAIRMAN.—I wish the author had been here to have answered the friendly criticisms that have been made upon his paper. The point to which our attention has been called in regard to the answer of the evolutionist as to the formation and growth of the fowl in the egg, points to one of those curious things that have always passed my comprehension. It is assumed, undoubtedly for a very good reason, as we see that such is the case in nature, that the influence of heredity is an immense power; but what right have we, from the theory of pure natural selection, to assume anything of the kind? What right have we to assume that extraordinary persistency of type which is one of the most remarkable characteristics of all animals? Granting, for the sake of argument, that the peculiar transformations undergone by the embryo are a proof of the past history of the race, how can we, from the characteristics before us, form a conclusion as to the cause of this? But there is, of course, the other possible explanation, that those singular points which are appealed to as evidences of past history, are evidences, not of past history, but of the present position of the animal in the scheme of creation. This is as much in favour of the teleological point of view as it is in favour of the evolutionist. We have to thank the author for a most interesting paper.

Mr. D. M'LAREN.—In section 20 of the paper, the author speaks of the "wondrous adaptations in the chemical facts of inorganic nature, in the mechanism of the heavenly bodies, in the facts of meteorology," the slightest

derangement of which would be fatal to the whole of the existing animal creation. Have the evolutionists attempted to notice or explain the adjustment of the masses, and forces, and distances of the heavenly bodies, as bearing on the argument in favour of teleology?

The CHAIRMAN.—As far as my reading goes, there is absolutely no modern argument in that direction. Undoubtedly, a few centuries back the alchemists gave us a most interesting history of the evolution of matter, and Paracelsus gave us certain speculations which are not looked upon with respect by modern scientists, but form a curious parody of some forms of modern thought.

Mr. G. WISE.—We find in the amoeba that which corresponds to digestion, reproduction, and many of the functions of highly organised creatures like ourselves. I have been reading the introductory chapter to Foster's *Physiology*, and he there very beautifully shows that function precedes organisation, while a great German physiologist says that organs are simply the localisation of functions. I should like to know whether that is true or not?

The CHAIRMAN.—I wish some able physiologist were here to answer that question. For my part I think there is a good deal more of organisation in the amoeba than the microscope will show. The differentiation of protoplasm is not to be measured by our powers of perception.

Mr. WISE.—It is said that they are jellies which are purely transparent. Can we in that case discern anything corresponding to organisation?

The CHAIRMAN.—If an apparently perfectly structureless piece of jelly performs functions, is not that a proof of organisation? *

The meeting was then adjourned.

* Professor Lionel Beale, M.B., F.R.S., has kindly added a paper entitled "Notes on Structure and Structureless."

REMARKS ON THE FOREGOING PAPER, BY THE REV. R. COLLINS, M.A.

I am much indebted to the honorary secretary for sending me a proof of Dr. Dabney's paper. It seems to me to be the most lucid and closely reasoned essay upon the subject that I have read.

It is instructive to observe how difficult it is for the evolutionists, though they discard the doctrine of final causes, to escape its practical dominancy over their reasonings and methods. In their search after modifications in the structure and functions of plants and animals, they are guided, equally with Harvey, by the idea of some *object* to be accomplished. The evolutionist writes as though Nature were always working up to *quasi*-final causes, though his theory is that no such direct cause exists, there being no intelligence to plan such intention. Nature accomplishes what would be accomplished by an intelligence having an intention in view, and on the same lines, only by a different method, namely, that wherever Nature by any adventitious accidental change hits upon that which will give a plant or animal a better chance in the struggle for existence, that better chance, to be followed by an infinite number of better chances (though why so followed we are not clearly told), establishes a new dynasty. The result in the new dynasty is such as would be obtained by intelligent design. Thus the language of design is continually used. For instance (to take up the first evolution article that comes to hand, Mr. Grant Allen's *Dispersion of Seeds*, in *Knowledge*, November, 1885), we read, "This very sedentary nature of the plant kind renders necessary all sorts of curious devices and plans, on the part of parents, to secure the proper start in life for their young seedlings. Or rather, to put it with stricter biological correctness, it gives an extra chance in the struggle for existence to all those accidental variations which happen to tell at all in the direction of better and more perfect dispersion." Now here the first intuition of the mind is towards "devices and plans," which then is immediately corrected by the superior "accident" theory. If "*accidental variations, which happen to tell*" in the direction of more perfect establishment, really produce what would be produced by a wise design, why should we refuse to believe the design, and choose the incomparably more difficult theory that "*accidental variations*" alone, "*that happen to tell,*" have accomplished precisely what design would accomplish? What scientific advantage has the "*accidental variations*" theory over the final cause, which is, after all, practically admitted? How design has worked is another matter. Its method may be a perfectly legitimate subject of inquiry. It may have worked, perhaps, in part by variations in plants and animals. But when I speak of variations as "*accidental,*" what do I really

mean by "accidental"? Have I any proof that what seems to me to be accidental is not the result of some law or some intention? Professor Huxley seems to imply such a law or laws, and to deny anything actually accidental, when he says, "The whole world, living and not living, is the result of the mutual interaction, according to definite laws, of the forces possessed by the molecules of which the primitive nebulosity of the universe was composed." "If this be true," he goes on to say, "it is no less certain that the existing world lay, potentially, in the cosmic vapour, and that a sufficient intelligence could, from a knowledge of the properties of the molecules of that vapour, have predicted, say the fauna of Britain in 1869, with as much certainty as one can say what will happen to the vapour of the breath on a cold winter's day." These laws, then, govern what the evolutionists elsewhere call "accidents." Whether Mr. Herbert Spencer's "Energy" would eliminate "accident," strictly speaking, from the universe, or not, I cannot tell. But if so, it explodes the whole of Mr. Darwin's theory based on the "Survival of the fittest,"—at least, as it is used by the evolutionists. The only value of Mr. Spencer's "Energy," however, to many of us, is to cover an infinity of nebulous thought; for the idea conveyed by the word is simply "power for work," wherever found. And it is difficult to see what we can really establish upon the endeavour to unify in speech or theory the power for work of some kind or other that exists all over the universe. But if there be one such "Energy" behind its manifold ramifications, and if it be working out such harmonies and adaptations in Nature as would be worked out in obedience to final causes existing in some intelligent intention, is that "Energy" blindly-intelligent or *quasi*-intelligent? or how am I to understand it? Does it only prompt "accidental variations"? or does it work on definite lines? If the latter, where is the "accident"? And if the "Energy" develope final causes, how are we to eliminate from it the attribute of Mind?

Surely in eliminating the doctrine of final causes from the Universe, the evolutionists destroy the only real guide we can take for unravelling, so far as we can unravel, the functions of Nature. Moreover, they thus deny that which they themselves practically follow throughout their investigations.

"Accident" *versus* "Certainty," as a guide to the explanation of the harmonies and adaptations of the Universe, seems to be the greatest philosophical paradox conceivable.

NOTE ON STRUCTURE AND STRUCTURELESS.

By LIONEL S. BEALE, M.B., F.R.S.

ALTHOUGH jelly, as, for example, the jelly-like matter of which many of the Acalephæ are composed, or the so-called vitreous humour of the eye, appears perfectly transparent when examined by the unaided eye,—as transparent as glass,—both these tissues have a distinct *structure*, which may be revealed by microscopical examination, especially if the delicate tissue be tinted with certain colouring matters. But there is another kind of matter said to be “jelly-like,” which is found throughout the living world, in which no structure whatever can be discerned, though it be submitted to examination by the very highest magnifying powers. And in many cases where, in relation with this matter, fibres or fibre-like structures, or granules, or globules have been discovered, these are in contact with, and in most cases formed from, the transparent and really structureless substance. And where, as in many instances, these bodies exhibit movements, the latter are communicated from the semi-fluid structureless material. In fact, it is this which moves and causes the movement in the fibres or granules. Now, it has been somewhat positively laid down that *structure* will ere long be discovered in this truly structureless living matter. “By higher magnifying powers than any we possess or can have any idea of, *structure* will be revealed.” Those who agree in this contention, and they are many, do not attempt to show how the “structure” of their imagination will help them to explain the facts of life. They seem to be very certain that the mysterious phenomena of life are to be somehow explained by *structure*, although we have been for years discovering structure after structure, and we are just as far from anything like a reasonable explanation of life as ever—nay, we are farther than we were some years ago, because views have been forced upon us of late which are not supported by facts. We are told we *must* accept these views because the facts which are to prove them will certainly be discovered at some future time, and we are in the mean while to believe in the prophetic demonstrations vouchsafed to us by scientific prophets.

But, if we allow ourselves to be guided by actual facts and

observations, and discard all prophetic assurances, we shall come to a very different conclusion. Look where we will in the living world among organisms, high and low, complex and simple, at the earliest period of existence, in the adult and in old age, in forms and types of such antiquity that, could we carry ourselves back for tens of thousands of years, we should find examples of the very same forms growing and multiplying as are now with us, and in creatures which have perhaps only exhibited their present characteristics during recent times. We come face to face with perfectly clear, transparent, colourless, semi-fluid or diffuent matter, so utterly devoid of any character to which the term "structure" can with fairness be applied that every part moves freely, not only from one place to another, or vibrates backwards and forwards, but every part seems to move into and out of every other part. If "structure" can be applied to this matter, the term may be applied to clear mucilage, or to syrup, or to water in the liquid state. We must then carefully distinguish the "structure" we mean when we apply the word to mobile liquids from that we indicate when we speak of the "structure" of a tissue, of a cell, or to the "structure" of a crystal, of a rock, &c. By "*structureless*" I mean not only that no threads, or fibres, or lines, or dots, or parts, or particles can be discerned by the use of the highest powers of the microscope, but that every part of the matter termed "*structureless*" is mobile, and can freely pass amongst other portions, and concerning which *structure* of every kind must be considered absent if the question be regarded from a purely theoretical standpoint only.

No tissue can be formed, no structure can be evolved, no secretion produced, no beat of heart or movement of respiration, no contraction of muscle, no emanation or flow of nerve-current, not even the lashing of a cilium, or the taking up of a particle of food, can be effected without changes in the *absolutely structureless*. How any one in these days, with the facts before him, can be searching for structure which shall enable him to account for actions and functions peculiar to living things is most extraordinary. All that lives, and all that has lived, has begun not in structure, but in the *structureless*; and whenever in a living thing structure is found there some time before would have been discovered *structureless living matter* only.

While no one can be found who will maintain that all function and peculiarity of arrangement, and of chemical composition, of variety of organisation and type in the living world, is due to original structure certainly existing, though not discovered, at the earliest period of existence of the

minute germ, almost every one who writes or speaks on the subject seems to believe that "structure" is the undiscovered secret. On the other hand, to my mind the evidence we already possess is conclusive that all structure is a consequence, and not a cause, of prior changes in the structureless, and that universally in the living world "structure" is preceded by absolute structurelessness.

The source of all function as well as structure and character of all forms and types, is the structureless. It is to the operation of some force, power, or property temporarily (that is, while the matter in question is alive) in or upon the material particles of this matter, that structure is due. "Life" is associated with the structureless only, and is altogether independent, not only of structural peculiarities, but of internal chemical composition. Matter exhibiting structure never possesses the vital property of producing its like, and structural characters and chemical properties can be demonstrated only in the case of matter which has ceased to live,—not in the structureless substance which is actually alive,—that is during the time when it manifests all its wonderful powers of movement, formation, and transmission of power like its own to the non-living. Life must be sought for not in the structure, but in the structureless. It is here only we can study its working. In structure, and action, and function we see the results, the consequences of the working of life-power, but the life-power itself has fled ere structure can be discerned, or the presence of a definite chemical compound proved.

We *know* that the material substance of the structureless is alone under the dominion of life-power, and that the matter of all structure, like the rest of the lifeless matter of the universe, is under the sway of ordinary physical law. I do not see how we can proceed one step in the study of the truly vital until the absolute structurelessness of living matter, and the temporary domination of the physical and chemical by the vital, be admitted; and I venture to maintain that, if we had allowed our judgment to be guided by facts of observation and experiment only, we should long ago have accepted these propositions as established, necessary, and incontrovertible truths.

NOTES ON
USEFUL AND ORNAMENTAL STONES
OF
ANCIENT EGYPT.

BY
SIR J. WILLIAM DAWSON, C.M.G., LL.D., F.R.S.

BEING A PAPER READ BEFORE THE VICTORIA INSTITUTE.

AUTHOR'S COPY

NOTES ON USEFUL AND ORNAMENTAL STONES
OF ANCIENT EGYPT. By SIR WILLIAM DAWSON,
C.M.G., LL.D., F.R.S.

WHEN, in the winter of 1883-4, I had the pleasure of visiting some parts of Egypt and Syria, I had prepared myself, by previous study of books and collections, to devote as much of my time as possible to the investigation of certain critical and uncertain questions in the geology of those regions, and especially of the geological facts bearing on the advent and early history of man. Preliminary notes on these points were published in a short series of papers in the *Geological Magazine* (1884), and a paper on the "Bone Caves of the Lebanon," in the *Transactions* of this Society (vol. xviii), and the results were more fully given in my work *Modern Science in Bible Lands*, published in 1888, although the pressing occupations of the intervening three years did not leave sufficient time to work up all my notes and specimens.*

* Reference may also be made to Professor Hull's Paper, "A sketch of the Geological History of Egypt and the Nile Valley," in vol. xxiv of the Institute's Journal.

Among these are some relating to a subject which impresses itself very strongly on a geological traveller in the Nile Valley, namely, the various rocks and minerals used by the Egyptians from very early times, the purposes to which they were applied, and the manner in which they were quarried and worked. I made large collections to illustrate these points; not, however, I may be excused for saying, by defacing monuments, but by collecting broken fragments lying on old sites, and by visiting quarries and natural exposures. Egypt affords unlimited material of this kind to a lithological collector, without detriment to existing works of art, and much may also be obtained from the people, who quickly understand the value both of rock specimens and fossils when pointed out to them, and who cannot fabricate these in the manner of clay scarabs and other imitations of antiques.

The present notes may be considered supplementary to what is stated in the work above referred to.

1. GRANITIC, DIORITIC, AND GNEISSIC ROCKS.

To these groups belong a large part of the monumental stones of Egypt; and from the First Cataract and the hilly ranges east of the Nile they were transported to every part of the country, even to the shores of the Mediterranean and the neighbourhood of the Isthmus, and this not in small blocks but often in great masses much more weighty than any used in modern architecture or sculpture. For this, no doubt, the navigable water of the Nile and its canals, and the variations of its level in the inundations, afforded great facilities.

The most important of all these rocks is the celebrated red granite of Syene, so generally employed in the greater Egyptian monuments. I have given detailed descriptions of this rock and its varieties in the Appendix to *Modern Science in Bible Lands*, and may merely say here that it is essentially a holo-crystalline rock, often coarse-grained and consisting mainly of orthoclase and plagioclase feldspars, with a little microcline—associated with hornblende and quartz, the latter usually in small quantity. When mica is present, it appears to be biotite, and there are sometimes minute crystals of apatite, sphene, and magnetite.

The study of this rock in place at Assouan convinces me that in regard to its mode of occurrence it is sometimes an intrusive or indigenous granite, and sometimes a true bedded

gneiss. Though the minerals in these two kinds of rock may be the same, they are distinct both in macroscopic and microscopic characters and mode of occurrence, and should not be confounded by geologists. Though the granites may in some cases be locally impressed with a laminated texture, there is no necessity for confounding them with gneisses, which are true bedded rocks; and their practical value, as well as the natural products derivable from the two classes of rocks (as soils and sands, for instance), are quite different. Huge dykes of the intrusive granite occur at Assouan, traversing the gneissic beds, and thick beds of the gneiss, interstratified with micaceous and hornblendic schists. Both species were worked by the ancient Egyptians. The great obelisks and the lining stones of the Temple of Bubastis, or some of them, are examples of the former. The broken colossus of Rameses at the Ramesseum, in Thebes, is a good example of the latter. The stupendous fragments of this statue confirm the description of Diodorus, who commends it not only for its great size, but for the "excellence of the stone." This is, in fact, not a granite, but a mass taken from a thick bed of gneiss of fine colour and uniform texture, and more dense and imperishable than any true granite. It must have sat 60 feet high, and before it was sculptured must have weighed about 900 tons. It was surpassed by but one other statue in Egypt, that gigantic one discovered by Petrie at Tanis, known only in fragments, which seems, without its pedestal, to have been at least 80 feet in height. It also was of the red stone of Syene. Of the two kinds of so-called Syene granite, the gneissic variety is the more compact and durable, and the more resisting to the action of the weather. This is a usual circumstance elsewhere, and probably depends on the fact that the gneisses have been subjected to extreme pressure during their crystallisation. The orthoclase gneisses and granites of Assouan are not distinguishable from those of the Laurentian series of North America. The gneissic variety used in some of the older structures at Gizeh is porphyritic, or an "augen-gneiss," having large crystals of pale-reddish felspar.

The shallower sculptures on many monuments of this stone seemed to have been chiselled in the usual way, but the more deeply-cut hieroglyphics and figures were probably worked in the first instance with the hollow drill.

A very remarkable stone employed in Egyptian sculpture is that variety of gneissoid rock known to Canadian geolo-

gists as anorthite rock or gneissic anorthosite. It occurs in various parts of the Laurentian districts of Canada, and more especially in those portions held by Logan to be Upper Laurentian. In Egypt, this rock first attracted my attention as the material of a magnificent statue of Kephren, the builder of the second pyramid, now in the Gizeh Museum. In this statue the lines of black hornblendic matter which mark the foliation are distinctly visible, especially on the right side. I was informed by M. Emil Brusch Bey that several similar statues in a broken condition had been found, and was enabled, through his kindness, to obtain some chips for examination. These were subsequently studied by Dr. B. J. Harrington, and compared with the analogous rocks of the Laurentian of Canada.*

More recently, some new slices were cut and were examined by Mr. F. D. Adams, whose description is as follows:—

“In the hand specimen, it cannot be distinguished from a variety of anorthosite found at New Glasgow, P.Q., and elsewhere in the Laurentian system of Canada.

“When the slide is examined under the microscope, the rock is seen to be very fresh, and to be composed essentially of felspar with a very small amount of hornblende, which, in one place, is intergrown with a little pyroxene.

“Nearly one-half of the felspar grains show polysynthetic striations, and are, therefore, plagioclase; the remainder, although occurring as untwinned individuals, show in almost every case good cleavages, and a biaxial figure when cut normally to an optic axis, and in appearance differ in no way from the twinned grains. They are probably also plagioclase, since, as Hawes pointed out several years ago, the plagioclase in Canadian anorthosite rocks frequently shows no striations.

“The hornblende is present in very small amount as compared with the felspar, and occurs in irregular-shaped grains. It is pleochroic in green and yellowish tints. No quartz, iron ores, mica, or other minerals are present.

“In the thin section, as in the hand specimen, it bears a strong resemblance to many of our Canadian anorthosite rocks.”

I have placed in the Redpath Museum a specimen of

* *Modern Science in Bible Lands*, pp. 270, 573.

anorthosite from a Canadian locality with the Egyptian specimen to show the resemblance.

I did not see this rock in place, but Newbold seems to have found it in the mountain range eastward of the Nile, and it will no doubt be found to be related to the Laurentian axis of that range. The banded varieties or anorthosite gneisses, to which the material of the statue belongs, used to be regarded as altered sedimentary rocks. They are now more usually classed with igneous products, as either intrusive masses laminated by pressure or bedded igneous rocks consolidated and altered. In all probability, the latter is the more correct view.

It has been usual to call the material of these anorthosite statues diorite. For this there is a justification in the fact that the materials are in great part similar to those of that rock; but the lamination, the crystalline structure, and the proportions of the constituents are different. A singular conjecture has also been started, to the effect that this material was derived, as well as the diorite found on the old Chaldean site of Tel-loh, from quarries in the Sinaitic Peninsula, and it has even been imagined that a primitive school of sculpture existed at Sinai. Such hypotheses are, however, altogether baseless. The Chaldeans could obtain such materials from the mountains on the Persian frontier, and the Egyptians from those of their own eastern territory, and neither could easily have transported large masses of stone from the Sinaitic district.

The stone in question has many good points as a material for sculpture. It is of uniform texture and of moderate hardness, between that of marble and quartz. It is free from the quartz grains that render granite intractable. It is tough and takes a high polish. Its colour is agreeable, like that of a banded white and grey marble, and its lustre is superior to that of marble. It is extremely durable and resisting, and not liable to discoloration by weathering. Such properties, no doubt, commended it to the sculptors of the remote period of King Kephren, and it is perhaps remarkable that a stone with so many good qualities has been neglected by more modern artists. The statue of Kephren now in the Gizeh Museum bears testimony by its excellent preservation to these properties, and probably the other statues which accompanied it would have been equally perfect had they not been wilfully broken. In the later times of Egyptian art this stone seems to have lost its attractions or fallen out of fashion, except for small objects.

It would be extremely interesting to examine the quarries from which it was obtained, and to ascertain, if possible, the date when they began to be worked.

Diorite of many varieties—black, greenish, black with white blotches or mottled with black and white—forms great dykes and eruptive masses in the crystalline district of Upper Egypt, and was always and deservedly esteemed by the Egyptians. I have elsewhere remarked that, as diorite is one of the best materials for the formation of polished stone hatchets, it must have very early attracted attention; and its toughness, lustre, and susceptibility to a good polish must have indicated it as a material for sculpture. Accordingly, it is applied to a great variety of uses, from colossal statues down to platters and trays. A large proportion of the finest Egyptian statues are cut in diorite.

A dark grey granite has also been employed. It differs from the diorite in containing a little free quartz, and in having orthoclase felspar; but hornblende is usually its chief constituent. I have observed this black granite in a doorway at Karnak, in loose pieces on the site of a temple at Gizeh, in a sarcophagus at Thebes, in one of the Apis sarcophagi at Sakkara, in statues of Bast, and in a figure of Nectanebo and a hawk from Pithom in the British Museum.

True diorite occurs in the Rosetta Stone and the Great Scarabæus and several sarcophagi in the British Museum,* in the Pithom Sphinxes now at Ismailia, and in the Hyksos Sphinx and the fish offerers in the Gizeh Museum, and a great number of statues. One of Rameses II in the British Museum is a stone from the junction of red granite and diorite, and thus consists of two distinct kinds of rock.

2. BASALT WITH OLIVINE.

The term basalt has been used in a somewhat loose sense by writers on Egypt, apparently to designate any dark crystalline or subcrystalline rock. Some of the objects designated by this name prove to be dark-coloured hornblendic granites, others are diorites. One rock to which the name very properly applies, occurs plentifully in loose chips on some parts of the pyramid plateau, as if portions of the temples or tombs which have disappeared from that area had been composed of it. A chip from this place has been sliced and has been examined for me by Mr. Frank D. Adams, of McGill University, with the following results:—

* Professor T. Rupert Jones, F.R.S., in *Proc. Geol. Association*, vol. viii.

“From Old Temple, Gizeh.

“This is a medium-grained basalt (plagioclase basalt), in all probability belonging to the subdivision of olivine Basalts.

“It is composed of plagioclase, augite, olivine (?), iron ore, and apatite, with a small amount of glass.

“Under the microscope, the rock is seen to be porphyritic, a few larger individuals of plagioclase and augite occurring scattered through the rock. These porphyritic plagioclase crystals are occasionally somewhat decomposed. The rest of the plagioclase occurs in well-twinned, lath-shaped crystals, and is quite fresh. The augite is often well crystallised, and shows its characteristic cleavage and inclined extinction. There are also a number of more or less rounded grains which seem to have been olivine, but which are now almost entirely altered to a brown decomposition product, showing aggregate polarisation, and which is apparently for the most part hydrated ferric oxide. This material stains the other minerals of the rock, and seems in some cases to result also from the decomposition of the augite or the glass. The iron ore, which is black and opaque, resembles magnetite, and occurs in irregular-shaped grains. The apatite is somewhat abundant, occurring in long, slender needles.”

A rock of this kind is described by Zittel and by Beyrich and Schweinfurth as forming eruptive masses in Lower Egypt, and probably of Tertiary age. One locality is at Abu Zabel less than 20 miles to the north-east of Cairo, and other localities occur in the Lybian Desert to the westward. Schweinfurth has found a rock of similar aspect in hills near the Red Sea, where it appears to have been quarried. The description given by Arzruni of the variety found at Abu Zabel closely corresponds with that of Mr. Adams quoted above.

This kind of rock, probably because of its accessibility and abundance, or perhaps because of the good polish of which it is capable, and the slight play of colours of the felspar and olivine when seen in a bright light, was much used for small objects, especially in Lower Egypt. As examples of this, I have in my collection a palette for grinding colours, a polisher, a perforated disk, two scarabs, some beads, and one of the sacred eyes used as charms. Statues and ornamental work in temples seem also to have been made of it; but it is not well suited to long exposure to the weather, as the olivine and augite are acted on by the atmosphere, and become rusty.

In *Modern Science in Bible Lands*, I have referred to this rock as an olivine-dolerite, and some of the varieties of it seem to contain more olivine than that examined by Mr. Adams. The use of this material suggests the question whether the artists who first employed it may have taken a lesson from the ancient nations who used a similar material so extensively in Northern Syria, or whether, on the other hand, Egyptian masons may have been employed in Bashan. In every country, however, the builder seeking for material comes to similar conclusions, according as he attaches more or less importance to accessibility, durability, or beauty.

3. THE NUBIAN SANDSTONE.

This takes precedence in point of architectural use of all stones in Egypt, except, perhaps, the Eocene limestones. It is not only a soft and easily cut stone, and one which in the climate of Egypt is sufficiently durable; but where the Nile cuts through its outcrop in the gorge of Silsilis, or Silsileh, it presents exposures and facilities for shipment unsurpassed in the world. It was, however, quarried at other places, as in the vicinity of Assouan and in Nubia, where the great temple of Abu Simbel is excavated in this rock. Here, and in the great colossal figures of Amenophis, in the Plain of Thebes, its use in sculpture of the colossal sort is seen, and at Karnak, Kom-ombos, Edfou, and Denderah, its architectural employment on the most gigantic scale. That it is the material of the stupendous hypostyle hall of Seti I at Karnak, should perhaps give it precedence over all other stones of construction. The way in which in interiors it was coated with a gypseous cement and painted, I have elsewhere explained. In one quarry behind Assouan the patient excavator, instead of cutting rectangular blocks, had cut out at one operation large drums for columns, leaving semi-circular niches in the face of the rock. Regarded as a rock, it is a siliceous sandstone, composed of angular grains very loosely cemented, so that it is easily crumbled, and its colour varies from a light cream colour, or nearly white, to a yellowish-brown. Its age probably ranges from Permian to Lower Cretaceous,* and it differs from the newer sandstone of Jebel Ahmar in its less amount of siliceous cement and of red oxide of iron, and in the absence of any rounded grains. Its

* Fossils and stratigraphical arrangement seem to indicate that there may be two Nubian sandstones, one later Palaeozoic, the other Cretaceous but they cannot at present be separated with certainty. I have discussed this question elsewhere.

date is evidently altogether anterior to the operation of that wind-drift which has produced the modern rounded desert sand.

4. LIMESTONE, &c.

In a country where cliffs of this rock present themselves on every side, it is necessarily of great importance, both as a stone of construction and as cement. It is mostly of Eocene age, though some Cretaceous beds have been locally quarried, and it is of very various qualities. It may be coarse and unequal in grain, or filled with fossil shells, as *Nummulites*, &c., or may be fine and uniform in texture. It is sometimes hard as marble, in other cases soft and chalky. It may be grey or brown, or of a pure white. All these varieties were more or less used, the coarser and more unsightly for cores of pyramids, foundations, and other structures not intended to be seen. The stepped pyramid of Sakkara, one of the oldest known, is wholly composed of a brownish limestone, found in the vicinity. The pure white and fine grained varieties were employed for lining and casing buildings, and for ornamental work and sculpture.

The finer varieties present under the microscope various characters. The most common and softest is of the nature of an indurated chalk; a congeries of microscopic foraminiferal shells, and must be an oceanic deposit similar to chalk and *globigerina* ooze. This is the variety employed for casing the Great Pyramid, for lining many temples and tombs, for statues and monumental tablets, and it is the whitest kind quarried at Turra at present. A variety observed at Abydos is of a light grey tint and earthy aspect, but this has been coated with a white cement and coloured. Other varieties used in sculpture have a fine concretionary or oölitic structure, or are so cemented with infiltrated matter as to assume a minutely crystalline character. The fine-grained foraminiferal limestone lends itself to the cutting of hieroglyphic inscriptions of all kinds, and to the art of the colourist, so that it is admirably adapted to the uses to which it was applied in tombs and temples.

A more modern limestone of later Tertiary age exists on the coast near Alexandria, and is quarried for building purposes. It is an organic rock, made up of fragments of shells, and is apparently similar in age and origin to the Pleistocene limestones found near Jaffa and Beyrout, on the Syrian coast, and to the modern shelly sandstones of the coast of the Red Sea, which are used for purposes of construction at Suez.

Alabaster, as distinguished from limestone, is a crystalline, translucent material, deposited in the manner of stalagmite, in veins, or filling caverns in the limestone. It is thus a local and irregular deposit; but the Egyptians managed to obtain it in several places, in quantities not only sufficient for vases and minor ornamental purposes, but in blocks and slabs sufficiently large to form shrines and to line portions of tombs, and even of temples. One locality where it has been extensively quarried is in the cliffs on the west side of the Nile, near Beni Suef.

The Egyptian alabaster is sometimes colourless, but more frequently banded with agate-like lines of grey and light brown, whence the name onyx-marble sometimes given to it.

Gypseous or soft alabaster does not seem to have been much used in Egypt, but small vases and other objects made of it are sometimes found.

Cleavable transparent calc-spar, probably obtained from veins in the limestone, was sometimes used by the Egyptians for minor ornaments and beads, probably as a substitute for rock crystal.

5. MIOCENE QUARTZITE OF JEBEL AHMAR, &C.

My first acquaintance with this stone dates from a time long anterior to my visit to the locality. My late friend, Dr. Douglas, of Quebec, had formed in successive visits to Egypt a large and interesting collection of antiquities, in examining which I noticed a small slab, or funereal stela, inscribed with hieroglyphics, and which specially attracted my attention from the fact that it was executed in quartzite of so great hardness as to defy ordinary sculpture with steel tools. At the time, I knew such rocks only as occurring in the old Cambrian series in Canada, and had not learned that they occurred in Egypt. The choice of a stone so hard seemed strange on the part of a people whom I had scarcely supposed capable of dealing with material so refractory, the use of the diamond drill by the ancient Egyptians being then unknown. I remarked at the time that the sculptor, or his employer, had evidently determined to possess an indestructible monument, "regardless of expense," but it seemed impossible to understand how he could by any expenditure have succeeded in his purpose.

Jebel Ahmar, the Red Mountain, lies a little to the east of the Mokattam Hill, in the vicinity of Cairo, and from its

peculiar rugged and dark-coloured appearance attracts, more or less, the attention of all travellers, who have usually regarded it as of volcanic origin. Geologists, as Russegger, Newbold, Schimper, Fraas, Delesse, Schweinfurth, and Owen, have naturally given attention to it, and have discussed its relation to the fossil wood of the so-called petrified forests in its vicinity.

Stratigraphically it consists of beds of more or less indurated siliceous sandstone resting on the Upper Eocene limestones of the Mokattam hill, but differing entirely from them in appearance and mineral character. The stratigraphy thus proves that these sandstones are newer than the Eocene, and they have usually been regarded as of Miocene age, so that we have here an example of an intensely indurated rock of comparatively modern date. Quite recently Mayer-Eymar has, on the ground of certain fresh-water shells found in connection with these beds, assigned them to the Tongrian, or Lowest Miocene age,* and with this view the evidence of the fossil trees is sufficiently in harmony. Of the older authorities, Russegger and Newbold seem to have very clearly understood the character and relations of these singular deposits. In point of fact, Jebel Ahmar, and some neighbouring eminences of similar character, constitute the undenuded remnants of thick beds of sandstone once spread uniformly over this region on both sides of the Nile, and deposited in shallow water succeeding the deeper water in which the Eocene limestones were laid down. Into this shallow water drifted many trunks of trees, principally of the genus *Nicolia*, and other exogenous trees believed to be allied to certain modern species of interior Africa.† With these are trunks of palms, and of Coniferous trees allied to the yew. The wood was silicified, and the sandstone in places hardened into quartzite by the percolation of siliceous waters. The action of the sea and of atmospheric agencies in later Tertiary times have removed the less consolidated portions, leaving the silicified trees scattered about, while there remained as rugged eminences those portions of the beds which had been hardened into quartzite by siliceous infiltration.

That this is the origin of these hills is evident from the

* *Bulletin Zurich Academy*, 1889.

† R. Brown, *Quart. Journ. Geol. Soc.*, iv. Carruthers, *Geol. Mag.*, vii. Schenk, in Zittel's *Lybischen Wüste*. One of the Conifers in my collection is a *Taxites* of modern aspect.

nearly horizontal position of their layers, from their containing silicified wood so distributed, and with its cracks filled by sandstone, &c., as to show that it was embedded in the natural state, and afterwards silicified, and by the irregular pipes or craters passing through the hardest parts of the beds, and apparently the channels of geysers, or fountains of heated water. The date of these aqueous outflows must have been little later than that of the beds of sand, and while they were still unconsolidated, and their drift wood in a recent state. Direct volcanic action is not known in connection with Jebel Ahmar, but volcanic masses of Tertiary age exist near Abu Zabel, between Cairo and Ismailia, and also in the Nubian Desert, which may be of the same age. These have been described by Beyrich, Schweinfurth, and Arzruni, and by Zittel.* They afford the basalt mentioned in previous pages.

The Miocene or "Tongrien" sandstone of Jebel Ahmar may be estimated at 400 feet in thickness. It consists of siliceous sand partially rounded like the desert sand, but with many angular grains, and with the interstices more or less filled in with hyaline silica, sometimes entirely consolidating the mass. In some of the beds are layers of pebbles of quartz, agate, and jasper, many of which are evidently derived from the siliceous concretions in the underlying Eocene limestones. The colours vary from pure white to light red and dull purple, and the rock is often beautifully striped and mottled. From the enormous mass of chips around the hill, and the deep excavations in its sides, these beds of sandstone would seem to have been quarried from the earliest times, and they still furnish materials for millstones and for macadamising the streets of Cairo.

The harder varieties must have afforded the earliest colonists a desirable material for hoes, diggers, hatchets, and war-clubs, and their successors continued to use it largely for hammers and polishers and pestles, as well as for mortars and millstones. But from the earliest periods of Egyptian sculpture and architecture, the beauty and durability of this rock were recognised, and the perfecting of the art of drilling hard stones in the palmy days of ancient Egypt enabled this refractory material to be employed even for the formation of monolithic shrines and colossal statues.

Of the former, a shrine taken from the temple of Pithom,

* *Proceedings of Royal Academy, Berlin, 1882.*

and now in the square of Ismailia, forms a good illustration. I have already described this relic,* and may here merely remark that it is a rectangular, monolithic chamber, 6 feet long and 4 feet high, with a sphinx, left in hollowing the rock, in the centre. It is formed of the red variety of the stone, with the bedding in a vertical position, and appears to be of the age of Rameses II. A similar shrine is noticed by Petrie, as found in the ruins of Tanis, but I have not seen specimens of the stone of which it is made.

One of the six monolithic statues, each about 20 feet high, sitting in front of the southern propylon of Karnac, is of a hard, light-brown variety of this rock with rows of agate pebbles, and though the upper part of the figure is gone, what remains impresses one very strongly with the audacity and perseverance of the Egyptian artist, who could attempt such a work in a material as hard as agate. Petrie informs us that the remains of the two colossal statues described by Herodotus as standing on pyramidal pedestals in Lake Moeris, show that they were of this stone. That such statues should have been broken up seems strange; but it is accounted for by the demand for millstones and pestles, &c., of this material, so that a statue of quartzite was more likely to be destroyed than one of limestone.

Among smaller works of this material the most perfect I have seen are two square slabs or tables of offerings, about 4 feet wide, with bowls elaborately worked on their upper sides, and hieroglyphic inscriptions round their margins. They are in the Gizeh Museum. They are wonderful trophies of skill and patient work, apparently belonging to a very ancient period.

Some travellers have stated that the two great Colossi of the plain of Thebes are of this stone, but this is an error. They are of a much softer rock, the Nubian Sandstone. The quarrying of this material may have been done by wedging out blocks, taking advantage in this of the joints and bedding of the stone. It could then be roughly shaped by chipping and hammering, but the finishing, especially in shrines and statues and in cutting inscriptions, must have been effected with the hollow drill, armed, perhaps, with diamond, as in the modern diamond-drill. Finally, the surface was probably polished by rubbing with sand of emery or other hard stones. Petrie has shown that the use of the hollow metallic drill, armed with gems, was well known in

* *Modern Science in Bible Lands*, p. 279.

Egypt, and Pliny (xxxvi. 1 and 14) mentions its use in classical times, while, in sculptures in the Roman catacombs, we see the sculptor's journeyman hard at work drilling the sides of Roman sarcophagi of stone.

Small objects, as pestles, polishers, and drill-sockets, were made of this stone. I have one of the latter with the depression for receiving the drill finely polished by long use.

6. VARIOUS STONES AND GEMS.

The following occur in the collections which I made in Egypt, and in specimens presented to the Peter Redpath Museum by the Egypt Exploration Fund.

Talcose schist and *talc rock*, images of Osiris, moulds for casting small objects.

Serpentine, scarabs, images of Osiris or ushebti, small vase.

Chlorite schist, a small figure of Osiris.

Argillite or *clay slate*, small figures or charms of various kinds, spear or knife.

Red carnelian, beads and seals.

Agate, peculiar variety of moss agate with circular ferruginous markings, also various agates and jaspers, some rudely shaped, others finely worked as beads, &c.

White milky quartz, fragment of circular object.

Green jasper, cubical bead, with angles truncated.

Amethyst, beads and ornaments.

Flint, knives, scrapers, piercers, arrow-heads. All are of the kinds of flint common in the Eocene limestones.

Garnet, beads in carbuncle and rosy varieties.

Lapis lazuli, scarab, Otus eye, bead, &c.

Steatite, small figures of animals, &c.

Hematite, black and finely-polished Otus eye.

Labradorite, oval button or knob, broken at base.

Fluor spar, purple beads.

Porphyry, red and other colours in various small objects.

Fuchsite, or chromiferous green variety of mica schist, a rude fragment, possibly used for inlaying. This rock is found in the Tyrol, and in Maine, in the U.S. of America. No Egyptian locality is known. The specimen came from Naukratis.

Mica schist, perhaps a whetstone, also fragments unworked.

Turquoise, a ring stone.

Emerald or *beryl*, in beads.

The precise dates of these objects are of course unknown, but they were obtained mostly by Arabs from old Egyptian

graves, and some of them may be of great antiquity, while others are probably comparatively modern.

7. FLINT FLAKES, KNIVES, SAWS, &c.

It may be well to add here a few words as to the use of flint among the ancient Egyptians. There has been much unprofitable discussion as to whether the numerous flakes which may be picked up on the surface, especially near ancient sites, are natural or artificial, and if the latter, whether they are "prehistoric," or belong to the historical era. A few general statements of fact may serve to dispose of these questions.

(1.) The Eocene limestones of Egypt are rich in flint concretions. Some beds are especially stored with these; and even in the fine-grained white limestones used for the more important architectural purposes, the artist was often troubled by kernels of siliceous matter. Where the limestones have been denuded, great numbers of these concretions remain on the surface, just as in the chalk districts of England, and the gravel beds belonging to the older deposits of the Nile Valley, as near Thebes, at Helouan, &c., are largely composed of flints. Hence at all periods flint has presented itself to the Egyptian as an available material for tools and other purposes, and at many localities, as at Helouan, at Jebel Assart, Thebes, and in the desert, east of the Nile, ateliers with cores as well as flakes, and arrow-heads, saws, &c., may be found.

(2.) Besides the flints worked by man, innumerable chips exist that have been produced by nature. Some flints split or scale off under changes of temperature, and small rounded flakes produced in this way, and flints with conchoidal depressions are not uncommon. Torrential action, in all countries of flint gravel, has struck off numerous irregular flakes, and split the more friable flints into pieces, so that in some of the gravels a large proportion of the flints have been broken. On the one hand, there is little doubt that such naturally broken flints have been used as implements. On the other hand, any one who supposes all flint chips to be of human workmanship, even when they show a "bulb of percussion," is unduly credulous.

(3.) As to date, there is abundant proof that in historic times flints were used for surgical purposes, for incisions in corpses, for circumcision, for sacrificial purposes, and probably for common arrow-points. Careful study of the finer hieroglyphics of the calcareous tombs has also convinced me

that these were scraped in the soft limestone with pointed flints, such as are often found abundantly in the vicinity of such tombs.

(4.) It is, however, probable that in very ancient times when metals were scarce and dear, flint implements were in much more common use than in later times. Perhaps the most interesting case of this is the comparison made by Petrie (*Nature*, Dec. 5th, 1889) of two towns, Kahun and Gurob, 50 miles south of Cairo, and on the two sides of the entrance to the Fayum. The former town belongs to the early time of the 12th Dynasty, the latter to the 19th. In the former flint flakes are abundant, of various forms, and evidently applied to many uses. Among other tools a wooden sickle was found, armed with saw-edged flint flakes on the cutting side, thus connecting flint flakes with the reaping of grain. Petrie figures an example of this. In the other and later site flint flakes scarcely occur, and are rude and evidently applied to fewer uses. This seems to be an excellent illustration of the progress in one locality from a stone to a metal age. The interval of time amounts, however, to at least a thousand years, and the earlier period, that of Usurtasen II, was a time of high civilisation and great progress in the arts of life, though farmers in the central district of Egypt were still reaping their fields with flint flakes. A parallel to this is found in the prevalent use of stone for hoes, &c., among the more civilised American nations, to which I directed attention in a paper on "Fossil Agricultural Implements," in the *Transactions* of this Society several years ago.

This continuous use of flint flakes among a civilised people, and the fact remarked by Petrie, and which has been observed also in Scotland and America, that the flint implements become ruder and more coarse as they are supplanted by metal, should furnish a caution against sweeping generalisations as to ages of stone and metal, and of progress in the manufacture of flint tools and weapons. While at some times and in some localities there has been an advance from rude to finer implements, in other instances the process has been reversed.

In connection with the materials referred to in this paper, certain geological and historical facts impress themselves very strongly on our minds.

All the rocks of the Nile Valley, from the ancient crystalline and probably Laurentian granites and gneisses to the modern

limestones on the coast, have furnished materials for construction and sculpture in Egypt, and this from a very early period. This is an indication of the mental activity, observation, and intelligent industry of the people and their rulers, and, with their other achievements in irrigation and in utilising animals and plants, shows the enterprise of an early and active-minded state of society, as distinguished from the fixity and conservatism which appear in later times.

In connection with this, it is, however, to be observed that no country in the world presents greater facilities for the discovery and exploration of its mineral treasures. The proximity of the different kinds of stone to the river in cliffs easily accessible, and the unrivalled facilities for transport are important factors in this matter. Still, in the hands of an unintelligent and unprogressive people, these facilities might have long remained undeveloped.

It is also to be observed that from the earliest colonisation of Egypt there seems to have been a settled and orderly state of society, an exemption from foreign aggression, and an abundance of food, all tending to a large population, and giving facilities for the execution of public works: while the necessity of combination of effort in the irrigation and embankment of the land gave the habit of united action under leaders.

The great works of Egyptian construction thus indicate to us a country rich in materials and having admirable means of conveyance and an abundant population, and a surplus of food products. On the other hand, they show that there was an educated class capable of forming and executing great plans with precision and taste, and this again, aided by a multitude of skilled artisans, and by ample command of unskilled labour, especially at certain seasons of the year.

Historically, it is worthy of note that the great works of the Egyptians in stone, if we except the Pyramids, culminated in that period in which there is reason to believe the Hebrews had their residence in Egypt—the time of the great 18th and 19th Dynasties. Within this time fall the Temple of Karnac and the greater buildings of Thebes, as well as the greatest works in statuary. We cannot, however, regard these works as other than purely Egyptian, for this was their plan and style; but the fact that the Pharaohs of this period had at their disposal the peoples and the wealth of Western Asia must have been no unimportant determining cause of their enormous expenditures of material and labour. It was a time when the artistic skill and ambition of the Egyptians

had at command an abundance of men and means, and these they employed in quarrying and working stone for temples and statues on a scale which has not since been equalled in any part of the world. In more modern times there may be equally great triumphs of design and mechanical execution, but they run in different directions, and aim at different results from those of the ancient people of Khemi, who, with all their ordinary wants superabundantly supplied by the fertility of their soil and their own eminent agricultural skill, could afford to spend a vast amount of energy in great works of art, commemorative of their lives and national achievements or tributary to their religion.

THE ABORIGINES
OF AUSTRALIA:
THEIR ETHNIC POSITION
AND RELATIONS.

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THE ABORIGINES OF AUSTRALIA: THEIR ETHNIC POSITION AND RELATIONS. By JOHN FRASER, B.A., LL.D., F.R.S. of New South Wales.

THE aborigines of Australia present a wide and interesting field for ethnographical study. The field is as yet to a large extent unexamined and unexplored; for, although there are some books specially written about our aborigines, their customs and language, and although many of our older colonists can tell much about their habits, yet the subject has scarcely attained to the dignity of a scientific study. I purpose to-night to confine myself to a single department of this subject,—the position and relation which our aborigines hold to the rest of mankind; and to take my arguments only from what I may be permitted to call the common religiousness of nations. And as I am a colonist on a visit to this country, and have not here opportunities and facilities for a complete treatment of my theme, I shall ask your permission to refer to and quote a portion of my past labours in this field, as published in vol. xvi. of the Journal of the Transactions of the Royal Society of New South Wales.

I have said that I mean to build my argument on the religious ideas and ceremonies which exist among our Australian aborigines, and the resemblance of these to similar institutions found among nations and tribes elsewhere. Now, of all the definitions which have been thought of as distinguishing man from the rest of creation, the one that describes him as the "religious animal" is perhaps the best. Some will say that man is the mechanical, the social, the omnivorous, and so on. The philologist will tell us that etymology declares him to be the "thinker." I grant that the power of consecutive thought is a noble gift to man, but I am ready to deny that it is his noblest possession. The religious instinct, however debasing the forms which it now assumes, seems to me a diviner gift; for, while it stimulates, it also chastens and regulates the force and direction of thought, and lays hold of and moulds man's inner nature in a way which mere intellect can never approach. I am further prepared to deny that religiousness is a thing of man's own invention, that mere thinking will ever lead a man to acts of worship, or that the progress and development of thought alone will bring him to more enlightened forms of worship. The tendency, as registered by history and observation, is all in the other direction,—towards degradation, not towards elevation; and if man were solely mental and emotional, his attitude in viewing the vastness, the energy and the multitude of the objects of nature around and above him would be one of awe and fear, not of worship. I therefore believe the manifestations of the religious sentiment among uncivilised nations such as the Australian aborigines, to be like ruins of an edifice, which neither they nor their ancestors ever built, but yet its very stones may tell something of its origin. Now, since man does not invent religious beliefs and practices for himself, we may justly argue that the presence of the same or similar ceremonies in nations at present widely separated in place indicates a common origin. The traditions of a great deluge, so similar everywhere, the folk-lore stories among so many nations, all tell the same tale,—a common origin. And, further, it is not an unreasonable thing to say that, as the human race was long ago split up into four great divisions, which we now call the Aryan, the Shemite, the Turanian, and the Hamite or Ethiopian, and which became antagonistic and locally distinct, so the primitive religion, with its beliefs and practices, would tend in four diverging directions, each portion, however, being homogeneous in itself, although retaining some features of resemblance to its brethren. Now, in speaking to you about our aborigines, I

have to do with the Ethiopian or black race, and if I can show you that the Australian beliefs are closely like those of the black race in other parts of the world, and yet in some respects similar to those of all mankind, I think I can then, without presumption, ask you to agree with me in saying that Lenormant and others must be wrong when they cut off the Australians from the record in the tenth chapter of Genesis, and thus from all connection with the sons of Noah.

My present task, therefore, is to show that the black tribes of Australia are connected with the rest of mankind, and especially with the black race in Africa. But, before I attempt to do so, you may consider it my duty to establish an antecedent probability, or, at least, possibility, that the blacks of Africa and the blacks of Australia are akin; this will carry me back to some of the earliest periods of human history.

The Chaldæan tablets recently deciphered speak of a dark race as existing in the plains of Babylonia from the earliest times, and along with it a light-coloured race.* This dark race I take to be the Kushites; they seem to have been the first occupiers of these regions, and had become so powerful that their empire reached from the Mediterranean to the Ganges, and from the Indian Ocean northwards to the plateau of Ararat. Other races, however, came down upon them from Central Asia, and, like a wedge, split them in two. Hence the position of this race is, in Genesis x., indicated ethnically by the names of Cush, and Mizraim, and Phut, and Canaan, which, geographically, are the countries we call Ethiopia, and Egypt, and Nubia, and Palestine. Their dominion had thus been thrown much to the west of their original seats, and had lodged itself in Africa, now their stronghold; but the other half of their old empire existed still, although much broken, for the later Greek tradition, in the *Odyssey* i., 23, 24, speaks of an eastern as well as a western nation of Ethiopians. Leaving the western Kushites to increase and multiply, and spread themselves into Central Africa, let us follow the fortunes of their eastern brethren. They are the pure Hamites of the dispersion, and long occupied the northern shores of the Persian Gulf and the plains of India. Meanwhile, a composite empire, called on the inscriptions the *Kiprat Arbat*, "the four quarters," had formed itself in Lower Babylonia. This Chaldæan monarchy—the first of the five great monarchies of ancient history—was overthrown by

* Even Cyrus, the conqueror of Babylon, found them there, for, on a cylinder, he speaks of "the black-headed race" as conquered and governed by him.

an irruption of Arab (Shemite) tribes about 1500 B.C. And now, as I think, a second wave of population began to move towards the shores of Australia, for these Arabs were pure monotheists, and in their religious zeal must have dashed to pieces the polytheistic and sensual fabric which the Babylonian conquests had upreared. Those portions of the Chaldæo-Babylonian people that were unable to escape from the dominion of the Arabs, were absorbed in the new empire. But the rupture of the Babylonian state and the proscription of its worship must have been so complete as to drive forth from their native seats many thousands of the people of the "four quarters or zones" and force them westwards into Africa or eastwards through the mountain passes into the table land of the Punjâb and thence into the Gangetic plains. Here, I imagine, were already located the earlier and purer Hamites, but finding them to be guilty of a skin not exactly coloured like their own, and not understanding their language, these later Kushites of mixed extraction regarded them as enemies and drove them forth into the mountains of the Deccan, where to this hour the Dravidians, and Kolarians, whom I consider their representatives, are black-skinned and savage races. Ere long these Babylonian Kushites were themselves displaced and ejected from the Ganges valley by a fair-skinned race, the Aryans, another and the last ethnic stream of invaders from the north-west. These Aryans, in religion and habits irreconcilably opposed to the earlier races of India, waged on them a relentless war. Hemmed up in the triangle of Southern India, the Hamites could escape only by sea; the later Kushites, on the other hand, could not seek safety in the mountains of the Deccan, as these were already occupied; they must, therefore, have been pushed down the Ganges into Further India and the Malayan peninsula; thence to pass at a later time into Borneo and the Sunda Islands and Papua, and afterwards across the sea of Timor into Australia, or eastwards into Melanesia, driven onwards now by the Turanian tribes which had come down from Central Asia into China and the peninsula and the islands of the East Indies.

Many known facts favour the view which I have thus taken of the successive waves of population which flowed over Indian soil towards Australia. I will mention two or three of these: (1) Ethnologists recognise two pre-Aryan races in India. The earlier had not attained to the use of metals, and had only polished flint axes and implements of stone; the later had no written records, and made grave-mounds over their dead. The Vedas call them "noseless," "gross feeders on

flesh," "raw eaters," "not sacrificing," "without gods," "without rites." All this suits our aborigines; for they use stone axes; in several districts they make grave-mounds; the typical natives are "noseless," for they have very flat and depressed noses as contrasted with the straight and prominent noses of the Vedic Aryans; they have no gods and no religious rites such as the Vedas demand. (2) The Kolarian and Dravidian languages have inclusive and exclusive forms for the plural of the first person. So also have many of the languages of Melanesia and Polynesia. (3) The aborigines in the south and west of Australia use the same words for I, thou, we, you, as the natives of the Madras coasts of India.

Having thus shown from history and from the migration of nations that the aborigines of Australia, as to their remote descent, *may* be the brothers of the negroes in Africa, I now proceed to my proper theme, a comparison of the religious ceremonies and beliefs on both continents. We cannot expect to find set modes of worship or a formulated creed such as the possession of sacred books might secure, but we shall rather seek for analogies in the experiences and practices of their social and tribal life, for it is there that ancestral beliefs often stamp themselves permanently; a custom is there maintained from age to age, while those who practise it know not what it means or whence it came.

At present I confine myself to one tribal custom; our black fellows have a ceremony called the Bora, through which the young men pass when admitted into the tribe. This Bora exists everywhere throughout Australia, and is carried out everywhere much in the same fashion. I therefore conclude that it belongs to the whole race, and is an essential attribute of its existence. Now, if I may trust the accuracy of Hurd's *Rites and Ceremonies*, the negroes of Upper Guinea had, seventy years ago—long before ethnography became a science—certain religious mysteries singularly like those of the Bora, and I suppose they have them still.* These, like the Bora, are ceremonies of

* From W. Winwood Reade's book on *Savage Africa* (London: Smith, Elder, & Co.) I learn that similar ceremonies still exist in Equatorial Africa. He says: "Before they are permitted to wear clothes, marry, and rank in society as men and women, the young have to be initiated into certain mysteries. I received some information on this head from Moongilomba, after he had made me promise that I would not put it in my book. He told me that he was taken into a Fetich-house, stripped, severely flogged, and plastered with goat-dung, this ceremony, like those of Masonry, being conducted to the sound of music. Afterwards there came from behind a kind of screen or shrine uncouth and terrible sounds, such as he had never heard before. These, he was told, emanated from a spirit called Ukuk. He afterwards brought to me the instrument with which the fetich-man makes this

initiation, and not only bring a youth to a knowledge of his country's gods, but qualify him to commune with spirits and to hold civil power and authority in the state; all the uninitiated are to him a "*profanum vulgus*," who, on the least transgression of orders, are hurried away into the woods, there to be destroyed by the evil spirits which the magical power of the initiated can command and control. As an assembly of this kind is convened but four or five times in a century, and occupies a period of five years, only a small portion of the male population can acquire the qualification necessary for power in the state. The king issues, when he pleases, an order for the holding of this assembly. The preparations are committed to the care of those old men that are known to be best acquainted with the mysteries. These choose suitable places in the woods, and make ready there every appliance which can produce surprise, awe, and chilling fear on the minds of the novices. All women, children, and strangers are warned from the spot during the ceremonies, and the novice believes that, if he reveals any of the secrets of the grove, the spirits, knowing his faithlessness and profanity, will in some way or other bring destruction upon him. The country for some three or four miles around is sacred and inviolable, and the evil spirits will carry off those who intrude.

The essential idea prominent in the negro ceremony of initiation is that of death and a new birth, a regeneration. Hence the catechumen before he proceeds to the groves gives away all his property and effects, as if about to die to the

noise. It is a whistle made of hollowed mangrove-wood, about two inches in length, and covered at one end with a scrap of bat's wing. For a period of five days after initiation the novice wears an apron of dried palm-leaves, which I have frequently seen. The initiation of the girls is performed by elderly females, who call themselves Ngembi. They go into the forest, clear a space, sweep the ground carefully, come back to the town, and build a sacred hut, which no male may enter. They return to the clearing in the forest, taking with them the Igonji, or novice. It is necessary that she should have never been to that place before, and that she fast during the whole of the ceremony, which lasts three days. All this time a fire is kept burning in the wood. From morning to night, and from night to morning, a Ngembi sits beside it and feeds it, singing, with a cracked voice, 'The fire will never die out.' The third night is passed in the sacred hut; the Igonji is rubbed with black, red, and white paints, and, as the men beat drums outside, she cries, 'Okanda, yo, yo, yo,' which reminds one of the Evoxhe of the ancient Bacchantes. The ceremonies performed in the hut and in the wood are kept secret from the men, and I can say but little about them. . . . During the novitiate which succeeds initiation the girls are taught religious dances; the men are instructed in the science of fetich. It is then that they are told that there are certain kinds of food which are forbidden to their clan. One clan may not eat crocodile, nor another hippopotamus, nor a third buffalo."

world, and on the completion of his novitiate, when he returns to his kindred, he pretends to forget all his past life and to know neither father nor mother, nor relations nor former friends,—his is a new life; his whole aspect is that of a new man, for he now carries on his head a cap made of the bark of a tree, he is adorned with feathers, and as a badge of his new rank he wears a collar of leopards' teeth round his neck. During the five years of his training the probationer is attended by some old and experienced devotees who act as his instructors; they teach him the ritual of their religion, various songs and pieces of poetry, mostly in praise of their chief god, and, in particular, he learns from them a dance of a frenzied kind. While this course of education is proceeding, the king frequently visits the groves and examines the candidates. When their training is sufficiently advanced, they receive each a new name, and, as a token of their regeneration, several long wounds, which afterwards become permanent scars, are made on their neck and shoulders. They are now conducted to some retired place at a distance where women may attend them. Here, their religious education being already complete, they are instructed in those principles of morals and politics which will make them useful as members of the state, and fit to act as judges in civil and criminal causes. This done, they leave the groves and their tutors, and, with their new badges of perfection upon them, they exhibit their magical powers in public by means of a stick driven into the ground, with a bundle of reeds at its top, or they repair to the public assembly, and join in the solemn dances of the wise men or in the duties of civic rulers.

The aboriginal races of India also have observances similar to those of the African negroes; for I learn from a lecture delivered last year in this hall that, among some of the Dravidian tribes of Central India, "persons desiring to enter the priesthood are required to retire for some days to the jungle and commune in solitude with the deity. Before they are confirmed in their office, they are expected to perform some marvellous act as evidence of their having acquired superhuman power." In another tribe, the novice "retires 'to the jungle, and there remains alone and without clothing for eight days, during which time he performs certain purificatory rites. On the eighth day he returns and enters upon the discharge of his duties.'"

So far the negroes of Upper Guinea. I now turn to Australia; and there, when a boy approaches the age of puberty, a feeling of restless anticipation spreads over his

mind, for he knows that his opening manhood has brought him to the threshold of ceremonies of mysterious import, through which he is to be formally received into the tribe and thereby to acquire the dignity of a man. The rites of initiation are important, numerous, and prolonged; and, as his admission does not concern himself or his family merely, but the whole tribe, these observances call together large assemblages, and are the occasion of general rejoicing.

This assembly,—the most solemn and unique in the tribal life,—is called the Bora. The whole proceedings are essentially the same everywhere in their general features and teachings, but the details vary among the different tribes. Therefore, instead of a separate narrative for each tribe, I will endeavour to present to you a full view of the Bora, taking one tribal mode as the basis of my description, but introducing from the other tribes such features as appear to me needed to complete the significance of the ceremonies.

The chiefs of the tribes know that some boys are ready for initiation; they accordingly summon their "marbull," or public messenger, and bid him inform the sections of the tribe that a Bora will be held at a certain time and place, the time being near full moon, and the place being usually a well-known Bora ground; they also send him away to invite the neighbouring tribes to attend; this invitation is readily accepted, for, although the tribes may be at variance with each other, universal brotherhood prevails among the blacks at such a time as this. The day appointed for the gathering is, perhaps, a week or two distant, and the intervening time is filled with busy preparations by the leading men of the novice's tribe. They select a suitable piece of ground, near water, if possible, and level for convenience in sitting or lying on; they then form and clear of all timber, and in most cases even of every blade of grass, two circular enclosures, a larger and a smaller, about a quarter of a mile from each other, with a straight track connecting them*; the trees that grow around the smaller circle they carve at about the height of a man, often much higher, with curious emblematical devices and figures; the circuit of each ring is defined by a slight mound of earth laid around, and in the centre of the larger one they fix a short pole with a bunch of emu feathers on the top of it. Everything is now ready for the rites of initiation, and there is a large concourse; the men stand by with their bodies painted in stripes of colour, chiefly red and white; the women,

* In the Bora grounds which I have examined this path leads due east and west by the compass.

who are permitted to be present at the opening ceremony only, are lying on the ground all round the larger ring with their faces covered. The boy, painted red all over (I speak of only one, but there are several boys initiated at once), is brought forward and made to lie down in the middle of it, and covered with an opossum rug. Such of the old men as have been appointed masters of the ceremonies now begin to throw him into a state of fear and awe by sounding an instrument called *tirricoty*, similar to what an English boy calls a "bull roarer." This same "bull roarer" is found in Central Africa, and is there also used as a sacred instrument. In Australia the men use it on all occasions when they wish to frighten the women and boys, who cower with fear whenever they hear it. It is made of a piece of thin wood or bark; it is about nine inches long, and is sometimes shaped and marked like a fish. The roaring sound is supposed to be the voice of a dreaded evil spirit who prowls about the black fellows' camp, especially at night, and carries off, tears and devours those he can seize. When the performers think that the "boombat" (so they call the novice) has been sufficiently impressed, *tirricoty* ceases to speak; they then raise the boy from the ground and set him in the ring, so that his face is turned towards the cleared track which leads to the circle of imagery; then an old man comes forward, breathes strongly in his face, and makes him cast his eyes upon the ground, for in this humble attitude he must continue for some days.

Two other old men next take the boy by the arms and lead him along the track, and set him in the middle of the other enclosure. As soon as this is done, the women rise from their prostrate position and begin to dance and sing. The Murring tribe, on our S.E. coast, place along this track or path figures moulded in earth of various animals (the *totems*), and one of Daramulum, a spirit god whom they fear. Before each of these figures the devotees have a dance, and a "Koradjie" (that is, doctor or medicine man) brings up out of his inside by his mouth, the "jo-e-a" or magic of the *totem* before which he stands; for the porcupine he shows stuff like chalk, for the kangaroo stuff like glass, and so on. Meanwhile the boy has been sitting in the smaller circle with downcast eyes; he is told to rise, and is led in succession to each of the carved trees around it, and is made to look up for a moment at the carvings on them, and while he does so the old men raise a shout.* When he has come to know all the

* A fire is kept constantly burning in the centre of this ring; with this compare the Vestal fire at Rome. The boy is made to lie within the ring prone

carvings sufficiently, the men give him a new name, which *must not* be revealed to the uninitiated, and they hand to him a little bag containing one or more small stones of crystal quartz; this bag he will always carry about his person, and the stones must not be shown to the uninitiated on pain of death. This concludes the first part of the performance.

The "boombat" is next conveyed, blindfolded, to a large camp at a distance of several miles, no woman being near, and food is given to him, which he eats still with his eyes cast down; here they keep him for eight or ten days, and teach him their tribal lore by showing him their dances and their songs; these he learns, especially one song of which I can tell nothing further than that it is important for the boy to know it. These songs, they say, were given them by Baiamai, the great Creator. At night, during this period, the "boombat" is set by himself in secluded and darksome places, and all around the men make hideous noises, at which he must not betray the least sign of fear. At some part of the ceremony a sacred wand is shown him; of this Ridley says:—"This old man, Billy, told me, as a great favour, what other blacks had withheld as a mystery too sacred to be disclosed to a white man, that "dhurumbulum," a stick or wand, is exhibited at the Bora, and that the sight of it inspires the initiated with manhood. This sacred wand was the gift of Baiamai. The ground on which the Bora is celebrated is Baiamai's ground. Billy believes the Bora will be kept up always all over the country; such was the command of Baiamai."

Another conspicuous part of the inner Bora customs is the knocking out of one of the upper front teeth of the "boombat." The tooth is then conveyed from one sub-tribe to another until it has made the circuit of the whole tribe; on its return it is given to the owner or kept by the head man. It is said that an ancient shield (*cf.* the sacred Ancilia of Rome,) handed down from past ages, and regarded as almost equal to Daramulum himself, accompanied the tooth. This tooth-breaking, however, is not practised by some of the larger tribes; but instead of it there is circumcision, cutting of the hair, &c.

on the ground for weeks, it may be, getting only a very little food and water now and then. When he wishes to go outside, the old men *carry* him over the circle-mound. With this compare the sacredness of the *pomerium* circuit of ancient Rome. One black boy told me that when he was initiated, he joined the Bora in the month of August, and did not get away till about Christmas. When the blacks in charge of the sacred circle at last bade him rise from his recumbent position, he said he was so weak that he staggered and fell.

All these formalities being now completed, the boombat's probation is at an end. They now proceed, all of them together, to some large water-hole, and jumping in, men and boys, they wash off the colouring matter from their bodies, amid much glee, and noise, and merriment, and, when they have come out of the water, they paint themselves white.

Meanwhile, the women, who have been called to resume their attendance, have kindled a large fire not far off, and are lying around it, with their faces covered as at the first; the two old men, who were the original initiators, bring the boy at a run towards the fire, followed by all the others, with voices indeed silent, but making a noise by beating their *boomerangs* together; the men join hands and form a ring round the fire, and one old man runs round the inside of the ring beating a *heelaman* or shield. A woman, usually the boy's own mother, then steps within the ring, and, catching him under the arms, lifts him from the ground once, sets him down, and then retires; everybody, the boy included, now jumps upon the decaying red embers, until the fire is extinguished.

Thus ends the Bora; the youth is now a man, for his initiation and his instruction are over. But, although these are formalities observed in admitting a youth into the tribe, yet in the Bora, as in freemasonry, the novice does not become a full member all at once, but must pass through several grades, and these are obtained by attending a certain number of Boras; here also, as in Africa, restrictions as to food are imposed, which are relaxed from time to time, until at last the youth is permitted to eat anything he may find; thus the process of qualifying for full membership may extend over two or three years. Then he becomes an acknowledged member of the tribe, undertakes all the duties of membership, and has a right to all its privileges.

I have thus finished my description of the Bora ceremonies, and, as a sort of introduction to that description, I gave at the outset a condensed account of similar observances both in Africa and in India.

Now, when I cast my eye over the Bora and its regulated forms, I feel myself constrained to ask, "What does all this mean?" I, for one, cannot believe that the Bora, with all its solemnities (for the rites were sacred, and the initiated were bound not to divulge what they had seen and done), is a meaningless, self-developed thing; still less that the same thing can have developed spontaneously in Australia and in farthest Africa; I prefer to see in it a symbolism covering ancestral beliefs—a symbolism intelligible enough to the

Kushite race at first, but now little understood, but yet superstitiously observed, by their Australian descendants.

Accordingly I now proceed to what I regard as the most important part of this inquiry, for I shall attempt to show that in many respects the Bora corresponds with the religious beliefs and practices of the ancient world. If we can prove that the germ ideas which underlie the Australian Bora as it has always been celebrated among the aborigines are the same as those in many religions of antiquity, and that these same ideas present themselves in ceremonies of similar import among nations now widely separated in place, I think we have established a strong presumption that there is a common source from which all these things have sprung, and that there is a community of origin on which this community of belief is founded.

And here I wish to enlist the sympathy and assistance of this intelligent audience. There are among you many who have a full and accurate knowledge of the religious systems of Africa and India, and who can therefore give valuable aid in tracing analogies sufficient to build up my argument to the dimensions of substantial proof. I ask these gentlemen to assist me, either now by oral remarks, or afterwards in any form which they may prefer. My present theme is a small contribution to an argument for the unity of the human race as to its origin, and while I work in the Australian field, which is as yet little known, I shall gratefully receive any help which may come from fields that have been long explored.

I now offer to you such analogies as my limited knowledge permits me to refer to :—

(A.) In the Bora there are two circles, the one is less sacred, for the women may be present there, although only on the outskirts; in it certain preparatory things are done in order to bring the “boombat’s” mind into a fit state of reverential awe for the reception of the teaching in the other circle,—the *adytum*, the *penetralia*,—where the images of the gods are to be seen; the women and the uninitiated must not approach this inner circle, for it is thrice holy; “*Procul este, profani.*”

(a.) In the earliest religions, the circle is the invariable symbol of the sun—the bright and pure one, from whose presence darkness and every evil thing must flee away. Thus we have the disc as the symbol of the sun-god in Egypt, Chaldæa, Assyria, Persia, India, China. This fact is so well known that it is needless to multiply examples. Those who are within the circle are safe from the powers of evil. The

sacredness of the circle in those early ages is seen from the Chaldæan name (Genesis xxxi. 47), "the circle of witness"—a name given to a solemn compact of friendship witnessed by that celestial orb which looks down on and observes all the deeds of men. In Persia, to this day, in the southern parts of it, which were originally inhabited by a Hamite race of an almost purely negroid type, there are to be seen on the roadsides large circles of stones which the tradition of the country regards as set there by the Caous, a race of giants, that is, of aboriginals. Their name closely resembles the name Kush, as does also Cutch at the north of the Indus, and other geographical names along the Arabian seas. Then in the classic nations, both in Greece and Italy, some of the most famous temples were circular in form, especially the Pantheon at Athens; and, at Rome, the temple of Vesta, the goddess of the sun-given, eternal fire. At Rome also, for 100 years from the foundation of the city, the worship of the gods was celebrated in the open air (*cf.* the Bora), often in sacred groves; and there also the temple of Janus, the oldest and most venerated of the Roman gods, was merely a sacred enclosure upon which no building stood till the time of the First Punic War. The *pomærium*, or circuit of the walls of Rome, was a sacred ring, and the Circus was consecrated to the sun, and was open to the sky. In Britain, too, the fire worship of the Druids led them to construct ring temples in various places, and especially at Stonehenge, where there are two rings as in the Bora, but concentric. Even the rude Laplanders, who are sprung from the same Turanian race which was one of the earliest elements in the population of Babylonia, make two circles when they sacrifice to the sun, and surround them with willows; they also draw a white thread through the ear of the animal to be sacrificed, and white, as we shall presently see, is the sun's livery.

(B.) In the Bora, the two rings, both of them sacred, communicate with each other by means of a narrow passage, in which are earthen representations of certain objects of worship; the inner contains the images or symbols of the gods carved on trees, and the novice is so placed in the outer ring that he faces the passage and the shrine of the gods; he is turned to the east (see note, the eighth page of this paper).

(b.) The inner shrine is an arrangement common to all religions. At Babylon in the temple of Belus, which was built in stages, the worshipper had to pass through these seven stages of Sabæism before he reached the shrine; this was the topmost of all, and contained a golden image of the god; each of these stages was devoted to the worship of one

of the Babylonian gods. So also, in the Bora, the worshipper advances by stages along the passage leading from the one circle to the other, and pays his devotions to each of the images in succession. In Greece and in Rome the roofed temples were commonly arranged in two parts, an inner and an outer, and the statue of the god was so placed that a worshipper, entering by the external door, saw it right before him. At the very ancient temple of Dodonæan Zeus, in Greece, the god was supposed to reside in an oak tree, and it is quite possible that the *Xoanon*, or wooden image of the god, was here, as in other grove worship, merely a carved piece of oak as in the Bora. In this sense Festus gives *Fustis decorticatus* as an equivalent for *delubrum*. The student of Biblical archæology will also remember the Asherah of the Israelite idolaters, the consort of the sun-god Baal; this was a wooden pillar or statue of the goddess which could be cut down and burned. Such a pillar our black fellows also have been known to erect; for on one occasion several men of a tribe which is well known to me were seen to cut down a soft cedar tree; they dressed it with their hatchets, and cut the end of it into the rude figure of a head and face; they then carried it some distance down the river to a sandy spot, and, setting it up there like a pillar, they danced in a circle around it. This was certainly an act of worship, the same as many other acts of worship in the heathen world. Was it merely a happy thought on the part of these black fellows, or undesigned coincidence, which led them to do so; or was it a portion of an ancestral form of worship brought from other lands?

(C.) In the Bora, the novice in the outer circle has his body all painted over with red, but at the close of his novitiate he washes in a pool, is thereby cleansed, and then paints himself all white. The other members of the tribe paint themselves red and white for the ceremony; they, too, at the close, wash in the pool and retire white like the "boombat." This transformation is to them a source of much rejoicing.

(c.) Among the black races the colour red was the symbol of evil; and so Plutarch tells us that the Egyptians sacrificed only red bullocks to Typhon, and that the animal was reckoned unfit for this sacrifice if a single white or black hair could be found on it; in certain of their festivals the Egyptians assailed with insults and revilings any among them who happened to have red hair, and the people of Coptos had a custom of throwing an ass down a precipice because of its red colour. The god Typhon was to the Egyptians the embodied cause of everything evil, malignant, destructive, man-hating in the economy of nature, just as Osiris, the bright

and beneficent sun, was an emblem of all that was good. In the Levitical economy, the red heifer was a sin-offering for the Israelites, probably with some reference to the Egyptian ideas about this colour. In India, Ganesa, the lord of all mischievous and malignant spirits, is symbolised by red stones, and the Cingalese, when they are sick, offer a red cock to the evil spirit that has caused the sickness. The blacks of Congo wash and anoint a corpse and then paint it red, and their black brethren of Madagascar, when they are celebrating the rite of circumcision, never wear anything red about them lest the child should bleed to death. The negroes of Upper Guinea, far enough removed from Australian Boras to prevent even a suspicion of borrowing, make a similar use of the colours red and white; for in Benin, when a woman is first initiated into the rites which the Babylonians sanctioned in honour of their goddess Mulitta, she seats herself on a mat in a public place, and covers her head, shoulders, and arms with the blood of a fowl; she then retires for her devotions, and, these being finished, she washes herself, returns, and is rubbed all over with white chalk where the blood had been. The young ladies of Congo, also a black country, have a similar custom, but they besmear their faces and necks with red paint.

In Australia, those who pass through the Bora paint themselves white at its close. Everywhere in Australia there is the belief that the black man when he is dead and buried still lives, but he is then white; the aborigines say "black fellow jumps up a white fellow;" hence their name for white man is "wunda," a word which originally described only the black man in his spirit state after death. The father of a friend of mine was the first white man to enter, some fifty years ago, the territory of a black tribe near to where I lived; it so happened that the tribe had just lost their chief by death, and, as the white man whom they saw coming over the crest of the hill towards their camp bore some physical resemblance to the deceased, they soon got to hail him as their chief in the "wunda" state, and to this hour they claim that white man's son as one of themselves, a brother!

Now, in the ancient rituals, white was the colour sacred to the sun, the benign god, before whom darkness flies away. In India, white agates represent Siva, the eternal cause of all blessings; in Persia, white horses were sacred to the sun; in Celtic Britain, some of the Welsh people even now whiten their houses to keep away devils; and so with many other examples.

In these senses the "boombat" enters the Bora with the

brand of Typhon upon him, exposed to all evil influences, to disease and death from animals, men, and spirits; but after he has made the acquaintance of his fathers' gods, and has learned the sacred songs and dances of his tribe, he comes forth another man; he washes away the badge of darkness and evil, and assumes the livery of the children of light. The other men, whose mottled colour is a confession of mingled good and evil in their lives, also emerge new men once more, purified and devoted anew to the service of the good, and freed from the power of the evil.

This felt subjection to unseen evil and aspiration for deliverance from it in the minds of our native races, is not only natural to man everywhere, but was a marked feature in the whole system of Akkadian magic; for these old Chaldæans believed that innumerable spirits, each with a personality, were distributed throughout nature, sometimes in union with animate objects, sometimes separately. Existing everywhere, they had each both an evil and a good aspect, at one time favourable, at another unfavourable, controlling both life and death, regulating all the phenomena, beneficial or destructive, of air, earth, fire, or water. A dual spirit, bad and good, was attached to each of the celestial bodies, and each living being; a constant warfare existed and was keenly maintained between the bad and the good, and, according as the one principle or the other held sway, so did blessings or disasters descend upon nature and upon man. Hence the value of religious rites, such as the Bora; for the due observance of these, repeated from time to time, gave for a while, at least, the victory to the good spirits, and brought blessings to the faithful. Thus, then, I explain the red colour of the novice at the Bora; the red and white of the celebrants, and the white colour of the whole when the service was completed.

(D.) Ridley says that the Bora is Baiamai's ground. He adds: "Baiamai sees all; he knows all, if not directly, yet through Turramulan, a subordinate deity. Turramulan is mediator for all the operations of Baiamai to man, and from man to Baiamai." "Women must not see Turramulan on pain of death. And even when mention is made of Turramulan, or of the Bora at which he presides, the women slink away, knowing that it is unlawful for them so much as to hear anything about such matters."

(d.) We have seen that in some places an image of Daramulun is set up at the Bora. In another place, the bull-roaring instrument, whose voice begins the ceremony of the Bora and warns the women not to look, is called *tirricoty*, and is sometimes made in the shape of a fish; the magic

wand that Ridley mentions is called *dhūrumbulum*; and the great ancestral Bora ground of the Kamilaroi tribe in New South Wales is at *Tirri-hai-hai*. In Victoria this same roaring instrument is called *turndun*, which I think should be written *dhurru-m-dun*. All these names are identical, and only modifications of *dara-mūlun*; thus, with a slight alteration of the spelling, we have *turra-mul-un durru-m-dun*, *durru-mbulun*, *tirri-coty*, *tirri-hai-hai*. The root of all these forms I take to be *dara*, *dar*, Sanskrit *dri*, meaning to protect, a root found in all the great branches of human speech, and furnishing derivatives which mean "a prince," "a governor," "a lord," "a supreme ruler." I therefore take *Daramulun* to mean something like "Lord of the mysteries," for it is evident that he presides at the Bora, and is the source of the blessings therein communicated. The use of a fish-shaped roarer to indicate his presence leads me to compare him with the Chaldæan god, *Hoā*, *Hea*, half man, half fish, who, in the Chaldæo-Babylonian religion, was revered as the revealer of all religious and social knowledge. His abode was the sea, the Persian Gulf, where he passed the night, but by day he remained among men to instruct them; thus he became a legislator and protector. *Hea*, as a god, "seesthat all is in order," and, being acquainted with all sciences, he can baffle the powers of evil by his magic arts. With this I compare the "magic" shown by the Koradjie in the Bora in the presence of *Daramulun*'s image. The Akkadians, and from them the Babylonians, invoked the aid of *Hea*, when spells and enchantments were found unavailing against the power of demons. So in the Bora passage, when *Daramulun* had been duly honoured and magic influence conjured up for the driving away of all adverse spirits, the lad is taken into the inner circle and sees the gods of his fathers, and learns to know them and their attributes, just as in the greater Eleusinia of Greece the duly qualified were, after a course of previous preparation, led into the inner sanctuary in the darkness of night, and there, by a dim light, allowed to see and know the holy things.

(E.) The next step in the process of initiation is interesting: (1) a sacred wand is shown to the "boombat:" (2) he gets a new name; and (3) certain white stones are given to him.

(e.) (1) The wand. In this there is the notion of consecration and sacredness; for, on the Egyptian monuments, the deities are constantly represented as holding in one hand a long rod or wand, with a crook on the upper end of it. The king also, and some of the higher officers of state, carry this

"crook." In India we find that Yama, the regent of the South, has a name from a sacred staff or rod, and some religious impostors wear as badges of sanctity a "staff" and a deer's skin. The Magi of Persia carried the *Bareçma* or *barsom*, a divining wand as one of the badges of their ministry and the magicians of Egypt similarly had rods in their hands when they stood in the presence of Pharaoh. The traditions of Peru speak of a sacred golden wand borne by the son and daughter of the Sun. These are analogies; but the nearest approach to the use of the wand in the Bora is, I think, to be found in the Finnish Kalevala, where there is a reference to a "celebrated wand" (evidently as in Peru a sun wand) which protects its possessor from all spells and enchantments; even the gods are glad to use it against the powers of evil. (2) A new name. Having now acquired a knowledge of sacred things, the initiated is henceforth a new man, he is "twice born," and like his kinsman in Upper Guinea, already described, he will come out to the world in a new character, renouncing his former state. In India, a youth becomes one of the "twice born," by investiture with the sacred cord, receiving thus a spiritual birth; thereafter, like our "boombat," he passes into the hands of religious preceptors, who teach him the sacred prayers, mystic words, and devotional ceremonies. In more modern times, when a monastic house or a nunnery receives, from the world without, one more recluse, a new name is given by which he or she may thenceforward be known in religion. The underlying idea in all these instances is that a religious profession gives one a new character and a new relation to the rest of the world. And who will deny that this is true, whether the professor be black or white? (3) The white stones. I am inclined to think that the "boombat" receives only one of these at a time, and that the number of them increases according to the number of Boras he attends until he becomes a full and accepted master of the craft. In any case they are used as talismans, and are carried in the belt during the whole of the man's life. They are merely small pieces of quartz crystals, but are so sacred that they must not be shown to the women.* The negroes of Guinea use small stones as fetishes, which they carry about their necks or under their armpits. These the priests sell after a formal consecration. The white colour is a sun colour. It is beneficent

* *Moorl* is the name for the white crystals. A Koradjie, in the presence of a friend of mine, swallowed three or four small ones, saying, "That fellow stick there." He believed that the crystals would give him more power as a medicine-man.

and preservative against evil, as already shown; hence the Hindoos dedicate white stones to Siva, the eternally blessed one.

Under this head I venture to refer to the promise given to the Church in Pergamos (Revelation ii. 17) in these words: "I will give him a white stone, and in the stone a new name written which no man knoweth saving he that receiveth it." On this passage commentators have given the most diverse opinions in explanation of the white stone and the new name. The very diversity of their opinions leads me to think that in this passage there is a reference to some heathen and idolatrous rites well known to the Pergamenes, part, it may be, of the religion of their ancestors, as in the Bora ceremonies; for in the Bora there is the white stone and the new name which must not be divulged. I cannot stay to examine this curious analogy, but I think that some light might be got to illustrate the passage if one were to explore the source of the early population of Pergamos and its forms of worship. It will probably be found that both were in some way Chaldæan, and that the worship was very sensual and degrading, such as was the worship of Mulitta in Babylon. This would explain how it is that in the message to the Church in Pergamos the expression occurs, "I know where thou dwellest, even where Satan's throne is"; and again, "Among you where Satan dwelleth," the city being thus twice in one short message described as a stronghold of Satan; it would also explain the reference to "fornication," and "things sacrificed to idols," and "the teaching of Balaam." If I were for a moment to assume the garb of a commentator, I would paraphrase the promise to the Pergamene Church somewhat in this manner:—"To him that overcometh, that is, to him that rises above the abounding evil and remains faithful in his new profession, will I give . . . a white stone, a pledge of purity and a safeguard against the wicked practices so common among you where Satan dwelleth, and a new name to show that he has put off his former state of slavery to sin, and has become a new man in the service of a new master, who is pure, and holy, and undefiled."

(F.) The initiated lad is next led to a camp at a distance; he is kept there for eight or ten days receiving instruction, specially in songs and dances; he also eats here, and his confidence in divine protection is tested by hideous noises during the darkness of the night.

(f.) It is rather singular, as a coincidence, that Festus speaks of Roman ceremonies as lasting ten days, and that the Dionysia and the greater Eleusinia of Greece also lasted

nine or ten days, and that part of them was a solemn meal and a solemn bathing, or purification by water; thereafter instruction was given. So, also, a young Brahman must reside with his preceptor for some time, until he has gained a thorough knowledge of the holy books; he must pass through certain purificatory rites, which remove the taint of former sin; one of these is the cutting off of the hair, and with this seems to correspond the knocking out of a front tooth practised by some of our tribes in Australia.* The singing and the dancing are everywhere essential parts of the heathen worship, and the dance is in its origin religious.

(G.) Then come the washing and the purification which I have just spoken of, but after that they join hands all round, dance round the fire, and then jump into it and through it.

(g.) Analogies to this purification and protection by fire are abundant. In Bretagne, at this hour, the farmers protect their horses from evil influences by the service of fire. They kindle fires at nightfall; then, at dawn of day, the horses are led thrice round the fires, and a particular prayer, known only to a few, is said before the dying flame; as the last words are pronounced, they all leap on the embers with their feet joined. The ancient British Kelts, to which stock the modern Bretons belong, did much the same thing. On May Day the Druids used to light large fires on the summits of the highest hills, into which they drove their four-footed beasts, using certain ceremonies to expiate the sins of the people. Until very lately, in different parts of Ireland, it was the common practice to kindle fires in milking yards on the first day of May, and then many women and children leaped through them, and the cattle were driven through in order to avert evil influences. In ancient Rome, on the feast of Pales, in April, the same forms of purification and dedication were observed. The Hottentots of the present day retain the old customs, for they make their cattle pass through the fire as a preservative against the attacks of wild dogs. In India, the youth, when about to be invested with the sacred thread, stands opposite the sun and walks thrice round the fire, and in the marriage ceremony the bride is led thrice round the sacred fire. An incantation used by the oldest Chaldæan sourcerers has these words: "May the god Fire, the hero, dispel their enchantments or spells for the injury of others." An Australian *gin*, going to the river to fetch water after nightfall, carries for protection a burning stick; and the men

* In some parts of Australia the hair is cut off or singed off in the Bora.

in the camp, when they think an evil spirit is near, throw firebrands at him to drive him away. We may not wonder, then, that our Australian black fellows, if, as I believe, their ancestors came from Babylonian lands, have not forgotten the fire observances, and still trust in the protection of the fire-god.

So far the Bora and its analogies. I have thus considered at some length the institution of the Bora, both because it is the most important of all the social regulations of our aboriginal tribes, and because its universal distribution among them, although with slight local differences in the manner of its celebration, seems to me a strong proof that our black tribes are all brethren of the same race, and that they are of the same common origin as the rest of mankind, their nearest kin being the blacks of Africa. Is it possible that so many tribes, differing in language and confined by their laws and habits each to its own hunting ground, should have evolved from their own consciousness ceremonies so similar, and which, when examined, correspond in so many points with the religiousness of the ancient world? How is it that the blacks of Australia and the blacks of Guinea have similar ceremonies of initiation? Is it not because they have come from the same ethnic source and have a common ancestry and common traditions?

And now to complete the task which I proposed to myself, I would add a few words of aboriginal mythology, as another point in the argument for the unity of the human family.

Our native races are attentive observers of the stars; as they sit or lie around the camp fire after nightfall, their gaze naturally turns to the starry vault above, and there they see the likenesses of many things with which they are conversant in their daily life; young men dancing a corroboree (Orion) and a group of damsels looking at them (the Pleiades) making music to their dance; the opossum, the emu, the crow, and so on. But the old men say that the regions "above the sky" are the home of the spirits of the dead, and that there are fig-trees there, and many other pleasant things, and that the head of them is a great man *Minny*; he is not visible, but they all agree that he is in the sky. A greater than he is the great Garabooong, who, while in earth, was always attended by a small man, but now the two shine as comrades in the sky—the "Heavenly Twins." Both Garabooong and Minny are "skeletons." In his mortal state, Garabooong was a man of great rank and power; he was so tall that his feet could touch the bottom of the deepest rivers; his only food was snakes and eels. One day, not being hungry, he buried

a snake and an eel ; when he came back to eat them he saw fire issuing from the ground where they were ; he was warned by his companion, the little man, not to approach, but he declared he did not fear, and boldly came near ; then a whirlwind seized them and carried them up "above the sky," where he and his companion still are, and "can be seen any starlit night."

These two legends are interesting. Minny is to them the father and king of the black races, whom he now rules and will rule in spirit-land ; he was once a mortal, but now he is a "skeleton"—a spiritualised being without flesh and blood ; and so our black fellows retain the simple primitive beliefs of mankind ; they have heard nothing of annihilation or absorption into the infinite. I observe also that the name of their great father is the same as that given on the hieroglyphic inscriptions to the first king of Egypt, Menec—by Herodotus called Menes—the head of the First Dynasty of mortals. He was a public benefactor, for he executed several important works, and taught his people the worship of Phtah, the great artificer-god of Egypt. He must have some mythical relation to the human race, for in Greece he is Minos, king of Crete, "Minoia regna," author of many useful laws, and afterwards a judge of the shades of the dead ; in another part of Greece he is Minyas, the founder of a race of heroes ; in India he is Menu, and in Old Germany Mannus ; for I take all these to be the same name.

The story of Garabooung seems to correspond with that of the Dioscouroi—Castor and Pollux—who were also mighty heroes and benefactors of mankind. The ancient Germans worshipped them in a sacred grove, and called them Alcis.

How have our black fellows got hold of the name Minny, and such a myth about him ? Were the name and the myth invented by them ? Are they not rather a survival—derived from a common origin—of traditions which belong to the once undivided human family ?

In conclusion, let any one ask me how it is that our aborigines, if they are of such an origin as I assign to them, have sunk so low in the scale of humanity as to be regarded among the most degraded of the races of men. I deny that this estimate of them is well founded ; on the contrary, I assert that it was formed long ago by those who imperfectly understood the habits and social organisation of our native tribes, and has been ignorantly passed from mouth to mouth ever since ; that, when they are thoroughly understood, our black fellows are not the despicable savages that they are too often represented to be. They have, or had, virtues which

we might profitably imitate; for they are faithful and affectionate to those who treat them kindly; they have rules of family morality which are enforced by severe penalties; they show the greatest respect to age; they carefully tend and never desert the sick and infirm; their boys are compelled to content themselves with meagre fare, and to bring the best of the food which they have found and present it to the aged members of the tribe and to those who have large families. I am assured by one who has had much intercourse with them for thirty years that he never knew them to tell a lie, and that his property was always safe in their hands; another who has been familiar with them since he was a child says:—“Naturally they are an affectionate, peaceful people, and, considering that they have never been taught to know right from wrong, their behaviour is wonderful; I leave my house open, the camp close by, and feel the greatest confidence in them.”

Then, again, although the material civilisation of the world was commenced by the race of Ham, yet the task soon fell from their hands, for morally they were unfit for it; for the conservation and first dissemination of a pure and ennobling religion we are indebted to the race of Shem; while the sons of Japheth have gone forth to rule the earth and the sea—“*audax Iapeti genus*”—and to spread abroad the blessings of good government and the arts and inventions of an enlightened age to the remotest lands. The Hamites, on the other hand, have continued to sink in the social scale, have been persecuted and oppressed by the other races and thus debased; and whenever, as in Australia, the sky above and the earth beneath have conspired to render the means of life to them meagre and precarious, there the process of decay has been accelerated, and physically their condition has been very low; but still, among their social institutions, we have this evening, I trust, seen traces of their having once enjoyed a better state of things. Would that we had a full record of what they really are before they pass entirely away from among us!

THE CHAIRMAN (D. Howard, Esq., F.C.S., &c.).—I am sure that all present would have been glad if the author of the paper could have been here to receive our thanks for the very interesting and valuable information he has been the means of placing before us on

a subject of so much importance. Such records as these of what is to be learned of the far distant races of the world are indeed of great value. It is true that the idea has gained ground, in not few quarters, that the aborigines of Australia are so utterly degraded and so devoid of the ordinary distinguishing marks of humanity that they can hardly be said to be men at all, or, at any rate, men of the same species as ourselves. But the testimony we have had to-night from one who has long lived among them, and who, therefore, speaks of his own knowledge, is extremely valuable, inasmuch as it presents a very different view, and makes it clear that those who take the trouble to become acquainted with these races, and by treating them with kindness come to know them intimately, are able to tell a very different story from that which is told by those who have only come in contact with them to tyrannise over and ill-treat them. It has been frequently and boldly stated that the aborigines of Australia have no religious customs. I am afraid that a great many ignorant people are too apt to be shy of making their religion public, so that others may conclude they have none at all; why, therefore, should we suppose that the habit of reticence which induces so many to keep their religious feelings in the background is not to be met with in other races than our own? Is it not a rule that, what men care most about, they talk least about, especially before strangers? And, if this be so, ought we not, when we find it stated that such and such a race is entirely devoid of any religious feeling or sentiment, to assume that the assertion is made from want of knowledge, and that in all probability the contrary is the fact. We know it is being brought out more and more clearly that the negro race, whose fetish worship we have heard so much about, know nothing about fetish worship, such as is frequently described; and, therefore, if most of the statements that have been made about them are unreliable, so also may be those that have been put forward with regard to the Australian aborigines, whose very remarkable religious customs have been traced out by the author of this paper, as well as the extraordinary connexion that exists between their religious customs and those practised by the black race in Africa. It is, consequently, for those who say that these natives of Australia are not of the same race or nature as our own, to explain how the religious ideas, of which we have now heard, can have sprung up independently, especially the idea of that dim, shadowy kind of

regeneration, or second life, which would seem to be a part of their religious system. It is very interesting to trace the customs that are so strongly developed in this,—ethnologically,—out-of-the-way corner of the earth, and to find expressed, in the manner related by the author of the paper, the idea of the mysteries of initiation, as well as other ideas that have been rendered familiar to us through the classical literature which describes the Eleusinian and other mysteries, derived no doubt from Egypt, which were from a Hamite source; and these we find, in almost every feature of the familiar type, developed in the far-away portion of the earth with which we have been dealing. I hope that those present who may have something to say on this subject will now give us the benefit of their views.

REV. F. A. WALKER, D.D., F.L.S.—On page 13 it is stated that “the *pomærium*, or circuit of the walls of Rome, was a sacred ring, and the circus was consecrated to the sun and was open to the sky.” I should like to say that there is much in the nature of a counterpart of this, on a small scale, still extant in the ruins of Ephesus. There is a circular platform evidently, at one time, part of the shrine of the sun, and having a circular base; in the middle there is the corolla of a flower and around it the remains of what would exactly have resembled the petals of the sunflower. It is not part of the circus, and it may be as well to mention that it is very near the *stadium* or racecourse which still exists there.

A VISITOR.—I have lived for a while in Australia, and as regards the native belief in a God I may state that I have, in the course of my travels, come across a great many cases in which men of the very lowest type have shown that they all had some idea of religious worship, and my conclusion is that the reason for this is to be found in the fact that God has put into their minds faculties which compel them, as a matter of necessity,—of absolute necessity,—to worship Him, and the more we analyse the minds of men the more, I think, shall we be inclined to come to this conclusion.

REV. H. WALKER-TAYLOR.—As an Australian clergyman I venture to say just a few words on what the writer of the paper has brought before us. I am sure we are all very much indebted to the author for having dealt so ably with a subject which, in many of its aspects, is comparatively unknown. I certainly do object to the idea that has been getting abroad for many years that the aborigines of Australia are a degraded people. Any one coming in contact with them, and

knowing their religious traditions, must see that those traditions are based on something more ancient and something which shows that they hold the idea of a spiritual being, and that they look on the curious life of this world as a life of work and thought, having relation towards a life of action and thought to come. One who knows a great deal of Australia and the Australians, says that the ordinary idea of omnipotence, goodness, and eternity is distinctly characterised in the religious ideas of the Australian natives. As to the proposition which has been advanced that these people came from India, there would appear to be good grounds for that supposition, as shown by certain similarities of phrases and the resemblances which point to a migration through New Guinea, the people who established themselves in the northern part of Australia having evidently penetrated that country from the southern part of New Guinea, going afterwards south-west, and thus overspreading the continent of Australia. This, at any rate, is the idea of those who have looked into the question. Tradition certainly seems to point to the Australian aborigines coming from the north. Ridley (perhaps the chief authority amongst the many devoted missionaries and laymen who have lived amongst them and investigated the history and customs of the race) speaks of a tradition about the first landing of man on the north-west coast of Australia from Java. He says, moreover, "it has been shown out of their own mouths, from their songs and their cherished traditions, that they are by no means destitute of some qualities in which civilised men glory; such as the power of inventing tragic and sarcastic fiction, the thirst for religious mystery, stoical contempt of pain, and reverence for departed friends and ancestors. It may be affirmed, with some reason, that they have handed down with reverential care through many generations, a fragment of primeval revelation. The manner in which they have displayed these characteristics present to us such a strange mixture of wisdom and folly, of elevating and degrading thoughts, of interesting and repulsive traditions, of pathetic and grotesque observances, that in order to account for the apparent contradictions, we must have recourse to *the supposition of an ancient civilisation from which this race has fallen*, but of which it has *retained some memorials*." I need not now say more than to express my sincere pleasure at the full and careful treatment of this most important subject exhibited in the paper of Dr. Fraser. The poor aborigines have been for well-nigh a century hardly the better

for English civilisation. They have been despoiled, degraded, and neglected by the Anglo-Saxon race who occupy their lands. It is well that this paper has been introduced to the notice of the members of this Institute, if only to give new impetus and a new motive to the movement at the antipodes for more righteous and brotherly attention to the material and spiritual wants of our fellow-subjects, the aborigines of Australia.

The meeting was then adjourned.

REMARKS ON THE FOREGOING PAPER.

BY THE REV. MYRON EELLS

(Of Pacific University, United States).

I have been very much interested in this paper, because it bears strongly on a subject on which I prepared a paper, which was read in 1885 (see *Transactions*, vol. xix.),—the bearing of the religious ideas of the natives on the unity of the race, and other principles of the Bible,—my paper having had reference to the natives of America, while this one refers to those of Australia. It seems evident from their geographical position, that, next to America, the islands of the Pacific Ocean are the most difficult of access by immigrants from that part of Asia where it is believed that Adam was created, and hence the most likely to be the centres of other human creations, if there were such. Hence, everything which tends to show that the inhabitants of these islands were formerly connected with that part of the human race which inhabits the Eastern continent is specially valuable. Realising this, and my interest in the subject having grown since I wrote that paper, I have, as opportunity offered, examined some works on several of those islands, in order to see how much their religion agrees with that of the Bible. Mr. A. W. Howitt, F.L.S., F.G.S., in a paper in the *Smithsonian Report* for 1883, on the Australian group relations, speaks of their belief in a Supreme Being, and their very great reverence for Him, even in pronouncing His name, and he gives this name in the languages of several of the tribes. W. B. Wildy, in a work on Australasia and the Oceanic region (p. 116), says that the Larrakeyahs and Woolnahs do not practise circumcision, but all the other tribes do; and that the custom is purely traditional. He adds that they are afraid of an evil spirit called Brawl; and that under the trees, up which they bury their dead, they will smooth down the grass in order to detect

any visitation of Brawl; also that before retiring at night, they take a light and hunt around, calling out "Brawl! Brawl!" as if to bring him from his hiding-place. These are the Northern Australians, very low in the scale of civilisation, wearing almost no clothes, eating roots, grubs, worms, the larvæ of ants, lizards and snakes, and practising cannibalism to some extent. Sir John Lubbock, in the Smithsonian Report for 1869, in a paper on the social and religious condition of the lower races of man, also speaks of the belief of the inhabitants of Australia in spirits and a kind of devil, who is spiteful and malevolent, but weak, and dangerous only in the dark. But the paper just read is a most valuable one, and I hope the author will follow up his studies on the subject much farther. There are some things spoken of in this paper which remind me of practices among some of the natives of America. In regard to the ideas of the natives of America about a mediator, and dancing as a mode of worship, I would refer to my paper (*Transactions*, vol. xix., pp. 313, 319). There are among the Indians in Washington Territory, in the north-western part of the United States, two sacred styles of worship practised, called respectively the Red Ta-mah-no-us and Black Ta-mah-no-us, or religious ceremonies. The former derives its name from the red paint with which they paint themselves during its ceremonies. It is by far the most common of the two kinds, is open to the public, and is the usual way which many of them have of occupying the stormy winter days and long evenings. It is often practised by a few persons, and at any time and place, though sometimes considerable preparation is made for it. Any person may engage in its ceremonies, who has obtained his ta-mah-no-us, or guardian spirit. In order to get this, a young man (or woman) goes into the woods alone, where he remains eight, ten, or twelve days, with little or nothing to eat, but during which time he washes himself constantly. While there his ta-mah-no-us is revealed to him in the shape of some animal, which ever after is sacred to him: that is, his guardian spirit dwells in this animal. The latter, or black ta-mah-no-us, takes its name from the black paint which is used, especially on the face, during its ceremonies. This is a secret society, with certain ceremonies, which are public, but the meaning of which they do not tell. The ceremonies of initiation and observance afterwards are only practised at some of the large gatherings. I have seen them but once, when they occupied six or eight days, but I have heard of their lasting two months. Their faces were painted black in various ways, in stripes or spots, or with a part or the whole

of it completely black. About the close of it, the candidates were washed for a long time. In fact, washing and purification constitute an important part of the initiatory ceremonies of both of these modes of worship, and also when a person becomes a medicine man. In both of these we see the period of eight or ten days mentioned in the paper just read, but more especially in the red ta-mah-no-us, whose object is to enable the candidate "to commune with the spirits," as the paper says (p. 5). In the latter, the secret society is plain, and the ceremonies are performed in great state, as in the Bora. Tradition says that this latter originated in British Columbia, in a mythological way. In the practice of the ceremonies of the red ta-mah-no-us, I have seen persons dance around a large fire, clothed with a red blanket, holding a stick in the hand, with face and eyes askance, so that I was forcibly reminded of an old witch with a wand in her hand. This stick was sacred, and the object of the performance was to purify the persons from sin. Singularly enough, however, the red paint is not considered as the symbol of evil, but of good. The tradition of the Skokomish Indians is that, long ago, when a previous race, the progenitors of the present one, dwelt here, the Klik-i-tat Indians of Central Washington came to Skokomish and engaged with those of Skokomish in a great game of gambling. The Klikitats who were painted red, won the game. In process of time, Dokibat, a kind of deity, incarnate, came and changed the people into earth, the Skokomish Indians being changed into the hills on the west side of Hood's canal, which are of common clay colour, and the Klikitats being changed into hills on the east side, where is a bank of red clay, the remains of the red paint, which was on the Klikitats. To that place the Skokomish Indians go for the red paint, which they use in gambling and religious ceremonies, as they believe it to be an omen of good. The circle and sun mentioned in this paper also have their counterpart in America. The ancient civilised nations of Mexico and Peru, and also less civilised tribes, as the Natchez Indians of Louisiana, the Dakotas, whose sun dance is one of the most savage of their religious ceremonies, the Blackfeet, Clallams and Makahs of the northern part of the United States, and the Pueblos of New Mexico and Arizona, all worshipped the sun. Many of these people built temples to it, and there are remains of sacred places in the southwestern part of the United States in circles, which are believed to be the ruins of ancient temples, and which have reminded me of

the circles mentioned in this paper. There is evidence also to believe that the Ancient Mound builders worshipped the sun.

BY MR. HASTINGS C. DENT, C.E., F.L.S.

There are many points in this important paper upon which I should like to write, but my stay in Australia was so short that though I ascertained a good deal, I must not do more than say that all I heard there is confirmed by the author. To study the links between distant nations or people as proved by any similar religious traditions as practices which they respectively hold, is a most valuable sphere of work. May I mention one point upon which the author seems to contradict himself, viz., the two passages on the second page of the paper where he denies "that religiousness is a thing of man's own invention," &c., and the allusion to the "red heifer" of the Israelites, offered "probably with some reference to the Egyptian ideas about this colour." There appears to be in this a tendency to state that the Hebrew records which we hold to be the inspired Word of God, adopted heathen customs. Is it not a much more reasonable—as well as a more lofty—view, to hold that the oral inspiration given to the primeval nations was the *true* origin of the degraded mythologies which we meet with in the most ancient religions? And that this oral inspiration was the preparation for the elaborate system of type and ritual revealed eventually to Moses, and by him reduced to writing. I would have liked the author, as he was dealing with the "religiousness of nations," to say something as to the capability of the Australian aborigines to understand and accept the Christian religion, and their receptivity as to civilisation, &c. I venture to suggest that had the author, with his wide experience, given us some information on this subject, the practical value of the paper would have been very considerably enhanced. I heard and have read much as to the great success of mission work among the natives, both by Roman Catholic and Anglican Missionaries, but had no opportunity of seeing it. But as regards capacity for civilisation, I met some black boys from Western Australia and the Northern Territory, ages from ten to thirteen years; they were travelling on board my steamer from Port Darwin to Brisbane and other parts of Queensland, so I had an opportunity of gauging their powers, &c. They were returning as servants to some miners who were going home after an unsuccessful hunt for gold,

The boys had been taken from the wild tribes, had had no more than a few months' intercourse with white men, yet could talk English well, were very intelligent, and sang English songs very prettily. From all I gathered in Australia (and I visited every part between Port Darwin, along Queensland, down to Adelaide) these aborigines,—reputed to be one of the lowest races of mankind,—appear to have in them all the powers with which man is endowed, and the rising generation is capable of being formed into respectable civilised and religious communities. Of course, from Port Darwin to Brisbane was the most available field for inquiry, as the natives there have not been so entirely “wiped out,” or, at least, are more easily reached than in New South Wales, Victoria, or South Australia. In fact, from all I gathered, this appears to offer the greatest opportunities for success of all the foreign fields of mission work that I have seen.

Analogy (*d*), “the fish-shaped roarer,” which the author compares with the Chaldæan god, half man half fish, requires notice, as to the wide-spread relics of fish-worship. The god Vishnu (of India) is described as “incarnate, in the form of a *fish*, to recover the sacred books lost in the Deluge.” The fish was worshipped by the Cuthites or Phœnicians, and relics thereof appear abundantly in Ireland (in which country the round towers are perhaps the best known remains of this very early race). On one of the ancient and beautiful pre-Christian crosses at Kells, county Meath, I have lately seen a carving of six men on their knees worshipping a huge fish as big as themselves. When I was at Fuchau, on the Min river, in China, in October, 1886, I visited the Kushan (Buddhist) monastery, situated aloft in the seclusion of a mountain dell; there is here a huge tank or pond full of sacred fish, mostly perch, some of which are an enormous size. The worshippers at these shrines can, for a few “cash” (a cash is about 1-25th of a penny), buy a lot of biscuits, which they throw into the pond, and immediately the holy fish rise in hundreds to the surface and devour the offerings of the devotees.

The mention of fire worship in Analogy (*g*) is rather too brief. The author might at least have said that this is none other than the worship of Baal. Abundant traces thereof are preserved to this day in Ireland, in names of places or dedications of ancient temples to Cuthite demigods transformed into Christian saints, all of whom are now represented as having lived about the time of St. Patrick, but there yet remains a tradition at Glenda-

lough, co. Wicklow, that in ancient times the heathen priest used to ascend the fine round tower (which has been lately restored) and at sunrise called aloud the name of Baal four times, once from each of the four openings or windows at the summit of the tower, which face the cardinal points of the compass. (Cf. 1 Kings xviii. 26, &c., as to Baal among the Israelites.) Apart from the religious links of affinity between nations, and quite outside the limits of discussion of Mr. Fraser's paper, is the last word I would like to add, but it may perhaps be ruled "out of order." It is, however, an instance of how a link may be traced which has never been thought of. The case in point is the affinity of the Indians of Alaska with the Botocudos of Eastern Brazil. I had the opportunity of attending a recent meeting of the Royal Geographical Society, when a paper was read by Mr. Stearn on his explorations of the Rio Dôce in Brazil, and his sojourn among the Botocudos for a month. In the discussion, Mr. Colin Mackenzie (whom I met in Brazil in 1884) stated that he had traced the custom of the monstrous lip-disc worn by the Botocudos, from the eastern coast of Central Brazil, through the interior, by Central America, to the West Coast in California and thence up to Alaska, where the custom is also found to-day.

REPLY BY THE AUTHOR.

I have to thank the Chairman and those who have taken part in the discussion for their kind approbation of my paper. I may be allowed to state that it was written to combat the theory held by some ethnologists that our Australian blacks are a race distinct from the rest of mankind. Against this theory my argument is briefly this :—The blacks of Western Africa have certain rites and ceremonies, evidently of a religious and sacred character, through which young men have to pass at their opening manhood. The blacks of Australia have similar ceremonies, of a similar import, and in some particulars, identical with those of Africa ; therefore these two races must have drawn their rites of initiation from a common origin and a common source, for it is impossible to believe that two races of mankind, now located so far from each other, and with no opportunities of contact for thousands of years bygone, should have, apart and of themselves, worked out the same beliefs by mere thinking. My introductory remarks, to which Mr. Stephenson refers, were meant to say that man is found to have everywhere a share in the common religious instinct planted in him by God, and, it may be, in a common primitive revelation given by God. All mankind are therefore in this respect homogeneous, but if men were found anywhere who were void of this instinct, the mere use of the thinking faculty would not lead them to religious beliefs and acts of worship.

As to the "red heifer," I should have expressed my meaning more accurately if I had said the red colour of the heifer in the Mosaic ordinance had probably some reference to the notions about that colour which we find among the Hamite races, of which the early Egyptians were a part. I did not intend to say that any portion of the Mosaic ritual was borrowed from the Egyptians. To the white race black is the evil colour ; to the black race white is the spirit-colour, and red is evil.

As to the analogies which may be drawn from Baal worship, I spoke of them as briefly as possible, because they are so well known in Britain.

I may here be asked how I came to possess a full account of the Bora ceremonies, when the blacks hold them as sacred, and will not divulge them. So silent are they on this point that, so far as I know, no one had previously obtained, or at least published, full information about these ceremonies. Well, about sixty years ago it was the custom in this colony for the Government to give grants of Crown land of considerable extent to immigrant gentlemen who were in a position to occupy and improve the land. The father of a friend of mine got a grant in this way, and went to take possession. As I have explained in the paper itself, he was coming down the hill towards the spot where he intended to build his house, when a tribe of blacks camped there rushed off in alarm, taking him to be "Wunda," a spirit; but, reassured by his gestures, they came near, and finding him to resemble a chief of theirs, who had just died, they claimed him as one of themselves! His son, as might be expected, grew up on terms of intimacy with the blacks on the estate, and has always treated them with kindness; they will tell him anything. At my request he got a young black, who had just been initiated, to tell him all about the Bora. I have in various ways tested information thus given, and I am convinced that it is full and accurate.

In the month of September, 1888, there was some correspondence in the *Times* on the subject of Australian arithmetic. A distinguished authority there says, "One of the clearest indications of the low mental power of savages is that afforded by arithmetic." It seems to me that this statement is too general; for even, although the power of counting up to high numbers were wanting in a savage, it does not follow that his mental powers in general are low. Perception, cognition, and memory are mental powers; but if Sir John Lubbock's memory were weak and yet the cognitive and perceptive faculties remained strong and vigorous, it would be unjust to say that he is a man "of low mental power." Colonists who have been long familiar with the blacks of Australia, with one voice cry out against the assertion that they are of low mental power, and could give hundreds of instances to the contrary. A friend of mine who, in his boyhood, fifty years ago, was much in contact with the tribe in the midst of which his father had settled, has told me that two black boys, his companions, were "out and

out good chess-players, taking plenty of time to study the moves, and showing great patience and calmness; these boys never went to school, and yet they could count up to a thousand." It is very clear that mental power was there, in these boys, but unseen and dormant, like seed in the ground, until circumstances led to its being developed.

Sir John Lubbock also says, "In no Australian language is there any word for 'five.'" This is not quite correct, for I know at least two large tribes (and there may be others that I do not know of), the one in Queensland and the other in the south-east of New South Wales, which have single words for "five," and in each case the word "five" is formed from the native word meaning "hand." As to the general question—the counting of numbers—I believe that a careful analysis of the numerals used by the Aryan family of languages will show that the base of them is *one, two, three*, and no more, *three* being in many religions a sacred and complete number; and that the other digits are expressed by words equivalent to one-three, hand, hand-and-one, hand-and-two, two-four, one-wanting two hands. If it should be proved that the Aryans, now the most civilized of races, originally said *one-three* for four, why should our Australians be considered "of low mental power" because they say *two-two* for four? Indeed, I am inclined to think that our Australians count in the more natural way, for they see nothing in or around them arranged in threes; the birds and beasts go in pairs; they themselves have two feet, two hands, two eyes, and so they count by twos. If the Australian blacks separated from the parent stock of mankind at a time when the common numeral system was still limited to *one, two*, or *one, two, three*, then their case is merely one of arrested development, their environment being unfavourable after separation; or if they ever had a developed system of composite numbers, these have fallen into disuse through the operation of a law of nature, for their wants are few and they live so much from hand to mouth that they had no need for high numbers. Their neighbours in Polynesia, who have plenty of fish to count, and bunches of bananas, and yams, and taro and cocoa-nuts, have developed many peculiar expressions to indicate the number of these, but our black fellow, who is well pleased when he is able to sing of the capture of "*wakulá, boolará bundarrá*" (one, two kangaroos), and whose only property is two or three spears, clubs, and boomerangs, does not require to use high

numbers in his daily speech. Nevertheless, when it is necessary, he counts 10, 20, 30, 40 by closing and opening his hands, and then for higher numbers he contents himself with saying "Many, many."

For these and other reasons it is desirable that men of science in Britain should be careful in building theories upon what is said about our Australian aborigines; much of the information they have about them is unreliable, for it has not been gathered by competent observers or tested on scientific principles.

N O T E.

Professor Max-Müller, in his "Selected Essays" (volume ii., p. 27), makes the following interesting remarks:—

"Looking at a report sent home lately by the indefatigable Governor of New South Wales, Sir Hercules Robinson, I find the following description of the religious ideas of the Kamilarois, one of the most degraded tribes in the North-Western district of the colony:—

"'Bhaiami is regarded by them as the maker of all things. The name signifies 'maker,' or 'cutter-out,' from the verb *bhai*, *baialli*, *baia*. He is regarded as the rewarder and punisher of men according to their conduct. He sees all, and knows all, if not directly, through the subordinate deity *Turramûlan*, who presides at the *Bora*. *Bhaiami* is said to have been once on the earth. *Turramûlan* is mediator in all operations of *Bhaiami* upon man, and in all man's transactions with *Bhaiami*. *Turramûlan* means 'leg on one side only,' 'one-legged.'

"This description is given by the Rev. C. Greenway, and if there is any theological bias in it, let us make allowance for it. But there remains the fact that *Bhaiami*, their name for deity, comes from a root '*bhai*,' to 'make,' to 'cut out,' and if we remember that hardly any of the names for deity, either among the Aryan or Semitic nations, comes from a root with so abstract a meaning, we shall admit, I think, that such reports as these should not be allowed to lie forgotten in the pigeon-holes of the Colonial Office or in the pages of a monthly journal."—Ed.

AN EXAMINATION
OF
MR. HERBERT SPENCER'S
THEORY OF THE WILL.

BY
THE REV. W. D. GROUND.

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*AN EXAMINATION OF MR. SPENCER'S THEORY OF
THE WILL.* BY THE REV. W. D. GROUND.

WE saw in a former Paper that Mr. Spencer made common cause with the Realist Philosophers in asserting that the deliverance of consciousness must take precedence of all conclusions arrived at by a process of Reasoning. In holding such an opinion he shows his own good sense, his philosophical grasp and acumen, his clear scientific conceptions, and his determination to found his system on none of the mere alluvial strata of the Mind, but to get down far beneath to the solid rock which is underlying all. Here we can be completely at one with him. Any product of Reason, any conclusion arrived at by Reason, can, in the nature of the case, only be an elaboration of the materials given by consciousness, and it is far better, if we want to know what is in consciousness, to examine and analyse its primary elements, rather than a finished elaboration of these, into which some other element may have been imported. Every man of science acts on this

principle, and it is manifestly a dictate of common sense. A recent writer contends that Mr. Spencer's "metaphysical principles are empirical."* By this he can only mean that because Mr. Spencer shows that the Logical Laws are the slow growth in us, through unnumbered organisms, of much humbler elements of Mind, therefore they have been acquired by and are the result of the experience of those organisms. In my judgment such an argument is neither sound nor just, and it admits of a most effective rejoinder. Mr. Spencer may reply that, so far from deriving those Logical Laws from experience, he is, on the contrary, showing that they are the simple outgrowth of the one *à priori* principle which runs throughout the universe; he is showing that their roots stretch far away down, deeper than all things; he is assigning them an antiquity compared with which the date the Professor affixes makes them but of mushroom growth, and is giving them an authority which makes his *à priori* canon nothing more than their humble vassal.

So much Mr. Spencer might say on the ground of his synthetic system alone. But when in addition, in his analytic system, he expressly sets aside all possible rivals of the simple deliverances of consciousness, and proclaims his adhesion to consciousness alone, then it seems to me only fair and just to accept his disclaimer, and to regard his system as an honest attempt to found only on consciousness. The *à priori* is his structural element; his metaphysics are not empirical.

We have now to examine his Theory of the Will. He denies to the Will all moral freedom, taking up the position of the Philosophical necessarian. Now, if Consciousness could be clearly shown to assert that we have a sense of moral Liberty, Mr. Spencer could be proved to contradict Consciousness on this point. No doubt some of the greatest Philosophers, including Kant, Jacobi, Hamilton, contend that Consciousness does give us this sense of Freedom, and they attach to it the greatest possible importance. But others as strenuously deny it, and there is no more vexed question in all Philosophy. Leaving this, then, for the present at least, let us look at Mr. Spencer's reasoning on the matter.

Now, if Consciousness really asserts that we are morally free, there must be some break in Mr. Spencer's logical chain, since he asserts the exact contradictory. If, then, on examination we find such a break, it will so far be an evidence that Consciousness does make the assertion, and we shall then

* Professor Fairbairn, *Contemporary Review* for July.

be in a position, when Mr. Spencer's arguments are swept out of the way, to look carefully and dispassionately at the whole matter. We shall find, I think, that here Mr. Spencer is singularly weak—so weak, indeed, that what he says scarcely deserves the name of reasoning.

Let us, then, examine his theory.

Mr. Spencer's Theory of the Will is one of the most original and remarkable parts of his Philosophy. It will be remembered that he makes what is subjectively Mind to be, in its objective aspect, currents or motions of nervous molecules. He makes what we call Will, or an act of volition, to be the commingling, in one definite stream of force, of a number of those nerve currents, which, in a previous state of indecision, were colliding one against another. It is like many rivers debouching into a lake; they come rushing pell-mell; and this confusion in the currents represents, in its subjective aspect, the time of uncertainty; until, at length, one adverse stream has neutralised another, the lake becomes calm, and the one unobstructed current flows on; which current is the resultant of all the streams that there met. Thus it will be seen that Mr. Spencer's theory utterly denies the existence of any determining element in the Will itself; it makes the whole process to be merely mechanical, nothing more than the mixture of nerve molecules. Or to take another illustration of his theory from a contested county election. There are various polling places, where votes of various numbers are recorded—and these votes represent the different motives with their exact quota of weight—but *the result is arithmetically deducible from the completed polling-books*, and the delay in learning which candidate is returned arises, not from any contingency or uncertainty, but simply because time is required to arrive at the totals.

That such is Mr. Spencer's theory will be apparent from the following passages. He is describing what he calls Will, and he says:—

“On passing from compound reflex actions to those actions so highly compounded as to be imperfectly reflex—on passing from the organically-determined psychical changes, which take place with extreme rapidity, to the psychical changes which, not being organically-determined, take place with some deliberation, and therefore consciously; we pass to a kind of mental action, which is one of Memory, Reason, Feeling, or Will, according to the side of it we look at.”*

* *Principles of Psychology*, vol. i. p. 495 (2nd Edition, from which all quotations are made).

Again he says:—

“When the automatic actions become so involved, so varied in kind, and severally so infrequent, as no longer to be performed with unhesitating precision,—when, after the reception of one of the more complex impressions, the appropriate motor changes become nascent, but are prevented from passing into immediate action by the antagonism of certain other nascent motor changes appropriate to some nearly allied impression; there is constituted a state of consciousness which, when it finally issues in action, displays what we term *volition*.”*

Again he says:—

“An immense number of psychical states are partially aroused, some of which unite with the original impression in exciting the action, while the rest combine as exciters of an opposite action; and when, eventually, from their greater number or intensity, the first outbalance the others, the interpretation is that, as an accumulated stimulus, they become sufficiently strong to make the nascent motor changes pass into actual motor changes.”†

But, in order to show what is Mr. Spencer’s reasoning on the subject, I must trouble you with a long quotation. He says:—

“Long before reaching this point, most readers must have perceived that the doctrines developed in the last two parts of this work are at variance with the current tenets respecting the freedom of the Will. That every one is at liberty to do what he desires to do (supposing there are no external hindrances) all admit, though people of confused ideas commonly suppose this to be the thing denied. But that every one is at liberty to desire or not to desire, which is the real proposition involved in the dogma of free-will, is negatived as much by the analysis of consciousness as by the contents of the preceding chapters. From the universal law that, other things equal, the cohesion of psychical states is proportionate to the frequency with which they have followed one another in experience, it is an inevitable corollary that all actions whatever must be determined by those psychical connexions which experience has generated, either in the life of the individual, or in that general antecedent life of which the accumulated results are organised in his constitution.

“To go at length into this long-standing controversy respecting the Will would be alike useless and out of place. I can but briefly indicate what seems to me the nature of the current illusion, as interpreted from the point of view at which we have arrived.

“Considered as an internal perception, the illusion consists in supposing that at each moment the *ego* is something more than the aggregate of feelings and ideas, actual and nascent, which then exists. A man who, after being subject to an impulse consisting of a group of psychical states, real and ideal, performs a certain action, usually asserts that he determined to perform the action; and by speaking of his conscious self as having been something separate from the group of psychical states constituting the impulse, is led into the error of supposing that it was not the impulse alone which determined the action. But the entire group of psychical states which constituted the antecedent of the action, also constituted himself at that moment—constituted his psychical self, that is, as distinguished from his physical self.

* *Principles of Psychology*, vol. i. p. 496.

† *Ibid.* vol. i. p. 498.

It is alike true that he determined the action, and that the aggregate of his feelings and ideas determined it; since, during its existence, this aggregate constituted his then state of consciousness, that is, himself. Either the *ego*, which is supposed to determine or will the action, is present in consciousness or it is not. If it is not present in consciousness, it is something of which we are unconscious—something, therefore, of whose existence we neither have nor can have any evidence. If it is present in consciousness, then, as it is ever present, it can be at each moment nothing else than the state of consciousness, simple or compound, passing at that moment. It follows, inevitably, that when an impression, received from without, makes nascent certain appropriate motor changes, and various of the feelings* and ideas which must accompany and follow them; and when, under the stimulus of this composite psychical state, the nascent motor changes pass in actual motor changes; this composite psychical state, which excites the action, is, at the same time, the *ego* which is said to will the action. Naturally enough, then, the subject of such psychical changes says that he wills the action; since, psychically considered, he is at that moment nothing more than the composite state of consciousness by which the action is excited. But to say that the performance of the action is, therefore, the result of his free will, is to say that he determines the cohesions of the psychical states which arouse the action; and, as these psychical states constitute himself at that moment, this is to say that these psychical states determine their own cohesions, which is absurd. Their cohesions have been determined by experiences—the greater part of them constituting what we call his natural character, by the experiences of antecedent organisms; and the rest by his own experiences. The changes which at each moment take place in his consciousness, and among others those which he is said to will, are produced by this infinitude of previous experiences registered in his nervous structure, co-operating with the immediate impressions on his senses: the effects of these combined factors being in every case qualified by the physical state, general or local, of his organism.

“This subjective illusion, in which the notion of free-will commonly originates, is strengthened by a corresponding objective illusion. The actions of other individuals, lacking as they do that uniformity characterising phenomena of which the laws are known, appear to be lawless—appear to be under no necessity of following any particular order; and are hence supposed to be determined by the unknown independent something called the Will. But this seeming indeterminateness in the mental succession is consequent on the extreme complication of the forces in action. The composition of causes is so intricate, and from moment to moment so varied, that the effects are not calculable. These effects are, however, as conformable to law as the simplest reflex actions. The irregularity and apparent freedom are inevitable results of the complexity, and equally arise in the inorganic world under parallel conditions. To amplify an illustration before used:—A body in space, subject to the attraction of a single other body, moves in a direction that can be accurately predicted. If subject to the attractions of two bodies, its course is but approximately calculable. If subject to the attractions of three bodies, its course can be calculated with still less precision. And, if it is surrounded by bodies of all sizes at all distances, its motion will be apparently uninfluenced by any of them: it will move in some indefinable varying line that appears to be self-determined: it will seem to be *free*. Similarly, in proportion as the cohesions of each psychical state to others become great in number and various in degree, the psychical changes will become incalculable and apparently subject to no law.”

* There is evidently some mistake here, but those are the *ipsissima verba* of Mr. Spencer's work.

To reduce the general question to its simplest form : Psychical changes either conform to law or they do not. If they do not conform to law, this work, in common with all works on the subject, is sheer nonsense ; no science of Psychology is possible. If they do conform to law, there cannot be any such thing as free-will.*

If now we carefully take to pieces this tissue of elaborate argument, we shall find, I think, that there is hardly one sentence in it which does not contain either a glaring misstatement, a palpable fallacy, or a clear *petitio principii*. Let us take the sentences in order.

1. In sentences two and three he says that "the real proposition involved in the dogma of free-will" is "that every one is at liberty to desire or not to desire." Now as to whether this is a just statement of the problem, we will call two witnesses of unimpeachable character—Kant and Hamilton. Kant says "we only mean by liberty that negative property of our thinking frame not to be determined to act by physical excitements."† Still more clearly he says, "The instincts of man's physical nature give birth to obstacles which hinder and impede him in the execution of his duty. They are, in fact, mighty opposing forces which he has to go forth and encounter."‡ Again he speaks of "the force reason has to vanquish and beat down all the appetites which oppose the execution of the law."§ Clearly then Kant allows that we must desire, but says we have power to rein in our desires. Hamilton is just as clear. He speaks of man's liberty as "capable of carrying that Law" of Duty "into effect, in opposition to the solicitations, the impulsions of his material nature."|| A few lines lower he speaks of Liberty as a power "capable of resisting and conquering the counter action of our animal nature."|| Thus Kant and Hamilton admit that we are compelled to desire, but they assert that our free will can restrain desire. Mr. Spencer must therefore stand convicted, either of being ignorant of what they held, or else of a deliberate misrepresentation of the question at issue. On either supposition he stands convicted of glaring misrepresentation.

2. In the next sentence—sentence four—there is a fallacy. Let it be remembered that Mr. Spencer has to *prove* that the will is not free, and he is now advancing arguments which are supposed to prove it. This is his argument. "From the universal law that, other things equal, the cohesion of psychical states is proportionate to the frequency with which

* *Principles of Psychology*, vol. i. pp. 500, 503.

† Kant, *Metaphysic of Ethics*, Calderwood's Ed., p. 174. ‡ *Ibid.* p. 194.

§ *Ibid.* p. 198. || Hamilton, *Lectures on Metaphysics*, vol. i. 4th Ed., p. 29.

they have followed each other in experience, it is an inevitable corollary that all actions whatever must be determined by those psychical connexions which experience has generated." Now what, I ask, is the argument in this sentence save an assumption of the very point at issue?

It is contended, as Mr. Spencer surely knows, by those who hold the Freedom of the Will, that, be the connexion of psychical states what it may, be the organisation what it may, there is still, in every sane man, a power of bearing back the force of the organisation, and of going clean contrary to it. Such assert that there is a *free* element in the Will which makes it unlike to, and higher than, anything elsewhere to be found in the whole domain of consciousness. They declare that the chain of causation which obtains even in the majority of our mental operations, does not obtain in the region of the Will, that it stands solitary and unique—the organ of a free and responsible Personality—surrounded by a universe held in the chains of Law. That is the position taken up by the ablest advocates of Freedom. What argument does Mr. Spencer advance against this position? None whatever; he simply assumes that the will is ruled by the same unvarying law, and has the same definite succession of necessary states as those which obtain in other parts of the universe; which is the very thing advocates of its freedom say it has not. Mr. Spencer, therefore, does not meet the issue; he simply evades it. As we saw in our last Paper, he passed *per saltum* from solar rays to mental energies, so here, by a similar unwarranted leap, he passes from the admitted conformity to Law which marks other parts of our organisation to that unique Freedom and power of choice which resides in the Will alone.

3. In the next sentence but one there is the same unwarranted assumption of the very point in dispute. He calls it "an illusion" to think "that at each moment the *ego* is something more than the aggregate of feelings and ideas, actual and nascent, which then exists!" If this is not confounding the phenomena with the substance in which that phenomena inheres, I am at a loss to understand the meaning of language. "The aggregate of feelings and ideas, actual and nascent," means the various tracts which together cover over the whole area of consciousness—they are the various modifications of the substance of mind. Now does Mr. Spencer, the advocate of Realism, the resolute Iconoclast of all Idealistic theories—does he mean, as he here says, that "the aggregate of feelings and ideas" is all that is in the *ego*? Does he really deny that there is an *ego* distinct from these, a substratum on which they repose." If so, shade of Berkeley!

how thou art avenged, for thy fiercest assailant is now possessed by a double portion of thy spirit. Evidently Mr. Spencer here commits himself to a theory of the wildest Idealism. He denies the existence of all substance of mind, and asserts that there are in us only a fleeting succession of transitory states! Just as well he might deny the existence of all substance of matter, and say that matter is nothing more than a bundle of phenomena. John Stuart Mill asserted this, but hitherto Mr. Spencer has been too wise. He can take up this position if he likes, but he will know the fate which in that case awaits him. Elsewhere he has many times said that mind as distinct from all phenomena of mind is the one existence of whose reality we can be most absolutely certain, "is a truth transcending all others in certainty."* In this sentence, then, are two contradictions. He confounds substance with phenomena, which elsewhere he has carefully distinguished; and he denies, what he has in other places asserted, that mind, as distinguished from its modifications, exists.

4. In the next sentence but one there is the same assumption. There is not one particle more of reasoning. He simply asserts that "the entire group of psychical states which constituted the antecedent of the action also constituted" (the actor) "himself at that moment—constituted his psychical self, that is, as distinguished from his physical self." Now here is a very clever and plausible sophism. We cannot say point blank that Mr. Spencer's statement is false, but as he means it, it is false. "The entire group of psychical states" may be, perhaps, held to make up a man's "psychical self," if within those "psychical states" that power of free-will which rules them all is included. But Mr. Spencer means by "psychical states" simply states of mind held in the bonds of unvarying law, with all freedom of will shut out. Hence his sentence, reasonably true in sound, is false in meaning, and no fresh argument is adduced. It is one more *petitio principii*.

5. In the very next sentence he makes the same round assertion, advancing no fresh argument.

6. In the next sentence he makes a break as if about to go on a new line of departure, and give us something more worthy of his masterly dialectic. But it is only to continue the same logical vice. He says:—"Either the *ego* which is supposed to determine or will the action is present in con-

* *Principles of Psychology*, vol. i. p. 209.

sciousness or it is not. If it is not present in consciousness, it is something of which we are unconscious,—something of whose existence we neither have nor can have any evidence. If it is present in consciousness, then, as it is ever present, it can be at each moment nothing else than the state of consciousness, simple or compound, passing at that moment."

Obviously here is again only assertion, and no proof.

7. In the next sentence he makes the same unsupported assertion, saying, "this composite psychical state which excites the action, is at the same time the *ego* which is said to will the action."

8. The next sentence is very suggestive and self-revealing, but it contains only assertion, and no proof. He continues: "Naturally enough, then, the subject of such psychical changes (it is passing strange how, if these psychical changes are the man himself, as we have so often been told, there can be a *subject* of them—subject is what underlies phenomena, and if there are *only* the phenomena, the subject thereof is only a sort of hypostatized zero) the subject of such psychical changes says that he wills the action, since psychically considered he is at that moment" (the same round assertion as before) "nothing more than the composite state of consciousness by which the action is excited." This seems to me to be on the whole one of the most remarkable sentences in the whole compass of Philosophy. The poor "subject" is made to do duty in many aspects. In the first clause he is a being who alone makes possible all the "psychical changes," for a psychical change cannot take place save in a *psyche*, of which it is a change; in the second clause he is alive and active indeed, but under an illusion in thinking he wills the change; in the next clause he is reduced to "nothing more than the composite state of consciousness" by which the change was effected. Mr. Spencer must be pressed indeed for argument before he could put on paper such hollow reasoning.

9. In the next sentence we have the old assertion, but no proof. "But to say that the performance of the action is therefore the result of his free-will is to say that he determines the cohesion of the psychical states which arouse the action—and as these psychical states constitute himself at that moment"—(asserted and not proved once more) "this is to say that these psychical states determine their own cohesions, which is absurd."

10. In the next sentence he says, "their cohesions" (cohesions of these psychical states) "have been determined by experiences." But this is the very statement which the advocates of Freedom deny. They say that the cohesions made

by the Will are undetermined—that all “experiences” are only votes given in favour of a certain course—and that, be the voting what it may, the Will has a casting vote which can set aside any amount opposed to it, and by its simple decree compel the organisation to act as it pleases. To establish his proposition Mr. Spencer is bound to overthrow this doctrine. As we have seen, he has not advanced one real argument; he has only made assertions. The advocates of Freedom can make counter-assertions, and, for all that Mr. Spencer has contributed, the matter stands where it was.

11. In the next sentence there is the same unsupported statement.

12. The next suggests that what he calls the subjective illusion that our will is free is strengthened by an objective illusion, produced by the extreme complexity of the amounts and directions of the motives that urge it, which complexity is such as to make its action incalculable; and he shows that in proportion as material masses are acted upon by many forces do they move in a line which cannot be predicted, and hence they seem to be free. Any trained scientific intellect will, I think, see the worthlessness of this argument. Every mathematician will say in a moment that if a million forces be acting on a body, it will obey the resultant of them all,—and that between this and freedom there is a difference as wide as logical contradictories can make it.

No doubt the flight of a bird through the air seems to be free; but it seems so only to the untrained intelligence, and anyone accustomed to the severities of scientific thought sees quite clearly that every movement of its wings is held in the bonds of fixed law as completely as a planet is held in its place in the heavens. Mr. Spencer's is only an *ad captandum* argument; the illusion would impose on no student of science.

13. Mr. Spencer then makes one final effort—a sort of closing charge, intended to sweep all opponents from the field. He brings out one of his great generalisations, which are, as a rule, so far-reaching in their range and so penetrating and deadly in their sweep. Here, however, his artillery is loaded only with blank cartridge; there is a great appearance, but no force. He says, “To reduce the general question to its simplest form, Psychical changes either conform to law, or they do not. If they do not conform to law, this work, in common with all works on the subject, is sheer nonsense; no science of Psychology is possible. If they do conform to law, there cannot be any such thing as free-will.”

This last sentence seems to show in what way Mr. Spencer

is misled. He evidently thinks that conforming to law makes free-will impossible. He has that inveterate materialistic bias, often engendered by scientific pursuits, which can only regard "law" as applying to material things—to masses or molecules—and it must have been evident that all through his Theory of the Will he has been thinking only of the currents of nerve-molecules, and has never had in clear vision the immaterial mind which rides upon them. Thinking only of molecules he cannot see how they can be free; he is compelled, whilst he is in this materialistic vein, to regard the whole man as all made up out of them, and all contained within them; hence he is driven to make these molecules the determining power of each action, and to ignore altogether that immaterial Mind in the man whose existence is one of the structural doctrines of his Philosophy. This Mind may conform to law and yet be free:—the Will, which is one aspect of the Mind, may determine, within certain defined limits, along what lines the molecules shall go; it may make and carry out its decrees as it chooses; it may be free, and yet all the psychical changes will conform to law, a law the Will imposes.

It is easy to prove that there can be no contradiction between conforming to law and freedom. We can form the conception of an agent who is free, and is at the same time morally perfect. No one surely will contend that these are logical contradictories which cannot be combined in one concept (the illustration would hold if we regarded him as diabolically perfect); now this agent is by hypothesis free, and yet it is certain that his very perfection would lead him, with absolute precision, along the lines of that law which laid down the path of moral perfectness. His organisation being perfect would urge him along that path, his will being perfect and free would deliberately approve of the suggestions of the organisation, would accept them, and carry them out.

If we take up for a moment the Theistic position, the point can be more conclusively proved. Let us ask, "Is God free?" If not, then He also is bound in the same miserable chain of Fatalism. If He is free, yet when He gives fullest play to His energies is He not most completely conforming to law—the law of His own holy nature. If, then, the Creator can be free and also conform to law, the combination of the two concepts in one concrete instance is proved to be possible. Why, then, should it not be possible to the creature also? Made in the image of God, is it not probable that some of the Divine Freedom would be given to us? As we seek to train our children to be good and holy by setting them free in due

time from the restraints of law, seeking to educate in them a righteous principle which shall make them rule themselves wisely and well, and as we know that their attainment of this principle is worth all the possible slips and mischances they may make in gaining it, so the Divine Father may see that the true valour of righteousness can only be acquired by setting our spirits free, He may see that the advantages so secured far outweigh the disadvantages; He may recoil from having His Throne surrounded by a band of slaves who never had any choice as to whom they would serve; He may prefer the loyalty of free men; and to secure this He may launch out each human spirit on the ocean of life,—supplying abundance of charts and guides,—but casting on each the solemn responsibility of deciding to what port he will steer, what character he will have, what he will regard as the supreme good of his being. For God so to act is to make Life one grand moral test, and; so far we can judge, it is a course eminently worthy of the God of Righteousness.

It must now have been made evident that all through Mr. Spencer's reasoning on the subject of the Will he has got into a shallow vein, and never gets down to the depths which are found in other places of his philosophy. He seems here to have yielded himself to a preconceived notion, to have allowed that notion to rule the entire structure of his thought, and to have laid aside that habit of careful, dispassionate scrutiny which has, for the most part, characterised him. It is difficult to account on any other hypothesis for the utterly superficial character of the thought and argument he has here presented. If we formed our notion of his Philosophy from these few pages, what could we deem him but the very chief of empiricists? What can we gather from these but that our consciousness of Personality is a delusion,—that our *ego* is only a bundle of feelings and ideas,—that mind is only an aspect of matter,—that the logical laws are only registered sensations,—that consciousness is untrustworthy,—that matter is only phenomena,—that there is no rock of truth anywhere,—that we can be certain of nothing,—that we cannot be certain whether we can be certain of nothing,—that the whole universe is a quaking body where appearance is mixed with reality, and it is quite impossible to tell whether there is anything of either? That is the sorry stuff which may fairly be gathered from these unworthy pages. A more thorough-going contradiction to the doctrines which Mr. Spencer has elsewhere, over and over again, proclaimed to be structural and fundamental principles of his Philosophy, it is not easy to conceive. Then this mere surface of argument, which is just

like the strange *ego* he has conjured up,—the mere phenomena of thought without one particle of reality behind it,—this poor word-painting, utterly unbecoming a great philosopher, he attempts to keep in countenance by an illustration just as shallow, just as evasive of the point at issue, just as much a piece of mere paint as all that has gone before. No doubt those have something on their side who affirm that Mr. Spencer's whole system is an empiricism. It must be allowed that he has some clay mixed with his iron and his gold. His system is not homogeneous. Still, as Homer sometimes nods, I, for myself, prefer to appeal from Mr. Spencer, seemingly prejudiced, and certainly shallow and inconsistent, to his own deeper and grander self, and to hold that that is the true philosopher who has led us to found on the solid rock of truth, who has proclaimed that the evidence of consciousness transcends all other evidences, that the existence of mind is one of the most certain of truths. It is his masterly demonstration of these important principles which gives him a claim to our reverence and gratitude, and for the sake of these we can pass by his failing here. But the complete failure of a logician of his grasp to render a worthy reason suggests a very decided inference that the truth in the matter is altogether against him, and that even he is not powerful enough to bear back the overwhelming strength which that truth possesses.

In showing, then, that Mr. Spencer has not proved the bondage of the Will we have made another great chasm in his Philosophical system hardly less important than the chasm shown in the former paper to exist. Then it was proved, on Mr. Spencer's own showing, that although he allowed Mind and Matter to be at opposite poles of the universe, having between them a logical chasm which no effort of ours could span, he yet did attempt to pass logically from solar rays to mental operations, and that his whole system fell in utter chaos if this step was impossible. As it was impossible, it was in this way shown that all the Mind in the universe remained, on his system, quite unaccounted for, and that this omission made a yawning gap he could never fill up. We have shown in the present Paper that there is a similar hiatus when he attempts to pass from Intellect to Will. The continuity of his system depends on his showing that Intellect can pass into Will. If the reasoning of the present Paper be just, he has advanced nothing to show this. All the Will in the universe, then, remains on his system unaccounted for. In the next Paper I hope to show that his system is equally destitute of any trace of Conscience. "A System of Philosophy,"—an explanation of all that is in the universe,—which does not account for any

of the Mind, any of the Will, any of the Conscience, and yet claims to account for everything, must speedily lose its hold on intelligent men.

And it seems to me that he has gone a long way, quite unintentionally of course, towards showing that the Will is free. As parts of his Philosophy form our most invulnerable defence against the attacks of Materialists and Idealists, so it may be that he has also supplied some of the most solid arguments for the Freedom of the Will. We have been assured by him that Mind and Matter are at the two opposite poles of being. They are x and y , two existences having no factors in common; no one thing being found in the one which is also found in the other. I understand his rhetoric to mean or to imply that they are logical contradictories, whatever the one has that the other has not. They form a perfect series of antitheses, and if they are at the opposite poles of being, as he says, I do not see how this conclusion can be avoided. If they have any one element in common, there surely they can unite, and that element makes a bridge over the mighty chasm that divides them. But Mr. Spencer says no such bridge is possible; they are the Jews and Samaritans of the philosophical world, eschewing all intercourse with each other.

Now if this conception be just, as it seems to me it is, surely it must be true that whatever is found in the one will not be found in the other. And beyond all question fixed causation does obtain in the world of Matter. Everything there is held in the iron grip of law. Thus it seems to me that such fixed causation cannot obtain in the realm of Mind, but that, as the logical contradictory of the law obtaining in Matter, the opposite rule, of Freedom, must obtain in the realm of Mind.

It can readily be ascertained whether Mind and Matter are logical contradictories in all other things. Certainly they seem to be. Matter is extended; Mind is unextended. Matter is unintelligent; Mind is intelligent; Matter has space relations and has weight; Mind has no space relations and has no weight. Matter is capable of motion or of transit in space; Mind, having no space relations, is incapable of motion. It seems to me the antitheses might go on *ad infinitum*. If, then, in every other conceivable category of thought Mind were the proved antithesis of Matter, that doctrine would have but a very precarious hold on a strong intelligence which asserted that in this one instance, viz., of bondage to fixed law, Mind and Matter were alike. One frail spider's web spanning the almost infinite chasm between Matter and

Mind—the frowning cliffs rising high on each side, needing the vision of an archangel to survey them, confronting each other in solemn isolation, and this one frail link alone binding them! the idea well-nigh becomes incredible. If separated, as Mr. Spencer assures us, they are completely separated, they must be logical contradictories with no bond of union.

This Philosophical Doctrine of the Freedom of the Will does not seem to me to be defended by the upholders of Revelation and of the Moral Law with anything approaching the zeal and fidelity that the magnitude of the matter demands. Kant may be said to have put forth the undivided energy of his keen and powerful intellect in order to establish the thesis of the Freedom or Autocracy of man's will, and to show that the whole Moral Law must stand or fall with it. He in effect binds up the two doctrines into one, and not unfrequently makes them synonymous. Thus he says, "We have now reduced the Idea of Morality to that of Freedom of Will."* Again, he says, "Autonomy of Will is the alone foundation of Morality."† and many other distinct statements, as well as the whole structure of the "*Metaphysic of Ethics*," go to show that, in his judgment, to deny Freedom to the Will was to make the idea of Morality impossible. He seems to me—and it is a growing opinion in our day—to have been one of those rare prophetic minds, ranking amongst the great men of all time who stand forth as the champions of eternal truth, whose glance sweeps down the centuries, and whose judgments express the thought of the All-wise God. Doubtless in his critical Philosophy Kant was mainly destructive, but in those of his works which are thrown up as bulwarks of the Moral Law, he seems to me to display a penetration and a power far beyond any mind of later times. No modest man can, I think, pit his judgment against Kant. Hamilton followed in his footsteps largely as his disciple, and he makes the same impressive declaration that Moral Liberty and Moral Obligation must stand or fall together. He says, "Virtue involves Liberty;"‡ he says, "The possibility of Morality depends on the possibility of Liberty; for if man be not a free agent he is not the author of his actions, and has, therefore, no responsibility,—no moral personality at all."§ In addition to these solemn and weighty statements it is clear that he determined to found his whole metaphysical system on the moral canons,

* *Metaphysic of Ethics*, Calderwood's Ed., p. 59.

† *Ibid.* p. 99.

‡ Hamilton, *Lectures on Metaphysics*, vol. i. p. 27, 4th Ed.

§ *Ibid.* p. 33.

and that notable and noble parts of it are chiefly intellectual buttresses, thrown up to keep safe and intact the outworks of the Moral Law. He has examined all the intellectual antinomies, which Kant raised, but never solved,—he has combined them all in one conception, magnificent in its sweep, startling in its originality—the “Law of the Conditioned”—and any one who accepts that Law has provided for him a fortress of incalculable strength, within which the doctrines of moral liberty and moral obligation may be defended against all assailants. John Stuart Mill attacked that “Law of the Conditioned” in what may honestly be described as a ferocious style, for he saw how invincible it made the Theistic position; but his poor little sophisms are now treated with the contempt they deserve. Mr. Spencer can be shown to have accepted as valid the main arguments which lead up to the “Law of the Conditioned,” and it needs nothing more than a slight resetting of the Hamiltonian thesis in order to make it invincible against all attacks.

Kant and Hamilton are by this time almost proved to be of the prophetic order of men, for what they asserted to be a logical necessity has now actually come to pass. We just saw that they declared moral Liberty and moral obligation to be indissolubly united, and that the denial to man of Liberty must lead to the denial to him of moral obligation. Mr. Spencer’s whole Philosophy is a startling commentary on this thesis; he denies Liberty to man, and there is in his system no trace of moral obligation. He has lately proclaimed that the “sense of duty or moral obligation is transitory,”* and that as civilisation progresses, man’s nature will become more perfectly co-ordinated, needing no moral directions. No one who watches the currents of thought in our day which deny to man Freedom of Will can question that denial of moral obligation accompanies them to no small extent. The advocates of Determinism and Automatism can see instinctively that our moral instincts are opposed to them, and that if these instincts remain in full force their theories cannot prevail; as the doctrine of their school sinks into Materialism, its antagonism to all moral principle, all sense of right, all authority of conscience is at once more constant and more vehement; and in the lowest stages it reaches a point where man is made to be only a helpless mechanism, all future retribution is derided as an old world dream, and the worst impulses of his sensual nature are unblushingly defended. Thus, surveying the matter along the

* Spencer, *Data of Ethics*, p. 127.

whole line, from the noble utterances of men like Kant, to the refined yet negative morality of Mr. Spencer, and still on to men infinitely beneath him, mere human animals, who glory in their shame, the same truth meets us, that the denial to man of moral Liberty—of perfect freedom to choose or reject either good or evil—leads, of necessity, to the denial to him of moral obligation. Put upon him at once the honour and the responsibility given him by his Creator; then he must live like an immortal being, or be condemned by his conscience if he does not. Take from him this crown, he soon descends, and, in inferior natures, begins to wallow without blushing in the mire.

It may be well to remark that the Philosophical doctrine of the Freedom of the Will by no means necessitates that heresy of Pelagianism, branded as false by the Universal Church, which teaches that man, by his own inherent strength of Will, without the aid of Divine grace, can arise and work out his own salvation. No man was more diametrically opposed to this heresy than Augustine, no man was its more uncompromising antagonist, yet he himself held the Philosophical Doctrine of the Freedom of the Will. He says: "For who is there of us would say that by the sin of the first man free-will is utterly perished from mankind?"* Archbishop Usher, again, was one of the staunchest upholders of the need man has of converting and renewing grace, yet he was a resolute champion of the Freedom of the Will. He says: "Freedom of Will we know doth as essentially belong unto a man as reason itself; and he that spoileth him of that power doth in effect make him a very beast."† We may hold that men are morally free, that they are the fashioners of their own moral character and the arbiters of their own destiny, and yet have the most profound sense that until a power comes into them from above, and supplements their feeble efforts by the flood-tide of a Divine energy, they never can arise and work out a righteous character. Where to draw the exact line between the Divine and the human working it may be hard to say, and, as it is of no practical importance, perhaps it is not well to attempt it. It is sufficient that we remain within the broad lines upon which the Church Universal is practically unanimous, of the absolute need of the entrance into man of a Divine Spirit, who can refine and purify his Will, cleanse it from all earthly defilement, and lift it high into the regions of

* *Quis autem nostrum dicat, quod priori hominis peccato perierit liberum arbitrium de humano genere?* Cont. Pelag. lib. i. cap. 2.

† Usher, *Answer to a Jesuit on Free Will*, 445 (Cambridge Ed. 1835).

God's holiness, where it can still stretch onward to the moral infinity that then comes into view. This doctrine of the helplessness of man, and his need of Divine grace, by no means conflicts with the doctrine of the Freedom of his Will. Some of the Scotch theologians have, I think, confounded unjustly man's need of grace with the doctrines of philosophical necessity. To my mind the two are in entirely different regions. Man is free to take his own course, but, if he proudly rejects the help God offers him, he will find that all schemes of his own are unavailing, and that his weak arm cannot bear back the forces which urge him in a downward direction.

Let us, then understand that in this question of the Freedom or the reverse of the Will we are dealing with a matter of the greatest moral moment. If the will be free, then the moral nature of man at once comes into prominence; the conscience is seen to be seated on the throne; the awful moral sanctities are clearly revealed; the infinity of all questions connected with righteousness is made evident; the horizon which bounds our existence recedes before us, and we find ourselves placed as actors on the vast stage of the universe, furnished with helps and guides, but bidden to choose our own destiny, to take upon ourselves the solemn burdens of existence, and to say whether our path through life shall be, first, the battle-field of a hero, then the exultation of a conqueror, then the aspirations and holiness of a saint, and shall finally carry us throned and triumphant to our coronation amidst the saints of God; or whether that life-path shall be a misuse of opportunities, a despising of offered help, a mocking at the restraints of law, an intellectual selfishness, a gradual debasement, a final sinking into crimes for which no name can be found. Upwards or downwards man must go, and there seems an infinity in both directions. It behoves us all to choose the upward and happier path, knowing that we are quickly advancing to the last tribunal, where the secret action of every Will will be laid open, and all will be tried by just and universal Law.

The CHAIRMAN (Rev. Preb. Row, M.A.).—On the part of the meeting I have now to propose a vote of thanks to the author of this paper, a vote which I feel sure we shall all very cordially tender for the extremely clear, distinct, and effective manner in which he has met the entire question. (Hear.) Before sitting down I wish to make a few remarks, as I shall not be able to remain until the end of the meeting, this being the first evening during the last two years upon which I have ventured out of doors. I think the paper throughout is exceedingly clear, and that it has ably met the position assumed by Mr. Herbert Spencer. One thing which

greatly surprises me is, that books like those of Mr. Spencer—so utterly contradictory to common sense, and to the very first intuitions of our nature—should have obtained the wide circulation which they have among a large circle, including many of the most powerful minds of our age. I have no hesitation in saying that the subject handled in this paper is the very central one of the present system of practical atheism. The great and all-important controversy at the present day centres around the efforts which a number of powerful intellects are making to confound between the material and the moral; and, if it could possibly be established that this confusion does exist, and that the material dominates, from one end of God's universe to the other, then the paper abundantly shows that there is an end of all morality; for unless the innermost intuitions of the mind are true when they tell us that if we are not free to do this or that, we can have no possible responsibility for the acts we do. (Hear.) It comes, therefore, to this, that the controversy lies very much within the limits of common sense. To tell me that for the evil I do I am not responsible, is in reality asking me not to see that gaslight now before me, when I am seeing it as plainly as possible. What gives a degree of plausibility to these speculations is the frequent use of a great number of hard words: the tendency to do this runs throughout the works of the whole of this class of writers. The number of these hard words is so great that I find my own intellect somewhat confused when endeavouring to read them, and I think that if the authors I refer to would only write in plainer English, their systems would very soon be absolutely exploded. When we are asked to believe that our personality is nothing but a mere succession of feelings, what is it that we are asked to accept? Why, something which entirely contradicts the whole testimony of the human race from the moment man appeared as man, to the present hour. Those who maintain this view cannot express themselves in language without distinctly denying the theories they expound. This shows that there is something singularly absurd in the position they take. We have no certitude more certain than the permanency of the *ego*. To suppose that the whole experience of man from the commencement, both objectively and subjectively, is based on a simple delusion, would denote an amount of credulity exceeding anything that I can possibly conceive. But this is the result of the theories in question, notwithstanding the great names attached to them, that if they are accepted by the large body of mankind they will certainly end in subverting all sense of human responsibility. Evil then becomes merely a man's misfortune, not his sin; and crime, insanity; and the result will be that the sane portion of mankind will have to build a large number of asylums in which to place one half of their fellows, so as to save themselves from possible dangers. There is only one other point upon which I would touch—I am bound to say that I cannot agree with the position which has been laid down to the effect that we can be philosophically free and at the same time theologically bound by necessity. I think that the position is hopelessly unmaintainable, that

a thing can be theologically true, and philosophically false, or the converse. I do not care for any abstract theories. I say freedom is a fact—one of which we are directly conscious, and therefore one of our highest certitudes ; and therefore, I hold, it is a great error to say we can be philosophically free in one sense and theologically not so in another ; and although some great names may be mentioned in support of the proposition, my reply is that I do not care whose doctrine it is, it is certainly not the doctrine either of reason or of the New Testament. (Applause.)

Rev. J. FISHER, D.D.—According to the paper, at page 13, we are told that “mind and matter are at the two opposite poles of being” ; but that the author only means that they are objective and subjective sides of the same substance ; at any rate, it comes to that in the end. Two pages further on he says that Mr. Spencer denies liberty to man, and asserts that moral law must fade away out of the earth, and man will need no moral directions. In that case, of course, we must have the golden age.

The CHAIRMAN.—This is assumed in his last work.

Dr. FISHER.—On the fourth page Mr. Spencer is quoted as saying,—“that the *ego* is something more than the aggregate of feelings and ideas” is an “illusion,” and in the next sentence he speaks of man as subject to “psychical states !” On the next page we find Mr. Spencer quoted as speaking on the subject of “psychical changes” ; but surely if man, the *ego*, and the psychical states and changes, be the same things, where is the subject ? There is none. Mr. Spencer writes thus confusedly because he is a monist, using the language of a dualist. Monism cannot construct a language for itself. As regards freedom of the will, natural freedom is a ground of responsibility, and grace does not interfere with it. The will is the power of mind by which we choose aright ; but the exercise of the will is from the heart, and, as the heart. Will is the medium of active power, and operates according to the nature of the agent, and the nature of the agent is the source of power. What is needed to a good choice is an influence from God in the heart. A self determining will is an absurdity, for if the will move itself it is both cause and effect. Motive determines the will. The motive determining the will has a place in the understanding, and it is through the understanding, which is the key to the heart, that the will is moved.

Rev. Preb. IRONS, D.D.—I think the paper which has just been read is a very important one, and it is none the less so for the statement it contains, that this is *the* question of the age, and one which we as Christians have not, as yet, sufficiently attended to. (Hear.) There is no doubt that St. Augustine contributed to the stream of Christian thought, and it has scarcely settled down into a clear and healthy condition from his day to ours. There is truth in the statement of the essayist, that the Scotch philosophers, who have a great deal to answer for in the matter, were so much afraid of the doctrine of free will, that they absolutely practically denied it in the whole region, both of ethics and religion. I wholly deny that the grace which comes from God to

assist the efforts of imperfect man, at all destroys human will. (Hear.) That it interferes with it I will admit, in some sense, as a matter of course. Why, otherwise, should it come at all? But if it gives a man clearer knowledge, stronger powers, higher aspirations, that man is responsible for all he has so acquired. The doctrine of responsibility is grounded in our sense of retribution for all wrong that is done. I will grant very freely with all thankfulness to God, that in connexion with this doctrine of retribution, there is a sense that mediation between us and the judgment that is due to us is quite possible. A man does a wrong thing and fears the wrong he has done, but, at the same time, no man has put himself in this position without also having the feeling, that in some way or other some one will interfere. This interference we have, as Christians, in the mediation of Christ. However, leaving this question of Calvinism and freedom of will and sense of retribution, and hope of mediation and intervention, I should like to go back for one moment to the beginning of the paper, and I promise that I will not detain you more than a minute or two. It is a matter of common sense that the *ego* precedes every action of every kind performed by a human being. Action is not possible until there is an *ego* to act; and here we see the very blunder which pervades Mr. Herbert Spencer's philosophy. One is astounded to find that the same blunder has penetrated the whole of the materialistic mind of our age. They leave out the thought of this *ego*, which we are very properly told by Mr. Spencer goes before the action. But he afterwards tells us this *ego* is the result, or is identical with the circumstances in which we find ourselves—the feelings which arise within us. He quite forgets that if there are feelings there must be an *ego* to feel. Whose feelings are they? They are the feelings of the *ego*—of the man. And this leads me to object in the strongest way to the manner in which Mr. Herbert Spencer, and almost all of us, are in the habit of using popular abstract terms as though they were entities. Men say they are moved by motives. I may contemplate a certain thing and may consider it; but the motive does not move me. It is I who move in the whole matter. Men speak of their having a memory. I have not one. I am thankful to say, I remember. (Hear, hear.) I have legs, but I should not say they consist of walking and running: the walking and running are actions of the limbs set in motion by the *ego*. In every way we are injuring ourselves by abstract ideas. I do not deny that they are of great usefulness; as Berkeley pointed out, as instruments of thought they are absolutely necessary. Some of them are but collective terms. When we speak of a man, we use a word which is a general term, to describe what we mean, whether a white, a red, or a black man. It is a general term to describe the object we have in view. Every one knows what I mean in a general way, if I say, "as I came to this room to-night I met a man." You would not say I was speaking incorrectly if I did not describe how tall he was, nor how he was dressed, nor what nation he was of, whether, for instance, he was a Frenchman or a Dutchman. These general abstract terms are both useful and necessary for the common purposes of the language. There is also

a higher type of abstract words, and it is needless to pretend that these abstract ideas are entities existing apart from us, when they are the descriptions of those actions which we ourselves perform, and not our wills, our memories, or our reflections. *I will ; I remember ; I reflect ;* but do not tell me that I use my memory ; that makes a third party. I am not conscious of anything of the kind, nor do I believe that anybody in this room is. I know that some gentlemen, and, I may say, some ladies, have very strong wills. (Laughter.) But that means simply that they can will very strongly, and no one can mix in the society of either sex without finding that the individual can will. But to take it for granted that he has something in addition to himself which does the business of willing, is to me wholly unphilosophical ; and this, to my mind, is the prevailing blunder of Mr. Herbert Spencer, *et hoc genus omne*. (Applause.)

The CHAIRMAN.—There is no doubt that much confusion is caused by people saying that by freedom of will it is meant that a human being can do anything he pleases. I will only say in reference to what has been said by Dr. Irons, the great Truth was known in the days of Abraham, “ Shall not the judge of all the earth do right ? ”

Professor O'DELL.—I fully appreciate the manner in which Mr. Ground has, throughout his paper, kept to the subject under discussion, and kept clear of theological matter. Mr. Herbert Spencer has challenged us in regard to the question of the will, and on reading his works, the conclusion I have come to from time to time is that his statements are very much opposed to our universal experience, especially in regard to the subject before us to-night. If we appeal to our experience concerning the will, I think we shall be able to obtain more truthful information than we can derive from what has been written by Mr. Herbert Spencer. In considering the question, “ Is the will free ? ” let us ask ourselves—can we go to the right or to the left ? Can we live or die ? I can do any or either of these things. I can, if I choose to do so, act in opposition to my own intelligence, which tells me certain things, and that one course is wise and another foolish. We all know that we can go directly contrary to that which we believe to be right, and we know also that highly intelligent and cultured men have acted in opposition to their own reason. There have been men who have been educated in the highest colleges, who have acted in the basest manner, thus showing that they had wills which could deprave them to the lowest depths in direct negation of all the culture they had received. On the other hand, we are also aware that there have been men reared in the lowest haunts of vice and misery, who have shown their freedom of will in an entirely different direction. Quite independently of the teaching they have had, they have exercised their wills in opposition to all evil influences. Again, we have the fact that there are men who will not allow their wills to be bound by laws, as Mr. Herbert Spencer must at least acknowledge,—men who refuse to obey the laws of their country, laws the breaking of which brings immediate punishment upon

them, and in doing this they act in opposition to their judgment and to every good influence brought to bear upon them. Moreover, I would say it is not only in opposition to reason and reflection, and to the laws of the country, and without any sufficient inducement; but men are also known to assert their wills in opposition to the laws of God, which they acknowledge and believe to be right and true. Men having full belief in the pains and rewards of eternity, have, nevertheless, gone in entire opposition to that belief, thereby proving that, universally, the will is absolutely free. (Hear.) Mr. Herbert Spencer is spoken of as a man of philosophic grasp and of clear scientific conception. All I wish to say is this, that if I were to take Mr. Herbert Spencer's assertions as entitled to my fullest credence, I could not believe in Christianity—in other words, I hold that it requires more faith to believe in Mr. Herbert Spencer, than to believe in Christianity.

Mr. W. GRIFFITH.—I think we are very much indebted to the author of the paper for having proved false or erroneous some of the arguments of Mr. Herbert Spencer. We need not refer to the Spencerian theory to understand the necessitarian view. Whoever will look into the works of Hume and Priestley will fully understand that line of thought. They asserted that the connexion between motive and action is similar to that of cause and effect in physics; that human actions are the result, not of choice, and that they are the sequences of physical causes, not the consequences of deliberate reason. Even those who in theory contend for the doctrine of necessity, in practice ignore it. Was Mr. Herbert Spencer a mere automaton when reading previous philosophical authors? Did he exercise no deliberation when he composed his essays? And when he had selected a publisher to print and circulate his opinions, were each and all of these processes the mere result of a fortuitous concurrence of material atoms?

If we rightly define the word law, we shall be able to understand all the fallacies which pervade the arguments of Mr. Spencer, and which have been refuted by the author of this paper. Then it will not be requisite to follow those arguments *seriatim*. How do we define what we mean by the word "law"? Is it a mere sequence of effect? Is that a true proposition? Surely not. There are laws physical and laws moral. The former must take effect; the latter ought to be obeyed. The latter, when defined according to the nature of things, suppose disobedience possible, and postulate the freedom of the will. Most sound writers on morals and jurisprudence will tell you that law is the expression of the will of the law-giver enforced, by some sanction, upon the moral being. If you once admit this definition of law the whole scheme of Spencer falls to the ground, and needs no further exertion to destroy it. But destruction is not construction. It is easy to criticise and find fault with anything; but we ought to consider what shall we substitute in its place.

We have to establish, as a matter of fact, that the will is free. The mere destruction of Mr. Spencer's theory by Mr. Ground hardly establishes the positive side of the question. Dr. Irons appealed

with great force to the feelings of the human mind, and, undoubtedly, there is a great deal in what he said. That is one argument in support of freedom of the will. But there are others. We may say, for instance, that every language proceeds on the supposition of the freedom of the will. How do you explain those words in the English language which are used to signify determination, choice, or judgment, without supposing freedom of choice and ability to judge and determine? And if we turn to other languages we shall find that it is the same in the French, German, Greek, or Hebrew, as it is with us. In fact, the whole consensus of States and peoples, who have and do use language, supports the conclusion that language supposes freedom of will. Again, to appeal to other facts—I do not wish to enter on the theological arguments founded upon prayer and praying to the Supreme Being, because we are discussing the more scientific aspect of the question, and it is well to lay aside for a moment the theological—but, when we wish to influence an angry man, do we not entreat him? When a father wishes to persuade his child, does he not use the arguments of persuasion, and does he not, in following such a course, presuppose freedom of will in the child he seeks to persuade? Again, in politics also, what do we mean by a petition or prayer to Parliament? Is not that a process intended to influence the intelligence of the representatives of the nation? And what is meant by sending those representatives to Parliament, but that they are to exercise their intelligence and their wills for the benefit of the nation?

Mr. Herbert Spencer has advanced somewhat beyond Mr. Hume and Mr. Priestley. He has, with great plausibility, told us that there are certain nerve currents, and that these are evidenced in what he calls nervous energy and force. This is perfectly true: there is, doubtless, such a thing as nervous energy, and such a thing as force, which are exhibited in the raising of the hand, the movement of the foot, or in any action of the body. In all this he has surpassed Hume and Priestley, but after all he has not established anything as to this nervous energy which Dr. Carpenter and other physiologists had not taught. (Hear, hear.) To support his other and more dangerous tenets he has appealed in terms of some eloquence to the consciousness of each individual. But individuals differ and disagree. Whose consciousness shall we take? Our own is preferable to that of another man's, especially when, like Mr. Spencer, he lowers us in the scale of moral beings. But the question being as to the nature of men in general, must be determined by the voice of preponderating testimony. But how, it may be asked, are the suffrages to be collected? In every civilised nation the induction has been already made, the suffrages taken; the case has been tried, and the decision is on record; the verdict has been given without reference to the controversy in dispute.

What, let me ask, is the object of Parliament in making a law? What is in the mind of the Legislature when it passes a law for the benefit of the nation at large? Does it not forbid, condemn, and impose a punishment for

the transgression of that law, on the supposition that men and women, as a rule, individually possess self-control and the power of choosing the good and rejecting the evil? Being a practising barrister, I know, we all know what is frequently put forward as the defence of those who have broken the law. When a criminal is put on his trial for a particular offence, how often does he plead that he has committed it by accident or mistake or unintentionally,—that he had no guilty mind. And the defence of accident is admitted. For instance, if a person, while defending his house against a robber, shoots his own servant when he intends to shoot the burglar, he is held not to be guilty of murder. He exercises his will in shooting, but there is no vice in what he does. In doing what he had a legal right to do he has unwittingly done what he did not mean to do. There is a defect in the use of the will. Then, if you take the case of an infant; he may be put on his trial, but unless the understanding has been developed, “he,” says the law, “ought to be, as a matter of course, acquitted; because he is not held to be responsible until he has reached years of discretion.” Again, take the case of a lunatic; he is acquitted on its being shown that there is a defect of the understanding, and that he is not able rightly to exercise the will. It is there held that there is no moral, or at least no legal, vice in the will. All these instances go to prove that the administration of the law proceeds on the supposition that there is freedom of the will, and that the accused is punishable for its improper exercise. Again, we must recollect that this is not merely the state of the law in England. The French laws proceed on the same line; so also do those of Germany and other European states. In fact, the testimony of the whole civilised world shows that the freedom of the will is looked upon as essential to guilt, and no one is punished unless that freedom exists. I will but mention the testimony of conscience, and the evidence derived from that. If we look to ourselves and remember what have been our own failings in the past experiences of our lives, we shall, as individuals, admit at once that we have had freedom to choose the right and avoid the wrong. Passing to the second part of the subject, I must say that to some extent I agree with Dr. Irons in his criticisms on the statements that have been made respecting the theological and moral view of freedom of will. I think it has been conclusively proved, not only that the theory of Mr. Herbert Spencer is unstable, but also, as a matter of fact, that freedom of will does exist, although it is true that great writers, such as Augustine, have taken up the theological question, and have somewhat obscured the doctrines of Christianity thereby. But Augustine was not consistent. I think Mr. Ground is correct in saying that Augustine asked how can there be guilt if there is no freedom of the will? But at another period of his life he wrote as if he looked on grace as irresistible, and held that freedom of the will did not exist. But the question is, What is Christianity? and not, What were the views of St. Augustine? We can recur to the original record, and we find St. Paul asserts not only the supremacy of Divine grace, but also the freedom of the

will. He tells us in the Epistle to the Philippians, ii. 12 and 13, that we are to "work out our own salvation," and at the same time he says:—"It is God which worketh in you, both to will and to do of His good pleasure." This single text illustrates in a remarkable way the complex problem that may be raised as to the operations of the grace of God and the freedom of the will at the same time. (Applause.)

MR. J. ENMORE JONES.—It seems to me that Mr. Herbert Spencer has in his mind only two facts—psychical and physical,—and that his argument is grounded simply on these, which, in theological terms, we call the soul and the body. He seems to have lost sight of one other element. Most, if not all of us are often conscious of impulses and strength not our own, and we come as Christians to the contemplation of the three great powers we are told of by the Apostle—body, soul, and spirit,—it appears to me that this third power is a power which is not recognised by Mr. Herbert Spencer. I think that if this power were better defined, we should get rid of a great deal of the difficulty which has hitherto helped to obscure the matter. I have referred to this fact, so as to point out what I think has been very much overlooked, namely, that this power which we call spirit, has been especially created in us by the Deity and connected with the two other powers—the soul and body. The soul is, as Mr. Herbert Spencer says, attached to the body, and intermingles and works with it in a mysterious way; but I say that these two are acted upon so as to produce visible effect, by the spirit, which Mr. Herbert Spencer has not alluded to.

REV. F. N. OXENHAM.—I suppose it will be admitted that in examining any philosophical problem, if we are in search of the truth, we ought not to allow any weight to supposed consequences. I mean that we should not permit ourselves to be at all influenced towards rejecting or towards accepting any theory, because it involves, or appears to involve, some consequence which we object to, or which we welcome. This, I suppose, we should all admit as a general rule. But, on the other hand, if a theory is put before us which obviously carries with it the negation of any well-known and indisputable truth, then we are justified in saying, "inasmuch as this theory necessarily involves the denial of what we know to be true, we do not care any further to inquire into it. It contradicts what is certainly true, and therefore it must be false." Consequently, when we come across a theory which is admitted to be contradicted by the evidence, not of one language only, but of all languages, by the accordant evidence of all mankind in every country and of every age, by the establishment of every civilised government ever known (for all governments are constructed on the theory that man is a responsible being, and *can* do, or abstain from doing such things as are enjoined, or forbidden: the belief that this is so is evidenced by every law that was ever made),—when, I say, we come across a theory thus irreconcilably at variance with the universal testimony of mankind, we cannot justly be accused of prejudice if we put it aside, saying that we do not care to inquire into it. It is obviously false, being at variance

with an undenied and undeniable truth. Now it seems to me that the tendency of Mr. Herbert Spencer's argument is not to disprove the freedom of the will, but simply to ignore that there is such a thing as will at all. He is really arguing for the thesis, that our *desires* are not free: and in showing this, he appears to think that he has shown that our *will* is not free. Our desires, he asserts, are the joint result of impulses over which we have little or no command. He brings much evidence to show the truth of this thesis, which we have no desire to question; and then, having proved this, he imagines that he has disposed of what he calls "the dogma of free will." "*The real proposition*," he says, "*involved in the dogma of free will is, that every one is at liberty to desire or not to desire.*" This is a complete misconception. The question is not whether we are free to desire or not to desire, but whether we are free to follow our desires or not to follow them. Mr. Spencer's assumption that will is nothing more than the result of those forces which produce natural desire, is an assumption not only without evidence to support it, but in the teeth of evidence which denies it. I cannot *desire* to be hanged, or shot, or suffocated, or to undergo any great pain; but I can *will*, I can *choose* to undergo any of these things. My desire to do a thing or not to do it, may be, I admit, simply an effort of nature beyond my control, the result of the joint action of various involuntary impulses, as Mr. Herbert Spencer has very clearly defined it. We do not quarrel with him for saying that our *desires* are the mere outcome of these natural impulses; but we do quarrel with him for assuming that our *will* has the same origin and nothing more. And when he jumps to the conclusion that the will is not free *because* the natural desires are not free, we are compelled to pull him up, and to protest that such a conclusion is wholly unwarrantable. It is, in short, simply ignoring that there is any such thing as will. I shall not, however, dwell farther on this, as Dr. Irons has already so clearly reminded us what is the true character of the will as one most important element in the *ego*: but I wished to call attention to the fact that Mr. Spencer is not really *arguing* against the freedom of the *will*; he is arguing against the freedom of the *desires*, and then *assuming* that the freedom of the will is by the same arguments disproved. (Applause.)

REV. C. L. ENGSTRÖM.—Thirteen or fourteen years ago, when I was reading the Duke of Argyll's book, "*The Reign of Law*," I saw what every one must see who gives the subject sufficient consideration, that the mind is subject to law as well as the body, and I think that unless we grasp this thought we cannot understand Mr. Herbert Spencer's argument. Further, we are wrong, I think, if we regard the (free) will as a separate originating force; the mistake seems to arise from the use of the word will in two entirely different senses. A *strong will* really indicates a strong mental nature, especially in regard to the desires, but *free will* is the ability to choose which of two or more existing forces shall come into operation. A strong will is a magnificent force directed by free will for good or for evil. The responsibility rests with the free will, though the strong will, which is merely an instrument in its

hands, gets the blame when it is misdirected. But not to dwell overmuch on this magnificent, but subject force, we ought, as it seems to me, to hold that above the body and the mind, which consist, according to the best philosophers, of three departments—feelings, ideas, and desires—there reigns supreme a thing called the (free) will, and that that free will has the power in the case of every human being of *directing* actual forces, whether physical or psychical. It is a directing power and not a creative power—resembling the pointsman, who sees a railway engine hurrying along a line, and by the simple movement of a lever, gives it that direction which secures the safety of the train. And so all through the life of the human being this will of ours (most free, when voluntarily subordinating itself to the higher Will of the Creator) directs our course for good or evil, it being in accordance with the way in which the will operates within us that we become good or bad. From the earliest moment of conscious choice we are admitting or excluding, fostering or destroying, good feelings or bad feelings, good ideas or bad ideas, good desires or bad desires, and side by side exalting or depressing the higher (psychical) or the lower (physical) natures, and in the case of a Christian welcoming or driving away the Holy Spirit of God, or the arch enemy. Thus from moment to moment we are weaving into that nature and character, with which we started on our course, new threads, and thus we by free will change the stream of our tendencies, and become what we are—heavenly, Christian, Godlike, or earthly, sensual, devilish. (Hear.)

Rev. W. D. GROUND.—I thank you all very much for the kind attention you have given to my paper. When I see the notes of this discussion, I shall think them over and add what I may deem it best to say. But let us all clearly understand that in this matter, although we need not accept the philosophical doctrine of necessarianism, we ought, as devout Christians, to accept the great doctrine of grace. I think the remarks made by Mr. Enmore Jones may help us at least to an illustration of the matter. He spoke of the inspiration,—I cannot call it anything else,—which occasionally comes upon us. Now it seems to me that, in much the same way, a power which we receive from above appears to come behind the will, when we have placed the will in a right direction, which power acts like a breath or *afflatus*, bearing us on towards divine thoughts and desires. This seems to me the action of divine grace. But at the same time I think that the assertion of man's need of such grace is consistent with the maintenance to the fullest extent of the philosophical doctrine of the freedom of the will; and that it is impossible to deny this freedom of the will, and yet to defend successfully man's moral responsibility. This is the great citadel we must maintain at all cost. We must say that the sense implanted within us, which tells us we are free and uncontrolled, is the deepest and truest part of our being, and nothing else must be allowed to usurp its place. No doubt there are intellectual difficulties in holding the theory of moral liberty. For myself I accept heartily Hamilton's "Law of the Conditioned," which, I hold, sweeps away all the difficulties, establishes reason

on a rock which cannot be shaken, and provides an impregnable fortress for all the doctrines which contain the philosophy of moral obligation. (Applause.)

The meeting was then adjourned.

REMARKS BY THE RIGHT HON. THE LORD O'NEILL.

I look upon both this and the former paper contributed by Mr. Ground as very valuable contributions to the literature of the Victoria Institute. In the present one he seems to me to have quite correctly pointed out the fallacy which pervades Mr. Herbert Spencer's system of psychology, namely, his making the *ego* to be nothing but the aggregate of feelings and ideas, existing at each moment. Where or in what such ideas and feelings exist, is a question to which Mr. Spencer does not supply us with a satisfactory answer. He does not, of course, mean all ideas and feelings throughout the universe, inasmuch as these consist of innumerable aggregates; and if he means those belonging to any one person, he is not consistent with himself, inasmuch as, on his theory, there is no such thing as personality in any intelligible sense of the word. His view would destroy the *ego* altogether. For who can guarantee that the aggregate of ideas and feelings at any one moment will be the same as at another? In fact, this aggregate is ever-varying. I may be thinking of one subject at one moment and of another at another. I may be glad now, and sorry a few moments hence. In short, my state,—*i.e.*, the aggregate of my ideas and feelings,—may at any instant be quite different, nay, opposite, to what it was at the instant immediately preceding. Indeed, it is scarcely possible, on Mr. Spencer's principles, to express oneself correctly on this subject. For when I say, "I may be glad or sorry," or when I speak of the aggregate of *my* feelings, &c., an *ego* distinct from those ideas and feelings is necessarily implied; nor could I express my meaning intelligibly without implying it. Mr. Spencer himself, as Mr. Ground has observed, although his language is most carefully chosen, cannot help, in one passage, speaking of "*the subject* of such psychical changes," &c., although he does not admit that there is any subject in which such changes could take place. In short, with all his ingenuity, he cannot get over the fact that feeling cannot take place unless there be something which feels, nor can thought be exercised unless there be something which thinks. As well might we assert that there may be motion without anything moving or being moved. Thus ideas and feelings necessarily imply an *ego* which perceives and feels, and which, at the same time, is distinct from perception and feeling, as being the subject of which these are states or accidents. Well may Mr. Ground say that the fiercest assailant of Berkeley appears here possessed of a double portion of his spirit.—In fact, in asserting that the *ego* is but an aggregate of ideas and feelings, he goes as far as Hume, who did much to explode Berkeley's views (though such was not his

intention) by showing the consequences to which they lead, when logically carried out. Berkeley held that the only realities are Mind and Ideas, the former being the vehicle of the latter. Hume saw no necessity for the vehicle, considering that Ideas do not require such ; and between his theory and that of Mr. Spencer it is not easy to see any difference. Berkeley imagined that his theory gave the death-blow to materialism, as, indeed, the denial of the existence of Matter would, at first sight, appear to do. Yet here we have Mr. Spencer, the prince of materialists, actually carrying Berkeley's views to an extreme never contemplated by their propounder.

Mr. Ground has done good service in pointing out the distinction between the metaphysical and the theological doctrines respecting the human will. As in the one, so in the other, there are various shades of opinion, the theologians believing that their views are in accordance with the Scriptures, while the metaphysicians consider theirs to be such as Reason discovers. The various views prevalent among theologians divide conveniently into three primary ones:—1, that of the Pelagians, who deny that the descendants of Adam and Eve are born with a nature prone to sin, and who, consequently, look upon all mankind as morally free, requiring no spiritual aid to counteract the allurements of "the world, the flesh, and the devil ;" 2, that of those who believe that all are born with the taint of original sin, and without moral freedom until divine grace confers it upon them by restoring them to that "image of God" which was lost to man through the Fall ; and that, when they are thus restored, they are free either to yield themselves to the divine influence or resist it, as their will may determine ; and, 3, that of those who, agreeing with the last-mentioned class in denying moral freedom to those unaided by grace, yet differ with them as to the effect of grace on the minds of those to whom it has once been imparted. Instead of holding that men are free to accept or reject spiritual influences, they believe that grace, once given, is irresistible, and that they to whom it is imparted, although still subject to sins and imperfections, will never be allowed to fall away finally and be lost. And inasmuch as the world, and even the Christian Church, contains many who show no symptoms of that improvement of character which is a mark of divine grace, it is almost a necessary corollary from this third division of doctrine that grace is not offered to all, and that many are left in that helpless and enslaved state from which nothing that they can do will save them. And such, accordingly, is the view adopted by most of those who hold grace to be irresistible.

The question, Which of these three theological views is the most conformable to Scripture, is one of pure theology, and it would, as I conceive, be out of place to discuss it in these pages. It is more to the point to observe that that they all belong to a region quite apart from the metaphysical question. The most strenuous assertor of Free Will in the theological sense,—the Pelagian,—might, without inconsistency (however untrue), deny it with Mr. Spencer in the metaphysical sense. All that the Pelagian cares to assert is that all men are born free from original sin, and do not require divine aid to

keep them from offending God. It is enough for him, therefore, that the will should be uncontrolled, either by sinful propensities on the one hand, or by spiritual influences on the other. This conceded, it is a matter of indifference to him whether, as a metaphysical tenet, the relation of the will to the brain-molecules be held to be that of master or slave. He denies original sin. To the metaphysician of Mr. Spencer's school it is a matter of no importance whether he does or no. It is a question into which the latter does not enter. He considers us mere machines, unable to direct or control our wills, which are the slaves of mechanical law ; and it is nothing to him whether the impelling power is terrestrial or celestial.

REMARKS BY THE REV. CANON SAUMAREZ SMITH, B.D.

(Principal of St. Aidan's College.)

Thanks for sending me proof of Mr. Ground's paper. I wish I could be present at the discussion of it. It seems to me most important that the tendencies of Determinism current in some of the philosophical and scientific literature of the day should be strenuously opposed by philosophical arguments as well as by theological teaching.

I think that Mr. Ground has shown, clearly and temperately, the thoroughly unsatisfactory nature of Mr. H. Spencer's reasoning, in the extracts quoted.

Mr. Spencer refuses to take into account one side of the *dual* deliverance of consciousness. He reduces all his calculations to the standard of Matter, for, in spite of his language about Mind, he does in effect make Mind a product of Matter. He regards man as a bundle of transitory psychical conditions with no *ego*, as the subject of the mental phenomena, and yet he regards the phenomena as real.

He seems to treat of our consciousness as if it were not inseparable from *self-consciousness*. He argues, in fact, that this self-consciousness (by which surely we must mean consciousness of a freedom to will in a certain measure) is an "illusion"; and that instead of an individual power to choose, or refuse, certain lines of action, our "composite psychical state," in which we only imagine that we are exercising any personal volition, is a predetermined product of an "infinite of previous experiences registered in (man's) nervous structure, co-operating with the immediate impressions on his senses."

Mr. Ground has clearly shown how Mr. Spencer contradicts himself in speaking of "the subject" of psychical changes, while he practically denies that there is any such subject.

No one can make a thorough philosophical estimate of human nature who ignores the *personal* side of the original "deliverance of consciousness." The "*I am*" of man lies at the root of all conscious exercise of intelligence,

emotion, choice ; and you cannot theorise away this positive factor into a mere mystical zero, any more than you can get rid of the great primal *I AM* by refusing to think of Him as knowable.

It is by means of *volitions* that a man is most directly conscious of his own personality. He knows that he can resist certain impulses and inclinations ; that he can refuse to do what he is commanded to do by others, or tempted to do by some motive to which his Reason or Judgment does not assent. Conscious of this freedom (for freedom it is, however it may be ultimately limited by Law or moulded by a higher Will), man feels himself to be a responsible agent. Without it, he would not be man.

The philosopher, metaphysical or ethical, must, if he honestly take into account all phenomena, treat the existence of free will in man as a fundamental truth. The theologian has another question to deal with (though it is very much bound up with the broader philosophical one) when he inquires into the amount of moral strength, or extent of moral helplessness, found in the human will, after it has been once perverted by disobedience to Divine Law.

The metaphysical postulate is, that Man's Will is free : the ethical axiom is, that Man is responsible for what he does ; the teaching of the Christian religion is, that Man's Will, perverted and enfeebled for good by sin, is by God's grace restored to the highest condition of freedom, where the Divine Will and the Human Will concur, and in the *service* of God man finds his perfect *freedom*.

FURTHER REPLY BY THE AUTHOR.

I have now read with extreme care, many times over, the remarks made by the various speakers, and the notes since appended by Lord O'Neill and Canon Saumarez Smith. The whole forms, I think, an instructive commentary on the unity in variety which marks those who think alike on the deepest and most formative conceptions. There is one spirit dwelling in all,—the differences are only superficial, the unity is deep and structural. Necessarily from eleven minds united we get a larger, and more complete view of the full-orbed truth than can be obtained by any one mind. As the chairman and several of the speakers agree that the Freedom of the Will is the one point wherein the upholders of Revelation and the Moral Law clash most distinctly, and in irreconcilable antagonism, with the advocates of Determinism and Automatism, I trust that the importance of the subject will justify me if I attempt to reduce to a consistent logical unity what has been contributed by all who have taken part in the discussion. Truth is one,—it is the intellectual expression of the one God ; all his servants have broken glimpses of the full-orbed idea ; what one lacks another supplies. Let us then try to blend all into one clear and luminous image. We all are

agreed that the *ego* is an entity, the subject of its various states, which states, for convenience, we classify into intellect, emotions, desires, conscience, and will. Two (Dr. Irons and Canon Saumarez Smith) point out very justly that the *ego*, as the centre and seat of personality, is the active and determining power, holding in control all the faculties. Lord O'Neill, Prebendary Row, and others, show that to deny the existence of this *ego* is to deny the central fact of consciousness, on which consciousness all our knowledge founds. We all again agree that this *ego* has various desires, which clash one with another, and one (Rev. F. N. Oxenham) points out that Mr. Spencer's reasoning is justified, if there are *only* desires in us. But then we all assert that there is a power in us which rides above and controls the desires. Canon Saumarez Smith shows that it is the consciousness of this power which most distinctly calls up the sense of personality. Examining the nature of this power, the Rev. C. L. Engstrom points out that its chief office is directive, and not creative, pointing out a line to be taken, and not a *δύναμις* which moves along that line; and Mr. Enmore Jones fits it with this by reminding us that when our will has indicated the direction to be taken, a breath or *afflatus* sometimes comes upon us, which is like a wind swelling out our sails, and bearing us on in the direction to which we have made the prow of our ship to point. Now, a power which is directive is only an executive; it simply points out the way to be taken, and it needs the guidance of other forces, if, indeed, it be guided by intelligence at all. This intelligence we all assert. (Any one who says he is not intelligent probably speaks the truth.) But we all agree that this directive power in us is free; that it is under the supreme control of the *ego*. But being free, and able to steer any whither, it needs some object on which the eye can be fixed, which object, as Dr. Fisher reminds us, is what we call the determining motive. The motive chosen, he also says, is at once the outcome and index of the moral state. Dr. Irons, again, reminds us that the motive is only an incitement to action; it does not move us, it is the *ego* that is the moving force. Motive is only the object on which the *ego* has fixed, and it can no more move us than the pole-star can move the sailor who steers by it. Asserting, as we all do, that the *ego* has freedom of choice, Mr. W. Griffiths contributes valuable and weighty arguments in support of the proposition. The system of jurisprudence in all countries of the globe, he shows, implies it, and the distinction drawn between unintentional wrong, wrong committed by infants or lunatics, and wrong committed by criminals, shows clearly that all human jurisprudence makes intent or motive to be the essential factor in deciding the moral quality of an action. Professor O'Dell then shows that the extent of this freedom is unlimited, and that not even the tremendous penalty of eternal destruction can supply motive sufficient to move the will of some. We all agree that there is a power in us called conscience, which claims the right to decide the motives which we choose to rule us, and that on disobeying this power we incur the condemnation called guilt. The Rev. C. L. Engstrom then puts the climax on the metaphysical argument by showing that we reap

as we have sown, we are changed into the shape of the motive we have chosen to rule us.

We come next to the bearing of the question on theological truths. We all hold that although man is free, he has yet not strength, of himself, to choose the right and the holy. This inability seems to me explained by the two truths urged by the Rev. C. L. Engstrom and Mr. Enmore Jones. The first shows that the will is directive. Therefore, willingly yielding to the gentle pressure of the good spirit, a man may himself fix his direction towards good. But this mere direction *has no dynamical force*, it is only something which can point. Behind this directing element, then, a power in the nature of an energy, or a *δύναμις*, may come, which can fill out the directing will with a heavenly power, and bear it onward, in the direction it has chosen, towards the embodied motive which it has selected to rule. This has seemed to me for some years the philosophical reconciliation of the two counter-truths of man's freedom and responsibility (growing, as Prebendary Row remarks, out of the very centre of the moral character of God), and of man's need of divine grace, laying the axe at the root of all human pride, and bidding each one of us remember that we are only empty vessels, which, to be of any use, the divine fulness must fill. I think this welds into a coherent logical unity the substance of what has been said.

Lord O'Neill's closing remarks are very interesting and suggestive.

ON
CAVES.

BY

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A PAPER READ BEFORE THE VICTORIA INSTITUTE.

*WITH REMARKS BY SIR J. W. DAWSON, K.C.M.G., F.R.S., SIR WARINGTON
W. SMYTH, F.R.S., AND OTHERS.*

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ON CAVES. By T. McKENNY HUGHES, M.A., F.S.A.,
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NOW and then it falls to our lot to find an old MS. which throws a flood of light upon some obscure part of history. It had been put aside, buried under a heap of documents of more immediate importance, forgotten till some accident exposed it, some more careful eye caught sight of it, some more experienced judgment recognised its interest.

Such to the geologist is a cave.

He runs his eye over the contents; they may be of little value, or may settle what has long been a matter of speculation or of controversy. They may be a record of the household consumption of some wild beast in his castle; they may tell of the ancient conflict of forces of nature now at rest; or they may derive their chief interest from the character of the material on which the record is preserved.

But the MS. might be passed over, or not read aright, if the discoverer be no palæographer.

So the observer may arrive at very wrong conclusions as to the age and history of a cave, unless he be familiar with the operations of nature which form and fill such caves. This, then, is the point on which I invite discussion this evening: The formation of caves and cave-deposits, with references to some of the more interesting of those which have been explored.

To arrange our subject, I would first notice that there are artificial as well as natural caves, and many natural caves

modified by man. In quite recent times, the soft New Red Sandstone has been scooped out into cells and summer-houses. The chalk has been excavated from very early times in the search for flint, and traces of sojourn in such pits are not wanting. We need not stop seriously to discuss the suggestion that Fingal's Cave was excavated by man. The rock-hewn tombs around Jerusalem, the catacombs of Italy and Egypt are artificial caves.

All along the Vezère and other cliff-margined valleys in the South of France we see the natural caves and rock-shelters, modified sometimes by man, walled up and occupied as store-houses, or even as dwellings. History tells us that those caves were frequently held by troops during the long occupation of that part of France by the English. The Rock of Tayac, like Gibraltar, "a kind of fortress entirely hollowed out of the rock," is frequently mentioned in the history of the wars of the fourteenth and fifteenth centuries.* And the Aquitani, when pressed by Cæsar's troops, retreated to their caves in South-central France. I have heard of a man who lived for some time in a cave in Yorkshire, coming out at night for food; milk from the neighbours' cows, eggs, or whatever else he could lay hands on. There were many odds and ends in that cave which might have been relics of his sojourn, as well as others of more remote antiquity.†

There are hardly any records of research in caves which are known to have been occupied in recent or historic times. A systematic examination of all the caves in which history tells us the inhabitants of any district once took refuge, and an exact description of all found and observed in them, would be very interesting, and might furnish important evidence bearing upon doubtful questions.

Artificial caves, however, or artificially modified caves, form a very small proportion of those with which we have chiefly to do. The caves in which primæval man lived, and into which in old times hyenas dragged carcasses of the animals they killed or found dead along the river-courses, were all natural caves. So are the celebrated stalactite caves of Germany and America. But we must inquire into the mode of formation of natural caves if we would understand the conditions which surrounded primæval man or speculate on his age.

There are sea-caves formed by the waves that lash the cliffs as if sounding them to find their weaker places. The water

* *Reliquiæ Aquitanicæ*, p. 4.

† Exploration of Cave Ha, *Journ. Anthropological Inst.* 1874.

itself would soon destroy a jointed rock. As each storm-wave rolls in, it deals a tremendous blow on the fissured mass. Every thin packing of clay between contiguous blocks is soon washed out, and the fissures themselves enlarged. Then there comes into play another action. The space behind the block is filled with water; the thumping wave falls on the narrow opening on one side of it, not on the whole at once; the force is multiplied ten or a hundred times by the hydrostatic paradox, and the block is hammered out. Even in a river this operation is seen going on. Along the valley above Sedgwick's old home in Dent, thin beds of carboniferous limestone with shaley partings form the bed of the stream. The shale perishes, and the great slabs, 5 feet to 10 feet across and nearly 1 foot thick, lie side by side on the bed of the stream. Then in one of the floods so frequent in that district the fissured limestone is filled, and the surplus water rushes in a torrent over the usually almost dry channel. A slab is lifted by the hydrostatic paradox, turned over by the torrent, perhaps swept down, or often left a record of the lifting force which got it out of its bed, but in doing so destroyed the machinery by which it lifted it. So sea-cliffs are more apt to be scooped out into caves and crannies where the rock is jointed or crushed. Any soft, readily-decomposed dyke traversing the harder rock is also more easily removed.

But that is not the only process by which these sea-caves are formed. On the coast of Pembrokeshire, near St. Davids, there is a hole among the crags near high-water mark where, at a certain state of the tide, with each recoiling wave there is a loud sucking noise as the air is being forcibly drawn in through small, wet, weed-covered fissures to take the place of the receding water. It is known as *Llesugn* from the sound. Were it not for the cracks communicating with the air above we should not be reminded of this force being exercised by every wave in the cave below. Any loose material would be drawn back with the wave, and perhaps carried out of the cave altogether. Many of us are familiar with the phenomena known as "Blow Holes," or "Puffing Holes." The incoming wave fills the tapering cave, and, just as the bore coming up a tidal river rises higher and runs more fiercely when the converging banks force it to pursue its way through a more contracted channel, so when the wave rushes into a narrowing, funnel-shaped cave, with a small aperture communicating with the surface, the water is forced up through the opening, and often a spout of spray is carried high into the air. All these phenomena tell us of the enormous force exerted by the waves

upon the coast, and explain how caves must everywhere be formed where shattered or softer rock is exposed to the lash of the wind-driven sea.

But this is not all. The wave picks up great boulders and hurls them at the rocks that bar its advance. It is quite common, after a storm, to find large stones lodged on a promenade or pier, where they must have been caught up *in* the wave and thrown upon the land. Stones are always carried forward *up an incline* as far as the waves advance; but the cases I refer to now are those in which the stone has been thrown up to the top of a vertical wall. The last place I remember having seen this was in a great storm a few years ago at Hunstanton. The same thing takes place on a grand scale on some of the wild, rocky cliffs of North-Western Scotland, for instance. The Director-General of the Survey has described how in storm, great blocks are hurled up on to the top of the cliff near the Old Man of Hoy.

The force of the Atlantic waves at the Skerryvore Rocks, as estimated by the marine dynamometer, an instrument designed by Thos. Stevenson for this purpose, was found to be as much as 6,083 lb. to the square foot.*

From the height to which the spray was thrown, he inferred a pressure of about 3 tons to the square foot; and further recorded that a block of stone, estimated at 48 tons in weight, "was seen to move under the influence of each wave."†

"On the Bound Skerry of Whalsey, which is only exposed to the waves of the North Sea or German Ocean, he had found . . . masses of rock weighing $9\frac{1}{2}$ tons and under, heaped together by the action of the waves at the level of no less than 62 feet above the sea; and others ranging from 6 to $13\frac{1}{2}$ tons were found to have been quarried out of their positions *in situ*, at levels of from 70 to 74 feet above the sea. Another block of $7\frac{7}{8}$ tons, at the level of 20 feet above the sea, had been quarried out and transported to a distance of 73 feet . . . over opposing abrupt faces as much as 7 feet in height." (‡)

It is clear that such waves and such boulders would make short work of broken rock or a rotten dyke, and any old cave or fissure opened out by the sea would not be likely to have much of the original deposits left in it. The first storm would clear out all earth and bones, and leave in its place only the well-worn pebbles of a rocky shore—the battered shot of nature's great marine artillery. A sudden upheaval would leave the cave either quite clear, if it was on a clean,

(*) Stevenson, Thos. *Edin. New Phil. Jour.* xlviii. 1850, p. 41.

(†) Ditto, *Proc. R. Soc. Edin.* vol. ii. 1844-50, p. 13.

(‡) Ditto, *Proc. R. Soc. Edin.* vol. iv. 1862, p. 200.

rocky shore, or filled with heaped-up pebbles, if it opened on to a shingle beach. By its form and by its contents we could generally make a shrewd guess whether it was a sea-cave or not. We should ask whether the parts where the cave expands are those on which the sea would act with greatest force and efficiency, or whether the shape could be better explained by reference to torrents coming in the other way. We should examine the contents to see whether in their character or arrangement they indicated the action of the in-rushing water, or whether they are such as could never have survived the scour of tidal and wind-driven waves. When we have to inquire into the origin of caves in inland cliffs and on mountain-sides, now far above the sea, where many of the traces above-described may have been long removed by denudation, there are further tests to be applied. There we should have regard to their manner of occurrence and their place in the physical geography of the neighbourhood. A sea-cave does not necessarily, or even commonly occur in the line of drainage from the uplands, but in the higher cliffs and headlands between the valleys that run down to the sea. Whereas the caves due to subterranean water-courses lie in the lines of drainage; and the caves due to sub-aërial waste coincide in distribution with the outcrop of the beds that readily lend themselves to that kind of weathering.

Moreover, allowing for the possibility of unequal elevation of different parts of a coast-line, we can still generally find sufficient evidence to show whether the rock in which the cave occurs forms part of an old sea-cliff or of an escarpment.*

We must remember also that during the formation of a sea-cave the base of the cliff is being swept by the sea. Sometimes an inland stream washes the base of a rock in which a watercourse cave has its outfall, but generally in the case of inland-formed caves a vast mass of talus is being formed along the base of the cliff in which the cave occurs. The scour of floods may keep the mouth open, but as the water is being drained off to other and lower levels, this sweeping of the cave mouth ceases, and the cave deposits show interbedded fallen rock and transported earth and stones, and often the remains of animals.

As a general statement we may say that a typical sea-cave runs into a cliff which rises vertically from the level of the

* Cf. Whitaker, *Q.J.G.S.* vol. xxiii. c. 186, p. 265. *Geol. Mag.* vol. iv. 1867, pp. 457, 443.

floor of the cave, or is even undercut a little, because the talus has always been removed from the base, so that the fragments broke away all over the face of the cliff from top to bottom, and the base sometimes was even undermined by the waves.

In the case of an inland cliff, on the contrary, the fallen rock is not removed, so that only the upper part of the cliff above the sloping mass of talus is exposed to the action of the weather. The exposed part is reduced in height as the talus grows, so that the cliff keeps on receding above only, as the talus keeps covering up more and more of the lower part.

The form that a chalk cliff would eventually have behind the talus has been calculated by the Rev. O. Fisher.*

Of course, the sea-cliff, when removed inland by elevation, gets, after a time, eaten back by sub-aërial weathering, and covered over by talus like any ordinary escarpment.

Gaping fissures of such a character that they could in any case be looked upon as caves are very rare, but the fault-breccia that commonly fills such cracks is easily removed, and the various denuding agencies are apt to follow fissures, and thus caves be formed along them. The unequal flow of lava curling and coiling over the half-cooled mass of earlier flows sometimes leaves openings like caves.

It is said that some of the caves in volcanic districts are opened out by the various acidic vapours which act on the micaceous and other schistose rocks which have been already fissured by the earthquakes so frequent in those countries—as, for instance, in the case of some of the caves of Corinth and the Cyclades.†

These are, however, few and unimportant, seldom occurring where a cave would be much frequented by man or the lower animals.

The commonest caves and those which generally have proved of greatest interest, are the old subterranean watercourses so frequent in limestone rocks. The way in which these caves are formed is well known, but many of the phenomena connected with them appear to be less clearly understood, and so we hear of various startling theories propounded which, on inquiry, turn out to be based on a wrong interpretation of the mode of formation of the deposits found

* *Geol. Mag.*, vol. iii. 1866, p. 354. See also Davison, *Geol. Mag.* vol. 1886, p. 65.

† Virlet, *Bull. Soc. Géol. de France*, t. ii. p. 329.

in such caves. It is to these questions I especially invite attention to-night, and in the selection of examples in illustration I shall be chiefly guided by the desire to make clear the distinction between the age of the caves and of the cave deposits, and the mode of formation of the cave earth and laminated clays, stalagmitic floors, and broken-up travertine breccias, stream-gravel, and angular talus.

First, I would just remind you that these caves are formed in a rock which can not only be mechanically broken up and carried off, but can also be dissolved in water and carried away in solution wherever water can pass. Even pure water can take up two grains per gallon of carbonate of lime, of which these rocks are largely composed. But pure water is very rarely found in nature. The rain generally takes up some carbonic acid from the air, and when it falls on the ground gets a great deal more from the decomposing vegetation, and water with carbonic acid in it acts rapidly upon the limestone rock, carrying off part of it as a bicarbonate of lime, while the earthy part is washed away in mechanical suspension till it settles down in some pool of still water as mud, often forming a considerable part of the cave-earth which fills all the interstices of the broken rock. As may be seen by the analysis of hard waters, it is not uncommon to get 25 grains per gallon of carbonate of lime in the water of limestone districts, and this means the never-ceasing operation of the agencies which tend to form caves.

So, of course, the most favourable conditions for the formation of such caves are—First, a limestone into which the water can trickle down along joints and fissures, and find its way out at some lower level. Secondly, an area over which the rain can gather into streamlets and collect from vegetation the acids which will help it to dissolve the rock. The crack into which the water first finds its way may be very small; the water soon opens it out, acting first chemically, then mechanically, on the surrounding rock. When the sand and broken rock get a free passage, mountain torrents, full of débris torn from the hill-side or washed out of ancient boulder-clays, are precipitated into the chasms, which take the place of the half-opened joint, and the work goes on apace.

It is quite clear that in such circumstances it must often happen that, as the clay or shale on the hill-side is being denuded away, the water must find its way into the jointed limestone further and further back continually, and, in the deep recesses of the mountain, new channels must often carry off the water that once ran higher up. Thus, the higher out-falls are left dry, and then they are in a state for man and

beast to inhabit. Sometimes, however, when all the hill is full after some great thunderstorm, water spurts out of every joint and spouts in torrents from each cave, and until the cave is quite beyond the chance of such catastrophes, we cannot hope to find a clear, continuous record of its old inhabitants.

To give an example of a cave now being formed in one part and periodically modified in another, I will carry you to the flanks of Ingleborough, where the conditions are peculiarly well suited for the formation of caves and for the examination of all the accompanying phenomena. Many of you are familiar with the form of the grand bluff known as Ingleborough—the most conspicuous feature as you look north from Lancashire towards the borders of Yorkshire and Westmoreland. Its flat cap of millstone grit ; its steep slopes of rapidly-crumbling Yoredale shale, here and there braced up by *throughs* of sandstone, or grit, or limestone ; its great table of mountain limestone, on which these all stand ; and its base of Cambrian and Silurian, altogether combine to furnish some of the most charming bits of scenery and most interesting bits of geology in the kingdom. On the S.E. slopes of Ingleborough is a great hollow space where the water runs off the impervious Yoredale shale and the patchy drift down to the basement table of mountain limestone. The drainage area is about a square mile, and the stream is usually small and generally lost at once in the first open joints of the limestone that it gets to. But a flush of rain-water soon fills these crevices to overflowing, and the surplus water rushes on 100 yards or so to a great chasm, known as Gaping Gill Hole, into which it plunges with a roar. The air dragged down, tangled in the water, ascends in a current, carrying mist and spray far above the chasm's brink. I have watched this wonderful abyss many a day of storm and sunshine. No one has ever been to the bottom of it ; but I can tell you something more about it that bears directly on the subject we are considering.

In that country, so favourable for the formation of all the various kinds of swallow-hole, cave, and keld, I once had the good fortune to witness one of those grand storms which in a few minutes change the face of nature, and in a few hours leave a mark that ages may not efface.

I had climbed some way up Ingleborough. It was a glorious July morning. Myriads of insects were busy with their own various pursuits. The haymakers were hard at work ; more hurried, perhaps, as the weatherwise saw thickenings towards the south, and felt the sultry heat that warned them

there might be a storm. I turned now and then as I got higher, and saw the mist gather on the southern horizon. Soon it took shape and formed in the eddies as the rapidly-rising wind crept on. Two principal masses of cloud came crowding up, converging on Ingleborough, from Lancaster and Clitheroe. I had once before seen that kind of sky in South Wales, and, a few hours after, thirty-eight bridges were carried away in our county. So warned, I hurried homewards, and it was well I did. The clouds appeared to me to be rolling on in vertical planes. I ran, and only just got in to my inn before the worst was on us. Drenched haymakers, who had lingered too long in some insufficient temporary shelter, kept coming into the village. The storm burst with all its fury on the south-eastern flank of Ingleborough.

The stream that drains that area runs through the village of Clapham. The valley is dammed close above the village, to form a small tarn. This soon felt the flood, but, of course, the equalising effect of a lake upon the stream below it prevented our realising the tremendous rainfall for a time; because, before the stream could be raised six feet as it flowed out of this lake, the whole area of the lake had to be raised to that extent. But very soon this was done and the arch was filled, and a great spout of turbid water was projected forward on to the rocks at the base of the dam above the church. I went up the valley round the lake towards the celebrated Ingleborough Cave. It was a striking scene. Water spurted out of every crack and joint in the rocks, but the united subterranean watercourses could not carry it all, and the overflow from the drift-covered country above the usual outfalls rushed down the valley, carrying mud and boulders with it in its headlong course. The stream below the cave runs over bare limestone for a considerable distance, and the noise made by the boulders, as they were rolled along the rocky floor, was so great that my companions thought the thunder-storm was beginning again and hurried home. I went on to the great cave. Here I saw a wonderful sight. The lower cave was full, and the water was spouting out of the upper cave, which is usually dry, as you pour water out of the mouth of a kettle; and well it might, for, if the swallow-hole that feeds it was full to overflowing, it had had the pressure of more than eleven atmospheres upon it.

This was one of the most instructive geological phenomena it has ever fallen to my lot to witness. Here I saw what was, to all intents and purposes, a local cataclysm. Gentle slopes of pasture, where usually no stream ran, were suddenly gashed by a torrent, and the débris swept far away across the

lowlands. Underground passages, high above the present water-channels, were swept clean by the body of water forced through them under enormous pressure. Caves that had been sealed up for years with barriers of stalagmite, which one would have thought might have defied the rush of any flood, were burst open. Most of this débris—all, in fact, that was moved by the first rush of water—was carried down the valley. Some remained around the mouth, and some in embayed corners in the caves. Here we saw fragments of stalagmitic floors, mixed up with débris washed in from the swallow-holes above. Some might have seen here evidence that, after the cave had been formed and occupied and gently filled by earth and coated and partitioned by stalactite and stalagmite, there came an age of flood—perhaps of submergence—when the old deposits were re-sorted, the old floors broken up, and that the cave then entered upon another phase of its history. How different the facts! I saw this revolution taking place. It was all over in three short hours. It was another illustration of the great law of Uniformitarianism, which I have heard the Duke of Argyll well state thus: *Local catastrophic action is not inconsistent with continuity of causation.*

We must bear these things in mind when we are examining cave-deposits.

The peat torn away from the mountain-side above was so beaten up in this great natural churn that the water of the tarn did not get clear for months. The sediment did not settle for three weeks in a long glass which I filled during the flood. There must have been a layer of fine carbonaceous clay formed over the bottom of the tarn and in many a deep cave-pool after that storm. When the rain ceased, the water soon ran off the mountain-side, and I went up to examine Gaping Gill, the great swallow-hole that feeds the cave. I found a passage opened out among some blocks on one side of the stream a little above the chasm. I thought I might perhaps find a zigzag descent, which would lead me down into Gaping Gill Hole. So I crept in.

I soon got beyond the light, and therefore took the precaution of throwing stones in front of me before I advanced. I found the slope increased rapidly, and then all of a sudden the stones dropped into a deep hole, down which they whirled, knocking the sides here and there till they dropped, with a booming noise, into deep water below. I wriggled out, and returned another day, with friends and candles and string, for I could not drop the stones straight so as to clear the sides, and so estimate the depth by the time they took in

falling. Sometimes the weight I attached to the string was too small, so that the increased weight of the string itself, when wetted by the splash of underground waters, prevented my being able to judge whether my plummet had touched the surface of the water below or not. Sometimes the jagged rocks cut my string, and I lost hundreds of feet in this way. At last, however, I got the right sort of string and a convenient weight, and I found that the water here plunged into a vertical hole 360 feet from the grass-covered turf above.

This was not, however, the principal chasm, and I saw a curious sight on the southern, or lowest, face of the great chasm beyond: it was battered and bruised as if it had been bombarded for hours, and so it had. In that flood hundreds of boulders, carried forward by the rush of water, were hurled against the opposite face of rock, and then, dropping into the great chasm, were hurried away through the subterranean watercourses and caves down to the valley far below, where they still rolled on with a noise like thunder over the smooth, rocky bed of the stream, till arrested when the velocity of the water was checked in the wider spaces, or finally stopped in the little tarn below.

Here was the whole story of the formation and infilling of limestone caves, and the sudden breaking up of all the older deposits and the return of tranquil deposition, to be read in Nature's clearest writing.

First we saw the results of the chemical action of the acidulated water running off the peaty moor, and opening out the crevices in the jointed limestone.

Then there was the mechanical action observed on a grand scale in storm—the boulders and pebbles pounding away the solid rock. And next there was the sand and mud left as the water subsided, and the old state of things returned.

Another curious fact I noticed, which shows how the fragmentary rock is rubbed down into mud by the action of running water. There was a fetid smell arising from this flood water, such as the people about there said they had not perceived before. I followed up the stream, and noticed a great quantity of black sand thrown down here and there along its course. This was derived from the bituminous limestones of the lower part of the Yoredale rocks and the upper part of the mountain limestone, and I at once suspected the cause of the smell. When I rubbed a handful of this sand together there was the same fetid smell at once produced. The air tangled in the seething flood was carried down the valley, and, when released, gave off the gases caught up from the pounded rock.

As we cannot follow these watercourses down from above through all their subterranean wanderings, let us go down into the valley below where the water comes down, and see if we can work our way back into the hill towards the foot of the great chasm, and see what is going on there. It is here we find what is more properly a cave being formed. The water drops from one level to another, then runs along between the beds, and drops again. By putting your ear to the fissured rock in one place, you can hear, from the deep recesses of the earth, the sound of a waterfall that man has never seen. Not far off, a beautiful clear river flows out of the lower cave. This is 600 feet below the swallow-hole, where the water enters on the hill above. When the rain floods the stream above, this, too, runs turbid. Some 20 feet above it is the entrance to the other cave, the celebrated Ingleborough Cave, a more ancient outfall for the water, which now runs at the lower level.

This cave was explored many years ago by Mr. James Farrer. I have followed it for about a quarter of a mile, and, with some others, been let down to a lower level at the end. We squeezed our way along till we came to a long, deep cave, full of water, which seemed to flow gently towards the mouth of the lower cave. In the great flood of 1872, all the subterranean caves and fissures were filled, and the water spouted out of the upper cave, carrying along with it great masses of rock, which helped to break up the stalagmitic floors and barriers. This flood was so exceptional that most of the *débris* was carried clean away; but we saw, when we examined the ground round the mouth of the cave, and the well-known passages inside, what had been going on; how stalagmitic floors had been undermined, broken up, and re-deposited, and how the torrent *débris* was sometimes left in the embayed corners of a limestone cave. But this was a cave not far above the existing watercourse. When a cave has been formed in the side of a rapidly-deepened gorge, where, however high the flood may rise, the water can never sweep it out with a rush, gentler processes of denudation and deposition still go on. The *débris* that falls about the mouth ponds back the rain, and gathers in the fissured rock, and turns in the rivulet that would have trickled down the hill. The damp clay clings to the rock and frets away its surface, and things washed in work their way down along the face of the opening, gradually-weathered limestone, and lie in clay washed down with them.

It is easy to distinguish the chemically-fretted rock from that which has been worn, smoothed, and rounded by the

mechanical action of the sand and pebble-laden water; as you can distinguish the pholas-bored rock from that in which the holes are due to weathering. On the chemically-weathered surface the less soluble grains and bands stand out. This is a useful test.

When any partly-closed cave is invaded by periodic rushes of rain-water, the débris is carried down from above through fissures, or washed in from the mouth, and so we find re-sorted drift and the material of the rainwash from the surface-soil outside the cave occurring also in layers in the cave; and if the cave happens to be occupied by wild animals when not flooded, we find their bones and the remains of their food scattered over the floor or buried in the rainwash.

But when the turbid water fills a pool in the cave or a pond outside it, and the mud is allowed to settle down quietly, the coarser falls first and the finest last. Then the water evaporates or soaks through the sides, or perhaps remains clear and tranquil till the next rain carries in a flood of muddy water. The deposit so formed will have a tendency to split along the layers of coarser sand or loam which first settled down after flood—that is, it would be a laminated clay. As long as the pool was about the same depth, and the amount of mud carried in suspension in the water was the same, the thickness of the laminæ would be practically the same, representing just the mud in one pondful of turbid water, whatever the interval between the refilling of the pond might be. The turbid water may come from the bottom of a glacier, or from melting snow, or from a heavy rainfall; but it certainly has no necessary connection with glacial action. We see laminated clay so formed commonly in the corner of any old quarry, in ditches, or in caves.

In Chapel le Dale, a valley on the west side of Ingleborough, there is a beautiful chasm which has been so opened out by the action of the torrent, that you can get down to the bottom, where the water plunges on to a bed of broken rock and pebbles, through which it passes, as through a sieve or very coarse filter, into the water-courses that carry it off down Chapel le Dale. This great chasm is probably a fair representative of all the large swallow-holes. Hull Pot and Hunt Pot, on the flanks of Whernside, are of the same kind. Probably there is in Gaping Gill somewhere a place where the water in ordinary weather filters through coarse gravel, for I have sent down many boards with a notice on each that I would reward any person who brought it back to me, but I have never heard of one of my notices being found. Yet at times great boulders do get through, so it may be that the

paint of my notices was destroyed in the subterranean water-falls and rapids.

These chasms or funnel-shaped holes are the feeders of the caves. They are only vertical caves formed in the horizontal surface of the rock. They are known as Swallow-holes, Pot-holes, Sink-holes, and in Italy as Dolinas. They have various local names, expressing the idea that they are not part of the more regular and common operations of nature: the Devil's Chaldron, as in French, Chaldrons du Diable, Marmites des Géants, Bêtoires, or, more simply named, they are the Katabothra of the Greeks.

They begin sometimes under the covering of drift, and, when the opening grows too large, or the covering soil is sodden and will not hold its own weight together, the surface breaks in. Mr. Haythornthwaite, of Kirkby Lonsdale, told me that on a farm of his above Wethercote Cave, after wet weather, he once saw one fall in.

How swallow-holes are formed in chalk has been described by Prestwich.*

The age of the cave-deposits is quite a separate question from that of the caves themselves. The formation of the caves was a time of destruction; but the infilling of the caves belonged to a time of accumulation—when there was no great scour through the caves, but the rain carried in earth and stones, if there was loose drift above, or only muddy water if the cave was nearly closed, or perhaps nothing was deposited but the fine unctuous clayey residuum of the chemically-decomposed limestone itself. Angular fragments disengaged by frost or heat formed a barricade about the mouth. Bones were washed in or carried there by beasts of prey—and man. Buckland† referred most of the caves that he explored to hyena-dens. Constant Prevost‡ thought the bones that occurred so thickly in the cave-earth in Franconia were all washed in by torrents. This explanation will hold only in exceptional cases. The bones may have been washed from one part to the other of a cave, and a few do get washed in from above. I have seen three sheep being carried down towards a swallow-hole, and have found two drowned rabbits and some dead trout on the gravel at the bottom of Hunt Pot, on the flanks of Whernside. But we never see the ground so covered with bones of various animals that a flood

* *Q. J. G. S.* vol. x. 1854, p. 222.

† *Reliquiæ Diluvianæ.*

‡ *Mém. Soc. d'Hist. Nat. Paris*, t. iv,

would wash them into caves and form an ossiferous deposit like that in the caves of Franconia.

There can be, however, no general explanation for all bone-bearing caves. We must examine all the evidence in each case, and then form our opinion as to how a particular bone-bed was formed. Buckland's view seems to me to be in most cases the correct one.

So are caves formed and modified and filled and swept clean and filled again, and we must bear all these facts in mind when we attempt to read the story of a cave from the deposits which we find in it.

Broken-up stalagmitic floors are not evidence of the action of the sea, but, on the contrary, must generally be referred to land floods.

Laminated clays are not evidence of glacial action, but only of alternations of muddy and clear water, such as follow rainy and fair weather.

Some of the most interesting caves, in respect of their contents and the light they throw on the history of primæval man, are only rock-shelters—*abris*—such as are seen in the Dordogne district.* They are sometimes longitudinal sections of parts of subterranean watercourses, but are more commonly due to the weathering away of soft rock between two harder beds. It does not always require a stream or direct rainfall to wet the surface of a rock sufficiently to let the frost act upon it. The travelling moisture of the air, condensed in and on the cold rock, is enough, and is probably the chief agent in case of a rock undercut so far that the rain cannot touch it, just as Rendu† explains the film of ice upon the snow at high elevation not by the melting and refreezing of the snow, but by the condensation of the little moisture left in the air which comes in contact with the snow in those high regions.

The carbonate of lime of the limestone is removed by the water and carbonic acid; but where does it go to, and what becomes of the earthy residuum which forms so large a part of some limestones? These can also be traced, and furnish us with evidence of another kind that this subterranean chemical denudation is going on. When the acidulated water falls upon chalk, for instance, and, instead of being collected into rivulets, acts over the whole surface, we find a great mass of red clay, full of flints which have been weathered out. A great part of this red clay is the insoluble portion of the chalk. All limestones have a good deal of iron

* Lartet, Christy, and Jones, *Reliquiæ Aquitanicæ*, 1876.

† Rendu, *Théorie des Glaciers*.

in them. When the limestone is weathered away and the iron is oxydised, it colours the earthy residuum red. So cave deposits are often red. When the same process has been carried on at a considerable depth, as, for instance, over the surface of the chalk where covered by the lower Tertiary deposits, the residuum is unoxidised and green.* The carbonate of lime has been carried away in solution, making the spring and river water hard, lining all kettles and boilers with fur. At the mouth of a cave or a spring-head in a limestone district, where the water first gives off part of its carbonic acid, down goes the carbonate of lime which the water can no longer carry, and coats the moss and grass, and anything on which it can collect; and thus we see in petrifying springs only a proof that the chemical waste, which, under certain conditions, forms caves, is going on continually.

The quantity of travertine thrown down in some districts is enormous. A great part of Rome is built of this, the *Lapis tiburtinus*, so named from Tivoli.

In caves, as the water gets towards the outlet, the carbonate of lime is precipitated round the edge of a pendant drop or on the margin of some tranquil pool, or, instead of the water eating away the walls of the cave, it coats it over with stalactite, and so protects it from further waste. In doing so it frequently closes up altogether the fissures through which the water once ran. So it grows here, stops growing there—is laid on thickly in one place favourable for its rapid precipitation—as, for instance, where the water is splashed over the surrounding stones and aerated at a waterfall, while it takes ages to form a thin film in another adjoining chamber. When the great storm of 1872 broke up the floors at the mouth of Ingleborough Cave, I saw modern ginger-beer bottles which had been buried a foot deep in the stalagmite. On the other hand, Pengelly records that names cut on the walls of Kent's Cavern as far back as the beginning of the seventeenth century† are only just varnished over, as it were, with a thin stalagmitic coating. From the nature of the case this travertineous deposit must be of extremely irregular accumulation, and it is of no value as a measure of the age of the deposits which it covers. On the spray-moistened blades of grass or moss evaporation is rapid, and the travertine soon forms a thick

* *Q. J. G. S.* 1866, p. 402.

† Pengelly, *Brit. Assoc. Reports*. Kent's Cavern Committee, 10th and 11th Report, 1874, 1875.

porous mass; and inside the caves there is a difference in the quantity of water that trickles over different parts, a difference in the amount of carbonate of lime in solution in the water, and a difference in the rate of evaporation and giving-off of the acid gas.

Most of the leading facts with regard to caves and cave-deposits were noticed by Dr. Buckland, and clearly told in his interesting book, the *Reliquiæ Diluvianæ*. We must remember, of course, that he wrote that work to support a theory, and so, when he gets to the description of the gravels, &c., associated with the cave-deposits, either in or near the caverns, he sees in them the evidence of a short and transient, but universal, flood. But he quite realised the long sojourn of the beasts of prey in the caves, and the many generations of animals that furnished them with food. He says that he had estimated that in some of the German caverns the bones found indicated ten times the number of individuals that could in the flesh have been crammed into the cave. He spared no pains in gathering information as to the habits of the modern representatives of the hyæna and other animals whose remains occur in the deposits; and his graphic description leaves little to be added. It is interesting to read his ingenious inquiries into the cause of the polished and worn bones which are found in these old hyæna-dens, which he refers to the trampling of the animals on the fragments as they lay partly imbedded in the muddy floor; pointing out, by way of illustration, how some objects of reverence, in stone or metal, have been rubbed down by the touch of devotees. He probably had in his mind the toe of the bronze statue of St. Peter in Rome, which has been polished and worn by the lips of the faithful.

Buckland's view, that the deposits of the celebrated Kirkdale Cave, and other similar caves which he refers to, would be connected with a great submergence, which he identified with Noah's Flood, was not, however, so wild as we are sometimes inclined to think, in our eagerness to assert the independence of such inquiries from all preconceived ideas or theological tenets. There certainly is evidence in many places along our coasts of small depressions since the occupation of those districts by man, and it is extremely probable that the land had not at any rate recovered its present elevation in this country after the greater submergence that followed on the Glacial age, before man appeared on the scene.

There is a great deal of evidence of torrent-action in these caves. There are marine shells washed into them and buried in the same earth as Palæolithic man and the extinct

mammals. Buckland's view was, as I believe, far more nearly in accordance with facts than the views of those who have argued for the pre-Glacial age of some of these caverns, which contain only the later group of early Pleistocene mammals. It agrees with the view that there has been a great submergence since the occupation of some of the known Pleistocene caves, but is less wild than the theory that the deposits of that submergence are Glacial because they contain a large percentage of material derived from older Glacial deposits. I have already combated the view that the contents of the Victoria Cave * were pre-Glacial, and I have recently† examined the evidence upon which the theory that the contents of the caves of Ffynon Beuno were pre-Glacial because they were anterior to the submergence which followed the Glacial age. This view was far more untenable than that of Dr. Buckland, for its advocates held that if the sea of the last submergence washed the mouth of these caves after they had received the deposits containing the Palæolithic remains now found in them, that in itself would constitute a proof that those remains were pre-Glacial.

It is a very curious thing that, although we find such abundant evidence of Palæolithic man in caves as well as in river deposits, there should be so few remains of his bones. Perhaps it was because such little care was taken of the dead that all traces of them were soon destroyed by beasts of prey. However, the fact remains; and, therefore, it is of great importance to inquire into any alleged occurrence of human bones of Palæolithic date. One such announcement was made some years ago, when it was reported that a whole human skeleton had been found with the remains of the mammoth and other extinct animals in a cave on the coast near Mentone. The skeleton was brought to Paris, where I saw it. In a photograph which was shown to me soon after the discovery there were two Neolithic implements lying beside the body, but these were not exhibited with it in Paris. The body was lying on its side in a red earth, with few fragments of any kind in it. There was a quantity of oxide of iron about the head, which might have been the remains either of ornaments in pyrites or of a pigment formed of redde.

Some years afterwards I had an opportunity of examining the place where it was said to have been found, and of con-

* *Trans. Vict. Inst.* March, 1879, vol. xiii. p. 316.

† *Q. J. G. S.* (Nov. 17, 1886), vol. xliii. 1887, p. 73.

versing about it with M. Bomfils, who was there at the time it was discovered. The cave is one of several which occur east of Mentone in the Limestone Rocks, known as Baousse Rousse, the Red Rocks. The cave was partly filled with cave earth and angular fragments of limestone fallen from the roof and sides. In this the skeleton was found, as far as I could gather, *interred*. I learned that the implements which I noticed in the photograph had not been found with it, but had been put in to make a better picture. It appeared that, though found with the bones of the extinct mammalia, it was not Palæolithic, but buried among them, and so it may have been of any subsequent date. The evidence, however, which appeared to assign its more probable age to it—namely Neolithic—was unfortunately of no value, as the implements were not found with the skeleton, but only placed by it to make a more interesting photograph.

Some caves, like that of Adelsberg, about twenty-six miles east of Trieste, open out into grand halls draped with stalagmite and sparkling with crystalline incrustations. One of the chambers measures $665 \times 640 \times 100$ feet, and in another, on every Whit-Monday, a great ball is given. The work of excavation is still going on here, for a river empties itself into the cavernous rock below the entrance to these grottoes, and is heard roaring in the deep recesses far within the cave.

In other cases, instead of such vast halls, we find a more immense extent of galleries, as in the Mammoth Cave or Kentucky. Both suggest a great lapse of time. In this it is estimated that there are about 150 miles of underground passages. All the drainage of that area drops into great swallow-holes which join the general network of subterranean channels. In them a uniform earth temperature of 54 deg. Fahr. is maintained. No frost and thaw aid the denudation there. As long as the area drained has been unchanged and the amount of acid in the water has not varied, the rate of waste has probably been the same; and though we cannot offer any numerical estimate of the time it has taken to remove so much rock in this way, we cannot help feeling that it must have been very long.

If we turn to the fauna of this cave, we get a peep at Nature carrying on some of her most mysterious work. Here we find animals modified to accord with their surroundings—organs unused being atrophied and lost. Where there was no light, they could not see. So many of the insects, crustaceans and fish are blind. The wild spring and headlong flight of the grasshopper would be dangerous in those dark recesses. The poor insect would dash against the rock or

drop into some treacherous pool. So nature deprived it of wings, and, instead, lengthened its antennæ, so that it could feel in time to save itself when, with less impetuous leaps, it came against an obstacle.

Do these changes also point to a great lapse of time? or may we believe that among the lower forms of life, and those in which the generations follow one another most rapidly, these changes also may be much more rapid? There is nothing in the nature of the case to show that evolution must be slow. If forms of life are modified by their environment, the rate of change in the organic being *may* yet be slow; but, as far as we can see, it often is very rapid. What an opportunity for studying such questions. An animal, the type of liveliness—the sunny grasshopper, the flying ruby emerald or topaz—is plunged at once and for ever into the darkness of earth's innermost recesses. No need of wings, where it dare not fly; no use for eyes, where it cannot see; no advantage in gorgeous hue, where there is no light to be reflected. What will become of it. Nature cuts off its wings; nature blinds its eyes; nature washes out its brilliant colours; but, in compensation, gives it means to guard against its new dangers by lengthening out its antennæ, to let it feel its way about.

If this process is still going on, what will it come to? Does it go on indefinitely throughout all nature, or are there limits of evolution for all, or its own limit for each form? On the one hand, from analogy we learn that we must not assume, because development goes on constantly within our short experience, that it must go on in the same way indefinitely. Were a being from a treeless planet to visit our earth and report upon what he observed of the growth of an oak, he might record that the tree developed in the same way each year—bud, leaf, flower, fruit; and that twig, branch, and bowl grew in proportion; and the roots shot out downwards and sideways, seeking, with what looked almost like intelligence, the best-suited soil. He saw no reason why it might not go on for ever while our earth could bear it. How different the fact. The oak tree has its term of life. So may species, for aught we can at present certainly say, have their term of life. But what determines it? Again, I appeal to analogy not as an argument so much as in illustration. Fairy-rings on the grass are the annular spaces on which a certain fungus grows. This fungus scatters its spores all round, but they will grow only on the virgin soil outside, and, as they will not grow where they have grown before, inside the ring the species becomes extinct.

But plants help one another. A forest creeps along the hillside and the vale, destroys the life that will not grow below it, but itself exhausts the soil, and in time perishes, having, however, renovated the soil for other plants which were kept out so long. In the four and six course farming man recognises this. Many diseases are but growths which creep across the world, feeding upon the constitutions that favour them, and then die out. Could we but destroy the seed that lingers somewhere to spread again over an earth peopled by new generations.

Shall we say, then, this is the difference? The individual has a term of life measured by the vitality inherent in himself, which cannot be wholly renovated.

The species has no limit to its life, save that imposed by its surroundings, which, however, it renders unsuitable by using up that on which its life depends. This, however, can be renewed. But will the same life be there to take advantage of the renovation? That is the question in each case.

The dying-out and migration of species thus becomes only the outward growth of the *faery-ring*.

The incoming of new species only the appearance of the wingless, colourless grasshopper in the Mammoth Cave.

The CHAIRMAN (H. Cadman Jones, Esq.): I presume I need hardly put it to the Meeting that we should return our thanks to Professor Hughes for his very interesting paper, which it has been a great pleasure to listen to. After some communications have been read, it will be open to those whose studies have lain especially in the direction of the subject taken up to commence the discussion.

Captain FRANCIS PETRIE, F.G.S. (the Honorary Secretary): Among the letters received from those unable to be present this evening are the following. The first and second are from the Duke of Argyll and Professor Hulke, F.R.S., mentioning that they have read Professor Hughes's paper with much interest, and adding that they have no criticisms to pass upon it. The third is from Sir J. William Dawson, K.C.M.G., F.R.S. :—

“McGill College, Montreal,

“March 16, 1887.

“I beg to thank you for your kind communication of an early copy of the interesting paper by my friend, Professor McKenny Hughes, on Caves. I am glad that Professor McKenny Hughes is applying his well-known acuteness and discrimination to those modern deposits which have given rise to so much somewhat crude discussion and speculation. His paper on the Drifts of the Vale of Clwyd * I regard as one of the most valuable we have recently

* *Quarterly Journal of the Geological Society*, February, 1887.

had, and especially so as placing the drifts of Wales more closely in relation with those so widely distributed in Canada, than heretofore. In the present paper he has very clearly illustrated, in the case of Ingleborough Cave, the fact that true uniformitarianism in geology includes local and occasional catastrophic action. This I regard as of the most vital importance to geological reasoning, and especially in the explanation of cavern deposits and river gravels, which, more than most other formations, are liable to be affected by violent and paroxysmal local *debacles*, as well as by apparently capricious accidental changes. The utmost caution and the most careful and minute observation are necessary in dealing with these deposits, and in estimating their ages and their relation to the human period.

"With kind regards,

"I remain, yours truly,

"J. WILLIAM DAWSON,"

"Captain Francis Petrie."

The Rev. J. Magens Mello, M.A., F.G.S. writes:—

"I am very sorry that I am unable to be present at the reading of Professor Mc Kenny Hughes's paper this evening. To the greater part of it I have nothing that I could add save in the way of corroboration from personal observations of similar instances. But I have the very strongest doubts whether there can be any trace whatever left in our caves of the Noachian Deluge, even granting that catastrophe involved our islands, which I am hardly prepared to admit. My own experience of British caves, both from observation and from reading, tends to show that the contents of, at any rate, most of them have been the gradual accumulation of a long series of years, during which they were occupied partly by beasts, partly by men, and that there is no evidence whatever to be found in them of so sudden a cataclysm as the Great Flood, the historical character of which is, however, abundantly confirmed by overwhelming proofs of various kinds."

The Rev. Dr. Walker, F.L.S., says:—

"Dun Mallard, Cricklewood,
"February 19.

"On p. 21, Professor McKenny Hughes speaks of the appearance of 'the wingless, colourless grasshopper in the mammoth cave.' I should be glad to be informed whether or not the *same* species, winged and coloured, is found outside the caves in broad daylight? If not, the inference would seem to be that the grasshopper in question had originally been created sightless, to fit it for its natural surroundings, and not have gradually become so through the unused organ being atrophied and lost. As it is inconceivable that any particular species would survive in the dark cave, and have disappeared long years since in the open air, where all the conditions for supporting and prolonging existence are so much more favourable. Lastly, short antennæ and the possession of wings are not the characteristics of *all* grasshoppers living in the light, as I can prove by species captured by myself and in my own collection."

Also a letter, just received, from Sir Charles Warren, regretting that he is unable to be present, as he had intended.

Sir WARINGTON W. SMYTH, F.R.S.—In response, sir, to your invitation, I have much pleasure in saying that I am sure the paper we have just listened to must have been a great treat to the whole of us. My friend, Mr. McKenny Hughes, the Woodwardian Professor of Geology at Cambridge, has had an unusual amount of experience in hunting up and examining caves, and I may state that, having during a series of years had opportunities of exploring several of those he has mentioned, I feel particularly indebted to him for the graphic account he has given us of a district and cave I have not seen. I shall not attempt to follow him into the difficult region into which he has been carried by the wingless grasshoppers of which he has spoken,—a part of the question which we may look upon as separated from the earlier portion of the paper. I desire only to express to him the reasons why I feel especially gratified with some of the points he has put before us in describing the modes by which caves have been formed and the manner in which they have been filled by various kinds of material. I recollect that in my earlier days of geological study I was surprised to find that a former generation of geologists—I speak especially of Professors Buckland and Sedgwick and their continental contemporaries—set very great store by the examination of caverns, and entered not only into a series of explorations, but of philosophic considerations, of a most interesting character, on this subject. Indeed, I do not know that anything more interesting can be pointed out than the work by Professor Buckland, of which Professor Hughes has reminded us,—*Reliquiæ Diluvianæ*,—although it is, doubtless, true that the theory on which he relied so much at the time he wrote that book is now very much discredited. The descriptions he gave with such admirable freshness of the different caves he visited and the facts he submitted cannot be studied by us without great advantage. I had the happiness, when a young man, of making a tour into that part of Franconia in which Dr. Buckland particularly delighted, and of seeing some caves in the neighbourhood of Muggendorf, which he made a special locality; and the impression formed in my mind coincided with his view as to the filling of the caverns in that part of the world by a succession of cave bears with the bones of animals which they had dragged in, so that in process of time they became a rich harvest to the geologist, who, on taking up the stalagmite which covered the cavern floors, found the bones of those animals embedded in it. I remember being greatly struck with a cave high up the side of the Muggendorf Valley, where it was clear that the hollow had been formed by the action of water containing carbonic acid, and that some of the bones discovered there must have come in by accident from openings above. In fact, the bones of two human beings were found in that cave underneath the chasm through which they had evidently fallen. The same thing has been impressed on me most forcibly in the district of Cross Fell, Cumberland, where, having, some few years ago, had occasion to be frequently crossing

the mountains, it happened that, being short of time, I was sometimes so pressed that, after I had left the railway at Penrith, in making my way over a place 1,000 feet high to my shooting-box on the middle of the moor, I was overtaken by darkness before I could reach home. I had observed how amenable the district was to swallow-holes. Very often, where there was only a thin covering of sandy rock, there was, at short distances from one another, a succession of caverns hollowed out of the limestone stratum, and these becoming enlarged had given way at the top and fallen in so as to leave a crater-like opening. One night, when it was pitch dark, I came suddenly upon one of these craters, and tumbling head over heels picked myself up at the bottom. I then found that I was very near a little hole through which water was trickling, and when I got to the shooting-box I found, on putting my hands in my pockets, that they were full of moss ; so that I felt sure I had had a complete capsiz. It struck me that, supposing I had broken my legs and had been left there to starve to death, my bones would probably have been carried by the water through one of the openings in the rock into a limestone cavern beneath. Thus it seemed to me that at times small bones may have been introduced into caverns through these openings above, and at others, bones of the larger animals may have got in through the chasms we find in the rocks. There is the Plymouth limestone again which often, through quarrying operations, has been the means of presenting to us the bones of lions and tigers and a number of other animals which at the present day are strangers to anything like our latitudes ; but I will not detain you by going into this branch of the subject. I may say, however, that what has been put before us in reference to the Ingleborough and other caves teaches us a very important lesson. I was rather astonished by what the author of the paper told us as to the stalagmitic floors being forced up by the action of a very heavy flood of rain water, and I cannot help seeing therein one of those difficulties that are exceedingly apt to puzzle tyros in geological inquiry. I have always felt that the examination of these caves ought to be conducted with the very greatest care and caution, and that the question of their formation and contents was a matter requiring to be dealt with by the most experienced geologists ; because, when we come to the breaking up of stalagmite floors and the bones embedded in them, it stands to reason that conclusions of the most dangerous kind may easily be arrived at far too hastily. Whether one refers to caves that are to be found on the sea-shore or to caverns met with in the inland limestone districts, there are on all sides a great many subjects to be considered in forming our conclusions. I cannot help referring to one peculiarity in regard to caves, which, perhaps, Professor Hughes has not seen, but which I have noticed in a district to the east of Ingleborough, namely, at Swaledale, in the locality of Grinton Moor, where one finds on going through the caves the joints in some of the beds are enlarged in a curious fashion. The caves there, where the miners find the most valuable lead ores, are longitudinal, and present appearances so numerous, and so

obviously showing the results of the very long continued action of subterranean streams, that one is puzzled as to what has occurred there, and at a loss to connect what is seen with those great bodies of water which may through the weathering of the limestone, have washed everything out. There no boulders are to be seen—nothing but the most beautifully fine dolomitic sand and crystallised lead ores, sometimes showing in large masses, like sides of bacon. In the Forest of Dean there are similar openings, where a valuable iron ore is found, the other materials in these caves also being almost entirely dolomitic. I should like to hear from Professor Hughes whether he has observed anything of the kind at Ingleborough. Here let me say that I think one of the most important lessons we have to learn is, the great caution that ought always to be observed in seeing that our observations are made with scientifically systematic precision; and, in the next place, in only accepting statements that are made as to these matters when they are founded on exact work of this kind, undertaken by experienced persons, well qualified to judge of the mode in which cave-openings have been formed as well as of the mode in which they have been filled.

Mr. J. STALKART.—I should like, in saying a few words on this subject, to know whether the history of the tigers and hyænas, whose remains are found in the caverns spoken of, is different from that of the tigers and hyænas now existing in different parts of the world? Ordinarily, when a tiger or hyæna kills any animal he does not drag it into a cave, but eats it where it has been seized; it is only when it has young to feed that it drags the carcase to its den. A lion does not carry its prey up a mountain side; it lies in wait near the track of the animal it kills, and there takes its fill. The hyæna might drag its prey down a hill, but would hardly drag it uphill. We know that in India these animals kill and eat their prey on the spot, only sometimes carrying their prey a short distance. They may quarrel over the remains, and drag pieces hither and thither; but, for the most part, they eat where they kill; that which they leave is chiefly the head. Suppose a bullock that has died a natural death is found: the jackals quarrel over it; a leg is drawn here, and another there, but the greater portion of the carcase is left, and the head, which they cannot gnaw, invariably remains. Therefore, I am not inclined to believe that these caves were the resort of hyænas in the manner alleged. I think we ought to inquire into the fact whether the hyænas referred to by geologists had habits differing from those of similar animals at the present day.

Mr. S. R. PATTISON, F.G.S.—I take it that the hyænas spoken of as found in caves were not only inhabitants of those recesses, but made incursions in search of prey. In Somersetshire the existence of the lion is too well attested to admit of any doubt, and the fair inference from the bones found in the caves is that they were dragged there. It is, however, by no means certain that all the hyæna and other bones found in caverns were those of animals dragged in: doubtless many of them are those of

animals that died a natural death where they are found. I am sure we ought to be thankful that Professor Hughes, during his Ingleborough explorations, was able to escape being made a martyr to science; for I can understand, having travelled those moors myself, how easily an accident of a serious nature might have occurred. As to the paper this evening, it fully bears out Professor Hughes's promise to tell us all about the operations of nature in forming and filling these rocky caves; and not only has he kept his word in this respect, but he has given us a graphic and picturesque account of the exceptional meteorological circumstances which sometimes act as factors in these transactions. With regard to the glacial period, it may be gathered that there was first of all a glacial period; then a pluvial period which has been slightly referred to as that of a Deluge; then the period in which there was the final subsidence of the land and the accumulation of modern gravels which we now behold. The controversy arises as to whether the animals whose bones are found in the caves lived before the glacial period or afterwards. What I have to say on this point is that the glacial period is really a sort of sliding scale. Its effects may have been felt at one spot and not at another at the same time, so that there must have been constant wasting at one time and place and constant accumulation at another; the result being that life may have made its appearance, and then its evidences may have been mechanically covered up by the changes. The subject is one of extreme difficulty, and I should say it is impossible, as far as dogmatic assertion goes, to say much more than this. I quite agree with Sir Warrington Smyth that these matters should be dealt with by geologists with the utmost caution, especially with regard to the conditions of life during the glacial period. With regard to the animals found in the Kentucky Cave, Professor Hughes thinks that certain of the features to which he refers in the case of those creatures have been modified by their surroundings; but the fact is that there is no trace of modification. For, as far as our knowledge goes, the features there remarked have always been the same,—the long antennæ and absence of wings in the insects he alludes to having been constant. Consequently, I cannot see the force of producing these as proofs of evolution. Then, as to the mushrooms in the fairy rings, which, it is said, are prevented from growing inside through the material being exhausted, so that there the species become extinct; I submit that the species does not become extinct. The individual dies, but not the species; and, although it may be speculated on as a theory, we have no instance of a species dying out in that way. I will not now enter into any argument upon the point, but simply claim to enter a *caveat* against it.

Mr. D. HOWARD, V.P.C.S.—It seems to me that the paper to which we have just listened is one of exceptional value, not merely on account of the inherent interest of the subject, but from the very useful and sound method of study it puts before us. It was, I think, a most fortunate accident that led

Professor Hughes to Ingleborough at the time of the great storm, the effects of which he has described, because a more accurate and valuable account of that catastrophic incident could not have been furnished. The subject is one of very great importance in many ways. The more we are struck with the continuity of causation, the more must we guard against circumstances which carry the idea too far, especially in regard to questions connected with chemistry, which afford abundant examples of the danger of carrying this theory beyond its legitimate scope. We have many examples of stalagmites forming with perfect regularity, and we assume that the process has been going on from endless time. I have twice seen the Ingleborough Cave. The first occasion was during a very wet summer, when a vast deal of water came down, not in torrents, but with a very rapid formation of stalagmite. The autumn following was very dry, and the stalagmitic formation not so rapid, and I could not help thinking how utterly impossible it must be to form anything like an accurate judgment of the speed of formation when the process was shown to be going on at two different rates. It is not merely the action of carbonic acid in the destruction of the rock that strikes one, but the wonderful way in which the solvent process goes on hollowing out the lime and disintegrating the stone, until some flood occurs and washes away vast quantities of the broken up débris. This is specially the case in the carbonated rocks, where you get a more rapid solution than in other cases; because the rock is honey-combed and cut to pieces in a wonderful manner, so that it goes to pieces with a comparatively small rush of water. Throughout the whole of this question you must bear in mind that a very slight alteration in the balance, whether of the carbonic acid produced by the surface vegetation, or in the proportion of water to carbonic acid, may make a very wide difference in the result. The presence of a little more or less silica in the water may make a vast difference in the mode in which the travertine is deposited. Any one who has had experience in connexion with steam boilers knows full well that you may have it deposited in an exceedingly hard scale if there be a sufficient amount of silica to cement it together; or, if this is not the case, it may exist as an exceedingly soft powder, which blows away directly the blow-off cock of the boiler is opened; in the same way it is not merely the percentage of carbonate of lime that is dissolved and set free by the evaporation of the carbonic acid, but whether there is sufficient cementing action going on to form a solid mass to resist the inflow of the water. One cannot help being struck with the amount of careful knowledge displayed by the author of this paper. He goes back to the most minute forms of things. This is what Lord Bacon did many years ago; but the lesson is one that has not been fully learned yet, although it is refreshing to find that it has been acquired and put in practice by Professor Hughes.

SIR WARINGTON W. SMYTH—(taking up from the table a pipe encrusted with stalagmitic deposit) asked how long it had taken to produce that result.

1 Professor HUGHES said he was unable to say.

Sir WARINGTON W. SMYTH.—I have seen a pipe as large as this filled up in two years.

Professor HUGHES then replied, saying :—A question has been raised by Sir Warington Smyth as to how the bones got into the caverns. That, question is one that ought to be asked with regard to each cave separately. There is, first, the suggestion that the bones may have been washed in from above. I have discussed this point (p. 14). Or the bones may have been carried in by animals that inhabited the caves ; and then we have to consider whether these caves were ever hyæna dens, whether the beasts of the present day behave in the same way as those whose remains are found in the caves appear to have done. Dr. Buckland found that they do. He examined carefully the bones of the animals gnawed by hyænas, and found the marks of teeth on the bones so dealt with, and that those bones which had marrow in them or some little flesh adhering to them have had splinters torn away, or are altogether broken up. Thus, it is clear, from the accumulation of evidence, that hyænas were there, and had dragged in the remains of many of the larger animals which are found lying about. In some cases we find, instead of a mass of broken bones, the bones lie whole upon the floor of the cave. This seems to have been the case where the remains of bears are found ; it is different when we have a hyæna den. It is evident that, in determining these questions, a great many things have to be taken into account. As to the way in which the carcasses are dealt with, we must remember that, when the larger animals have done with them, the smaller ones come in,—the foxes, the rats, and the mice,—all of them pulling the bones about. We trace them by the marks of their little teeth. Thus, you may find the bones drawn up into crevices into which they could not have been carried by the larger animals. Once, at Cambridge, I was shown a set of bones that ought not to have been in the gravels, from which they were said to have been obtained. I went and asked the workmen where they got them. They showed me the place, and told me they were in a sort of hole stretching from one point to another across the corner of the pit. I cleared out and examined the hole, and noticed in it a series of claw-marks, showing that the place had been used by badgers and foxes. Thus we had another example of the way by which the bones were conveyed into places where the larger animals could not have taken them nor water have washed them. Or, again, the bones may be those of animals which died in the cave—bears, for instance. In one case the bats were described as furnishing, in the shape of their own bones, a large portion of the deposit. Thus, it will be seen, we have to go from one thing to another to arrive at the true explanation. Those animals came there, lived there, and died there, and the remains of bats covered the whole of the bottom of the cave. Owls and other birds of prey also bring in remains of animals, as I pointed out in the case of Cave Ha. The same kind of thing has been noticed in America, where in the upper layers of cave-deposits are, in a number of cases, found

the pellets of owls, and lower down the bones of small animals, packing all the interstices. Therefore, it is necessary that in every case we should consider how the bones found in a particular cave got there.

Mr. STALKART.—They do not eat in caves. We find in India that the tiger will not go into a cave where he has a wilderness or jungle at hand. This is so in the case of the tigers close by the Himalayas; but another tiger, which is rather smaller, and is found on the other side of the Ganges, does go into caves, and has there been shot in the most plucky manner by British officers. If you get evidence from those caves of such a deposit of bones as has been described, then, doubtless, the inference which has been drawn will hold good. It may be that the hyænas spoken of may have gnawed the bones before they got into the caves. When a lion or tiger has killed an ox or other large animal, and sucked the blood or eaten part of the flesh, the jackals go to the carcase and finish the work, or the vultures assemble and tear it to pieces.

Professor HUGHES.—We have not found traces of the tigers behaving otherwise than according to their ordinary habits at the present time. We do, however, find remains of hyænas in the caves, and, as we are informed, the hyænas of to-day do leave their marks on the bones of the animals they eat, and other traces, just such as are found in the caves, and that, I think, is sufficient. With regard to the glacial epoch, I have confined myself to what has happened in one particular valley, and asked what is the order of events found there, for the glacial conditions found in another hemisphere can make no difference as far as this particular matter is concerned. The record of intermediate forms is exceedingly rare. If we could find in any of these caves a set of deposits representing every stage in the growth of cavern-deposits, we should possibly get all the various developments of the intermediate forms of life; but, not having these, we say that the remains we find are those of creatures which do suit their surroundings, and differ from the nearest allied forms by modifications such as might be carried out according to the laws of evolution as worked out and observed within the limits of our lives. It is one of those cases in which you have an hypothesis founded in the first place on one bit of evidence, and then supported by the comparison of that with another bit of evidence, until you get more and more data added to what was at first insufficient and the foundation of a tentative hypothesis only, and in the end you come to the conclusion that nothing but that hypothesis will fit in with all the observations made. With regard to what has been said about the fairy rings, what I meant was that the plant became locally extinct within the circle, and, if its possible area of growth were limited, and it were pushed to the margin, it might, in the same way, become totally extinct. As to species having died out, I need only mention the sea-cow, the dodo, and the auk.

Mr. PATTISON.—I did not mean it in that way.

Professor HUGHES.—Then, we are agreed. All we have to do is to show

that species do appear under such conditions, that we may say they have been modified to suit certain laws, and that they die away when the surroundings are unsuitable. As to the rate of modification, I will only mention the change in the character of shells produced by the introduction of unfavourable conditions, such as fresh or salt water, and refer to the vast mass of evidence given by Darwin, in his work on *Plants and Animals under Domestication*.

The meeting was then adjourned.

ON THE
RELATION OF FOSSIL BOTANY
TO
THEORIES OF EVOLUTION.

BY
W. P. JAMES, Esq., F.L.S.

COMMUNICATIONS, &c., FROM SIR RICHARD OWEN, K.C.B., F.R.S.
W. CARRUTHERS, Esq., F.R.S., DR. J. BRAXTON HICKS, F.R.S.,
AND OTHERS.

BEING A PAPER READ BEFORE THE VICTORIA INSTITUTE.

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RELATION OF VARIOUS FACTS

TO THE HISTORY OF THE

OF THE

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*ON THE RELATION OF FOSSIL BOTANY
TO THEORIES OF EVOLUTION.* By W. P. JAMES,
Esq., F.L.S.

1. **W**HEREVER the word Evolution comes in, it is well to begin with stating in what sense it is used. For the present purpose it will be limited to its proper biological meaning, for it is only in the province of life that it can be considered as anything more than a hazy synonym for development. What process it can possibly express in the inorganic world I am at a loss to conceive. But as understood by Zoologists and Botanists it is perfectly intelligible; to them it is equivalent to the Theory of Descent,—that is, to the hypothesis that the forms of animal and vegetable life which surround us have descended by modification from their predecessors in time. In itself this is a most interesting and fascinating question, and no thoughtful student of nature can

dream of answering it off-hand. It may be partially true or not, but the evidence at present available cannot be considered as warranting a verdict that will satisfy everybody. The solution, if solution there be, must lie in the fossil-bearing strata. If the record of those strata be accepted as hopelessly imperfect, it seems almost useless even to discuss a problem for which sufficient data are wanting. But it may be questioned whether the geological record can fairly be considered as uniformly imperfect,—at any rate, to such an extent as to preclude any inferences for or against Evolution. It is from this point of view that I propose briefly to set before the Institute the facts of Fossil Botany in their bearing upon the Theory of Descent.

2. *Divisions of the Vegetable Kingdom.*—But before entering upon the subject it will be useful briefly to indicate the principles upon which the larger groups or sub-kingdoms of the vegetable world are constituted. It would be rash to take for granted any general acquaintance with the subject, as Botany has always had less attraction for the outside public than her zoological sister; and this assertion may be extended to Fossil Botany. The extinct races of plants have no surprises for the untrained eye so great as the monstrous Ichthyosaurus or the weird Pterodactyl, no series of forms so splendid as the long array of Ammonites and Encrinurites. Some acquaintance with insignificant plants still living is required before the mind grasps the meaning of Club-mosses and Horse-tails, which reached the stature of forest trees, or understands that in their way they are as surprising as the giant Sloth or the Mastodon.

Plants are divided, in the first place, into two vast series, those with and those without flowers,—Phanerogams and Cryptogams. Old and obvious as is this distinction, it is eminently natural. Not only does it still hold good, but is, if possible, only brought out into stronger relief by our increase of knowledge. A wide gulf still yawns between the seed-bearing Phanerogam and the spore-producing Cryptogam. The assertion that it is at all affected by modern research is at variance with obvious facts. True seeds, containing an embryo plant with rudimentary axis and appendages, are strictly confined to Phanerogams, and are exclusively the result of the fertilisation of ovules by pollen-grains through the immediate agency of the air. On the other hand, fertilisation, properly so called, in Cryptogams invariably demands the presence of water, and never results in a seed. Again, the asexual spore so frequent in Cryptogams is totally absent from Phanerogams; in the fern, for instance, it is the antherozoids of the prothallus

and not the spores of the mature plant which correspond to pollen-grains. Even in the *Selaginella*, which has sexual differentiation in its microspores and macrospores, the microspores give origin still to true antherozoids requiring the intervention of water. Apart, then, from the valid mark involved in the distinction between Flowering and Flowerless plants, Phanerogams and Cryptogams may also be accurately described as air-fertilised and water-fertilised, in doing which we indicate a gap which no theory can bridge over. But when we have thus got our first great division of Cryptogams, we do not know what to do with it. It is, in fact, an unmanageable aggregate of groups separated from each other by such tremendous intervals as, for instance, that between the Diatom and the Tree-fern. The botanist is obliged to treat it as the zoologist has treated the cognate term Invertebrate, that is, to break it up into more natural series. It is a mere question of names whether these should be called sub-kingdoms or not. As to their independent value and wide divergence there is no difference of opinion. Provisionally we may establish three of these sub-kingdoms, the *Thallophytes*, *Muscinæ*, and *Pteridophytes*, or, speaking roughly, the Algal type, the Moss type, and the Fern type. First comes the *Thallophytes*, including the *Algæ*, *Fungi*, and *Lichens*, the *Characeæ* being considered as *Algæ* in deference to the preponderance of authority.

Perhaps no other division of plants includes such vast diversity in form, size, and mode of reproduction. It links the minims of the vegetable world, the Diatoms, Micro-fungi, and *Oscillatoriaceæ*, with the huge kelp of the Pacific Ocean, one of the longest stems in the present epoch. But they all agree in consisting of cellular tissue to the exclusion of fibro-vascular bundles, in the absence, more or less complete, of a differentiation into root, stem, and leaf, and in the great complexity, with few exceptions, of their reproductive processes.

Those not acquainted with natural science and more familiar with mathematical methods may consider this a very vague definition. But this difficulty is inherent in the subject. Nature, or rather living nature, abhors hard-and-fast lines. She refuses to run into our moulds, and shuts her eyes to our neat systems of classification. With reference to plants in general, there is scarcely a single statement which can be affirmed of them all without exception. We can say little more of them collectively than that they live and grow. For the fungi prevent us from predicating of *all* plants that they feed upon inorganic materials, that they contain starch, that

they break up the carbon dioxide of the atmosphere by means of chlorophyll-bearing cells, and so on.

Instead of vainly striving to cramp nature in the bonds of logic let us recognise this excessive elasticity of living forms. The late Professor Harvey has made such excellent remarks on this subject in the introduction to a book, now become rare, *Manual of the British Marine Algæ* (1849. Van Voorst), that I shall take the liberty of quoting them:—

“Whoever has paid the slightest attention to the classification of natural objects, whether plants or animals, must be aware that if we desire to follow natural principles in forming our groups,—that is, to bring together such species as resemble each other in habits, properties, and structure,—it is a vain task to attempt to define, with absolute strictness, the classes into which we are forced to combine them. At least, no effort to effect this desirable object has yet been successful But it fortunately happens that these difficulties are much more formidable on paper than in the field. The search into structure and affinities among the works of creation is something like that after first principles. We can distinguish and analyse up to a certain point; there we are stopped by that invisible and intangible, but impassable veil, behind which the Creator hides his operations. At this point we must rest satisfied with differences which we can *see*, but which we cannot *know* or *define*” (pp. ix. and x. of Introduction).

The second great group of Cryptogams is the Moss alliance. Tiny as are most of its members, they generally possess a distinct stem and leaves, and are invariably separated from Thallophytes by what is known as an alternation of generations, that is, by the occurrence of one form of the plant producing *antheridia* and *archegonia*, and of a second form arising as a peculiar result of the fertilised *archegonium*, the spore-capsule, familiar to us in *Bryaceæ* as the elegant Urn-fruit. Morphologically, this fruit is, as it were, a graft on the mother plant, and constitutes a phenomenon so isolated as to give a high value in a systematic point of view to the *Muscineæ*. Dr. Goebel, in a recent monograph on the mosses (Schenk's *Handbuck der Botanik*, vol. ii., p. 401), says:—“We must accordingly be contented with affirming that the gulf between Mosses and Pteridophytes is the deepest that we know in the vegetable kingdom, and it is not made less by being bridged over by hypotheses and surmises.”

The third great group, the Pteridophytes or Fern type, is of immense importance from its prominence in geological history. It is best divided into three classes, formed

respectively by the Ferns and their allies, Club-mosses and their allies, and the isolated Horsetails, now reduced to a single genus. In this group first occurred forms of *terrestrial* vegetation, which would now be called trees. We must lay stress upon the word *terrestrial*, for no one can now tell what glorious and luxuriant algal forests may have grown in primeval seas, without leaving a trace behind them, except amorphous masses of graphite. The Pteridophytes are also known as the Vascular Cryptogams, in opposition to the two preceding groups, which may be called Cellular Cryptogams. They possess true roots and fibro-vascular bundles, and the capacity of taking on a woody structure. Dissimilar as the outward habit of a fern, a horsetail, and a club-moss may appear at first sight, they are all connected together by the character of their prothallus. This is a kind of nurse plant or preliminary stage, in which a cellular expansion arises from the germinating spore, and in time produces the *antheridia* and *archegonia*. From the fertilised *archegonium* springs the form which we call, in ordinary language, the fern or the horsetail, and this form, in its turn, gives rise exclusively to asexual spores. In the small group of Heterospores the extension and duration of the prothallus are so abbreviated that the two kinds of spores, the microspores and macrospores, approach in function very near to pollen-grains and ovules. But to the last antherozoids occur, and require water : a mark distinguishing the highest Heterospore from Phanerogams.

Advancing now to Flowering plants, we have the advantage of being able to appeal to common knowledge. Everybody has some notion of a flower and its parts. The sub-kingdom of Phanerogams is divided into two classes, of equal systematic importance, but very unequal in extent. Here, as in earlier instances, we must distinctly bear in mind that the vegetation of the present epoch is only a temporary phase of the development of plant-life. Palæontology teaches us that classes now small in extent were once more important, and it is only by taking a broad view of past as well as of present life that we understand the relative value of the higher groups. In natural as well as in political history the present has its roots in the past, and is now determining the future. It is thus with the two classes of Phanerogams, Gymnosperms and Angiosperms. If we considered only the actual state of affairs, the Gymnosperms would appear to be what they were considered in pre-geological times, a subordinate group. But when we know that they date as far back as the Devonian beds, we see their importance in the great plan of creation. The Gymnosperms

include the Conifers, the Cycads, and *Gnetaceæ*. Their flower is a true flower, but of a very simple type: a perianth is nearly always wanting, the sexes are always separate, the floral axis is often a real shoot and sometimes even branched, and finally the ovules are not contained in an ovary. The woody stem, however, of the Conifers is of a higher type than anything we have yet met with, having annual rings of growth and a distinct bark. It is usually said to approach the dicotyledonous type, but as it is incomparably the older, it would be more strictly correct to say that the dicotyledonous type represented by our oaks and elms is a more highly differentiated form of the gymnospermic. Lastly, we have the Angiosperms, in which the ovules are enclosed in an ovary. They are divided into Monocotyledons and Dicotyledons, and comprise all the familiar flowers, shrubs, and trees which surround us, and on which we need dwell no further.

3. *General Inference from Fossil Plants*.—The order in which we have taken these four groups is that of their respective simplicity, Thallophytes, Muscineæ, Vascular Cryptogams, Phanerogams. As far as the evidence of the rocks goes, it is also, on the whole, that of their first appearance in past time. To speak quite exactly, the remains have been found as follows:—Algæ are the earliest; Vascular Cryptogams then appear in company with Gymnosperms and a few Monocotyledons; then comes the culmination of the Gymnosperms in the Cycads; finally, the Dicotyledons emerge abruptly in the upper chalk. Fungi lichens and mosses are too soft to stand any chance of being preserved in the older rocks. So far then, as the record goes, it agrees with the natural arrangement given above. Now the Theory of Descent requires that the varied plants of the present epoch, trees, shrubs, and herbs, ferns, mosses, and seaweeds, should all alike be lineally descended from the algæ of the most remote age, and, moreover, ultimately from the simplest forms of the algæ, the *Oscillatoriaceæ*, which alone, as far as our knowledge goes, can live in hot water, and could, consequently, have flourished in the half-boiling ocean of the dim past. The rocks, accordingly, should present us with a series, more or less complete, of these supposed ancestors of existing plants. Is this the case? To this question there is only one answer. Had we to consider only the fossil plants of the rocks, so far as known, no one in his senses would have been led to such an hypothesis. It would never have suggested itself to a botanist. No transitional forms are known between Algæ and Mosses, between Mosses and Vascular Cryptogams, between Vascular Cryptogams and Phanerogams. Even if such links were found

they would prove nothing as to their origin. The only fossil evidence that can prove that one species has been transmuted into another would be a vast number of intermediate forms *between two species*, shading off imperceptibly into one another. It is a matter of common knowledge that such a series is not yielded by the rocks. So tremendous is the force of this negative answer at first sight that it requires some very strong counter arguments to rebut it.

4. *Imperfection of the Record.*—As is well known the evolutionist's reply is to dwell upon the undoubted imperfection of the record. He can, for instance, very fairly say that as no mosses have been preserved before the chalk, a great series of intermediate links between algæ and mosses *may* have perished. Similar remarks apply to the lichens, fungi, and many other lowly plants. Who knows, he may say, what the lost pages of the great Stone book may have contained? Intermediate forms would naturally be humble, insignificant plants, and it is not surprising that they have not been preserved. There is something in this, and we would wish it to carry its full weight to the hearer's mind. Are we then to leave the question entirely open as far as fossil botany is concerned?

5. *Occasional Completeness of the Record.*—The best answer to this seems to be that whilst admitting the general incompleteness of the fossil history of past life, we must take care not to exaggerate it. For we cannot deny that here and there, at any rate, we have isolated pages, to continue our metaphor, which are crowded with illustrations. One of these occurs in each of the three great divisions of geologic time: in the Kainozoic we have some singularly complete memorials of Miocene date; in the Mesozoic we find similar though less abundant representatives of the cretaceous land-flora; and, finally, in the Palæozoic we have the confessedly rich remains of the coal measures. Surely, if it can be shown that each of these extinct floras is wonderfully illustrated in local strata, we shall be justified in drawing all the inferences we can from them. Three times the veil is withdrawn from the past, and three times we catch a glimpse of the character of the rich and beautiful vegetation then flourishing.

6. *Miocene Flora.*—In speaking of the Miocene Flora it will not be necessary to repeat the information on the subject to be found in all the accessible books on geology. Every one who has read Lyell's *Principles*, or even the briefer *Student's Elements*, will remember how fascinating the subject is. It is impossible here to attempt to separate the various subdivisions of Miocene time; we must confine ourselves to the

general bearing of the whole epoch on Evolution so far as its plant-remains go. The most beautiful leaf-beds belong to the Upper Miocene, and are best seen at Oeningen, in the valley of the Rhine, between Constance and Schaffhausen. They have been explored by the late Professor Heer, whose noble work on the Tertiary Flora of Switzerland will form an imperishable monument to his name. At this spot there seems to have been a lake, probably fed by springs with water unusually charged with carbonate of lime. Along the margin of this lake a series of very fine marls were deposited, often as thinly laminated as the pages of a book. In these strata an astonishing number of leaves, fruits, and insects have been preserved. A small collection of them is to be seen at the British Museum, now in South Kensington. To give some idea of the completeness of the record for this particular epoch, it may be pointed out that of a kind of camphor-tree (*Prinos Lavateri*) distinct sprays are found with flowers, fruit, and leaves; that the well-known key-fruit of the maple abounds, together with countless leaves; that on some remains leaf-fungi can be detected just as they now are developed in autumn; and that the time of year when the deposit was made can often be inferred from the shoot being in its vernal or autumnal state, and from the ants having their wings or not. What, then, was the vegetation that surrounded this Swiss lake at a time before the Alps had undergone their last elevation? First of all, not one plant of the present Swiss flora has been found. Secondly, the vegetation was very rich in trees, and on the whole had a resemblance to that of Florida, Mexico, Australia, and Japan. The number of woody plants was very great for so small an area. About 180 are known. These include swamp cypresses, evergreen oaks, laurels, elms, maples, acacias, liquidambar, and seven kinds of palms, including one (*Sabal*) similar to that now growing in the valley of the Mississippi. On the surface of the lake floated water-lilies, around its margin were reeds and rushes. The ferns are precisely the same as our recent ones, only of a sub-tropical type, such as *Lygodium* a climbing fern, and *Osmunda lignitum*. But it would be tedious to give anything like a complete list of the still-existing genera which are found in these strata. Every one who examines the remains must be forcibly struck by the extreme distinctness of the generic type; for, great as must be the interval which separates us from these successive Miocene floras, all the genera are obviously as distinct from each other then as now.

More than this, so great is the constancy of type in many cases that Professor Heer gives a list of plants in which

probably the same species have survived to our own times. He considers seventy-two plants as probably ancestral forms actually identical with those now living. The following are some of them :—

MIocene FORM.		MODERN FORM.
Woodwardia Rössneria	=	W. radicans (a Madeira fern).
Aspidium Escheri	=	A. thelypteris (a marsh fern).
Isoetes Braunii	=	I. lacustris (common water-plant).
Taxodium dubium	=	T. distichum (American swamp-cypress)
Glyptostrobus europæus	=	G. heterophyllus (Chinese cypress).
Sequoia Langsdorffii	=	S. sempervirens (redwood).
Sparganium valdense	=	S. ramosum (common water-plant).
Liquidambar europæum	=	L. styracifluum (American shrub).
Populus mutabilis	=	P. euphratica (Asiatic poplar).
——— balsamoides	=	P. balsamifera } American poplars.
——— latior	=	P. monilifera }
Salix varians	=	S. fragilis (common crack willow).
Ulmus Braunii	=	U. ciliata (elm).
Planera ungeri	=	P. Richardi (tree allied to the elms).
Platanus aceroides	=	P. occidentalis (plane-tree).
Laurus princeps	=	L. canariensis (laurel of Canary Islands).
Hakea salicina	=	H. saligna (Australian proteaceous tree).
Diospyros brachysepala	=	D. lotus (kind of ebony-tree).

Besides these his list includes also the direct ancestors of three species of maples, of the tulip-tree, and so on. This extraordinary permanence of generic, and possibly even of specific type, is strongly opposed to any theory of variation. If genera, and possibly species, have changed so little in so vast a time there really is no room for the slow and secular transformation required by the Theory of Descent. Let no one underrate the value of this kind of evidence founded on leaves and flowers. The microscope is now able to decide points of affinity in plants to an extent never dreamed of in the earlier days of palæontology. The cells of the epidermis, with their shape and arrangement, and the stomates which pierce it with their characteristic forms, are often sufficiently preserved in Miocene leaves to indicate the order, if not the genus, of a mere fragment.

But there is another point of view from which the persistence of these genera is very striking. They have outlived a most remarkable change in the climate of Spitzbergen and Greenland. Genera of plants are still living in the warm temperate zone which once flourished within the present Arctic circle. This is well known as one of the greatest puzzles in geology; but I am not now concerned with its solution. I am only pointing out that beeches, oaks, planes, poplars, and so on, are older than that extraordinary condition of our planet which allowed a vigorous growth of

trees to take place within 12° of the pole. All the Arctic Miocene plants agree entirely with those of the Miocene beds of Central Europe. But this even is not all. Many of the genera found in the Miocene flora go further back still. They meet us in the chalk, the earliest flora of Dicotyledons. Dr. Lesquereux gives, in the *Cretaceous Flora of the Western Territories* (vol. vi. of U. S. Geological Survey, 1874), amongst others the following genera of trees as then existing: the alder, the birch, the oak, the laurel, the magnolia, the plane-tree, the willow, the sassafras, the sequoia, the tulip-tree. With pardonable pride the eminent American palæo-botanist remarks upon the great antiquity of the indigenous glories of the American woods, the magnolia and the tulip-tree. He justly remarks,—“The magnolia, and its relative, the tulip-tree, are wonders of American nature quite as worthy admiration as the great Niagara or the mammoth trees of California” (*Tertiary Flora*, vol. vii., p. 247). But after describing fragments of tulip-tree leaves from the cretaceous beds he makes the following most valuable remarks (*Cretaceous Flora*, vol. vi., p. 124):—“*Liriodendron*, the tulip-tree, has in its characters, its distribution, and its life a great degree of affinity with magnolia. The American species is the only one known now in the vegetable world, and its habitat is strictly limited to this country. It does not ascend higher than the fortieth degree of latitude, except, perhaps, casually, like magnolia, under the protection of favourable local circumstances. The genus does not appear to have any disposition to modifications of its type, and to migrations. We have as yet scarcely any fossil remains of it in our Tertiary formations. In that of Europe, it is represented from Greenland to Italy by one species only. The leaves of different forms, described from the Dakota group as four species, may perhaps be referable to a single one, as the characters, especially the size, of the leaves may be local, and result from climatic circumstances. It has thus passed a solitary life. Even now, by the singular and exclusive form of its pale-green glossy leaves (*i.e.*, four-lobed and looking as if the fifth apical lobe had been cut off, apparently a unique outline); by its large cup-shaped yellow flowers, from which it has received its specific name; by its smooth, exactly cylindrical stem, gracefully bearing an oblong pyramidal head of branches, grouped with perfect symmetry, it stands widely apart from the other denizens of our forests as a beautiful stranger, or rather as a memorial monument of another vegetable world. Either considered in its whole or in its separate characters, the tulip-tree is a universal and constant subject of admiration and wonder. It could be named,—not the king, it is not strong

enough for that,—but the queen of our forests, if the magnolia was not there with it to dispute the prize of perfection by the still grander majesty of its stature, the larger size of its foliage, the elegance and the perfume of its flowers. Our sense of admiration for these noble trees is heightened still by the dignity of their ancient origin.”

Now we have heard a great deal lately about the variability of species. Whole books have been written to prove the very obvious proposition that plants and animals if placed under artificial conditions are likely to vary in an artificial manner. We have had enough of this one-sided collection of facts favourable to certain hypotheses. It is time also to say something about the permanence of type to be found in nature. That there is something stable and fixed amidst all the variation of living things is absolutely certain. To pass over species, it is undoubtedly true that many genera are extraordinarily stable, as we have seen to be the case with the maple, the oak, the tulip-tree, and so on, persisting from the chalk. But an illustration from the floras of distant lands in the present day will, perhaps, help us in another way to realise the astonishing constancy of some generic types. Suppose we take ship and get away as far as ever we can from our own island, we shall find ourselves at last amid the waste waters of the vast Pacific Ocean. Among these stormy waves rise almost at our antipodes the small islands known as Lord Auckland's group and Campbell's Island, visited by the present Sir J. Dalton Hooker during the Antarctic expedition of the *Erebus* and *Terror* under Sir James Ross, which lasted from 1839 to 1843. Lord Auckland's group lies in 50° 30' S. lat. and 160 E. long.; Campbell's Island in 52° 30' S. lat. and 169 E. long. If we consult the magnificent *Flora Antarctica*, and gaze at the beautiful coloured portraits of the plants executed by the skilful hand of Mr. Fitch, we shall almost imagine ourselves landing upon these steep and desolate islands, formed of volcanic rock, “ever lashed by heavy swells and exposed to a succession of westerly gales.” Still, in spite of rain and snow and fog, these lonely spots produce a flora rich in beautiful plants, a fact attributed by Sir J. D. Hooker to the comparative mildness and uniformity of their oceanic climate. However, what we wish at present to call attention to is the constancy of generic type. Any novice in botany whilst exploring these lands would be able to name off-hand plant after plant as belonging to genera familiar to him in Great Britain. Nor would this be true only of these islets, but also of all the other fragments of Antarctic land, such as Kerguelen's Land, Falkland Islands, and so on.

We do not say that *most* of the genera are European, but in each island there are *some* genera identical with those of Europe. Our imaginary traveller would at once know the species of *Ranunculus* from their leaves, flowers, fruit, and general habit. He would find *Cardamine hirsuta*, var. *sub-carnosa*, only differing from our common hairy Bitter Cress, to be found on any old walls, by its very fleshy leaves. He would see a *Geranium* (*microphyllum*), extremely like our *G. lucidum*, two or three kinds of *Epilobium* or willow-herb, two lovely kinds of scorpion-grass (*Myosotis*), all of which would be familiar to him in a moment as new forms of well-known types.

It does not require a botanist to detect them: any sharp, country-bred lad would say in a moment, "This is a buttercup, that is codlins-and-cream" (the provincial name of *Epilobium*), and so on. It would be wearisome to go through all the European genera that thus reappear in Antarctic lands. I will briefly add two barberries, a ragwort, a cudweed, our own dandelion identical in species, lovely gentians, a butterwort in the Falkland Islands scarcely to be distinguished from *Pinguicula lusitanica* our own pale butterwort, a great many grasses, some ferns, very many mosses, fungi, and algæ.

This is merely introduced as a single instance of a phenomenon that must be taken into account, the extension of many genera through widely-separated areas, and their astonishing constancy to their type. Let this fact be remembered as well as those of the variability of species. We have, in reality, two series of facts in living nature, some pointing to change and some to persistence, and our task is to reconcile them. It is certainly singular that often where the species are most unsatisfactory, as in the willows, the genus is, on the contrary, eminently natural; and, as we know in this case, it is also a very ancient one, descended from the chalk. Again, where the genera are intricate, the order is wonderfully natural, as in the *Umbelliferae* and *Compositæ*. However, enough, perhaps, has been said about this subject, and we will proceed to the Chalk Flora.

7. *Cretaceous Flora*. — We have already spoken of the antiquity of the genera of dicotyledonous trees which first occur in these beds. — We will now confine ourselves to one single point,—their abrupt appearance. It is generally admitted that, as far as our knowledge goes, the Dicotyledons emerge suddenly in the upper chalk, without any previous hint of them in the preceding Jurassic beds, which were especially rich in cycads and ferns, and they occur, moreover, as representatives of the three great divisions,—*Apetalæ*,

Monopetalæ, and *Polypetalæ*. The first that we can find are, to use Dr. Carruther's words, "not generalised types, but differentiated forms, which, during the intervening epochs, have not developed even into higher generic groups."

To take, for instance, the Dakota group in North America, among its 130 species, as yet known, only one may be doubtfully referred to the Cycads; there are only five Cryptogams, six Conifers, and two Monocotyledons; all the rest are Dicotyledons, distributed into genera, much as now; of *Apetalæ* it has *Amentaceæ*, *Myricaceæ*, *Platanææ*, *Salicineæ*; of *Gamopetalæ*, *Bicornes*, *Ebenaceæ*, &c.; of *Polypetalæ*, *Magnoliaceæ*, *Sapindaceæ*, *Menispermaceæ*, &c. As Dr. Lesquereux says (*Cretaceous Flora*, p. 38):—"It has representatives of all the classes of plants, without disproportion, in one degree or the other, as compared to what is considered the scale of the vegetable kingdom. This seems to prove a collateral development of different primitive types, and, therefore, the appearance at certain epochs of those original forms which, at each geological period, have changed the character of the vegetable world, and which do not have any connexion with antecedent types." Again, still more decidedly (p. 35), after remarking that it is easy to build up imaginary systems of derivation from supposed simple types, by mere deviations or multiplications of organs, he goes on:—"But until we know more we have to consider the facts. And the conclusion evidently forced, at least in considering the flora of the Dakota group, is that its disconnexion from ancient types is so wide that even the supposition of intermediate, unknown, extinct vegetable types fails to account for the origination of its peculiar characters."

So far as the evidence of the Upper Cretaceous Dicotyledonous remains goes, it is decidedly opposed to the theory of descent. It is opposed to it in two ways. First, by the sudden emergence of the class already differentiated into subgroups it irresistibly suggests some abrupt origin of that class, such as immediate creation. Secondly, by the proof of the persistence of generic types so complicated as that of the tulip-tree from that distant period to the present day without any apparent change, it negatives any theory which is built upon the indefinite variability of systematic characters.

8. *The Flora of the Coal Measures*.—We now come to the most fascinating of all the extinct floras, that of the Palæozoic Coal Measures. The imagination is wonderfully attracted by the picture which science calls up of these old-world forests. Stretching for hundreds of miles along the swampy margins of estuaries, and covering the surface of their low deltas, they

appear to have been uniform all over the world, even as near the pole as Spitzbergen. Club-mosses and horsetails were trees in bulk and stature, though ungainly to our eyes with their angular forked branching, their spiral rows of stiff leaves, and their grotesque fructification. Mingled with these interesting though unlovely exaggerations were the beautiful lace-like fronds of tree-ferns, as well as a thick carpet of the lowlier species, and also scattered Cycads and Conifers. No birds built their nests in this monotonous jungle, no bees or butterflies lighted up a world destitute of colour and fragrance. But life was, nevertheless, abundant in these thickets, though of an unattractive kind, molluscs and myriapods, and wood-boring beetles. Now, the first thing that strikes us in examining the fossil remains of this flora is the extraordinary abundance and perfection of the impressions of ferns. Their state of preservation is often marvellous. It should be remembered also by those who only see them in cabinets that those collected are but a fraction of those noticed by the observant naturalist. Very often the shale in which they lie buried is so brittle that the collector only catches a passing glimpse of a lovely impression before the matrix crumbles to pieces as he tries to grasp it. It seems impossible in the face of this abundance of remains to deny that at any rate we have here a fairly complete record of local floras. So far as it goes it can be trusted. As the date of the palæozoic coal measures must in any case be very remote, they evidently supply us with a crucial test for the Theory of Descent. If that theory were true, the lines of vegetable pedigree should be at that time visibly converging. For instance, the three great classes of Vascular Cryptogams ought to be far nearer to each other then than they are now. Is this the case? Notoriously the answer is in the negative. Ferns, horsetails, and club-mosses are not only not converging, but are, if anything, further removed from each other than now. The two latter groups then reached their culminating point both in the size of individuals, the number of genera, and the complexity of structure. The *Lepidodendrons* and *Sigillarias* had a kind of woody structure feebly represented in their present herbaceous representatives. So also had the huge *Calamites*, *Calamodendrons*, and *Equisetites* which have now dwindled down to a solitary genus *Equisetum*. The peculiar spores of many of the fossil genera are found in vast abundance, and proclaim unmistakably their affinity to the modern survivals.

The ferns still flourish, but at that period they were evidently of greater relative importance than now. At present about forty species grow in the British Islands, but

130 fossil species have been found in the coal shale in the same area. Dr. Carruthers also tells us that a group of ferns has entirely passed away with a stem-structure fundamentally different from any now in existence. All these distinctions are equally prominent in the still older Devonian remains. So far back as we can trace the three great groups of Vascular Cryptogams they move in parallel and not in converging lines. The importance of this fact is so enormous that it seems to dispose of the question for ever; for there is really not time enough left before the Devonian beds to allow a primitive cryptogamic form to vary into three such strongly-marked and highly specialised groups of descendants. Then, again, as Lyell remarks, it is astonishing how little ferns have altered since their first appearance, so that possibly even the genus *Pteris* is a survival from the carboniferous age. If they have varied so little during such an enormous period of time, why should they be supposed to have varied immensely just before the commencement of that time? And is it not a singular fact that all the remains which would support the theory of the derivation of the three groups from an older form have been lost?

The same story is told by the other vegetable remains of the coal measures: thus the Conifers are represented by the *Taxineæ*, or Yew alliance, a highly specialised form. For the present the opponent of the Theory of Descent may take up an impregnable position behind his fortress of coal.

9. *Do Synthetic Types prove Evolution?*—Synthetic types, *i. e.*, those which are supposed to combine the characteristics of separate orders or classes, are considered by many as a proof of Evolution. Let us bring this assumption to the test of fact. I suppose the Cycads are a synthetic type. They resemble ferns in the circinate vernation of the leaves and in the sorus-like aggregation of pollen-sacs; in their dioecious, entirely naked flowers, crowded into cones, they partly resemble Conifers and partly Equiseta. In the processes of germination they resemble the higher Vascular Cryptogams. In their general habit they are like Palms. Here, I imagine, we have what is usually called a synthetic type. Now, according to the Theory of Descent it ought to have been prior in time to the Ferns, Conifers, and Palms, the characteristics of which it combines. As a matter of fact it is later than Ferns and Conifers. We ought, according to theory, to trace a series of diverging forms starting from it. As a matter of fact, we find it an isolated group throughout all its existence. We see the first scattered indications of its coming

in the coal measures, but it is especially in the oolite and other mesozoic strata that it culminates, and then it dwindles away until the present epoch, when it still flourishes in about fifty species, distributed under seven genera. Such is the life history of a synthetic type, and it is no wonder that evolutionists say very little about it.

10. *Conclusion*.—No fossil botanist had a profounder knowledge of the vast Tertiary flora than Dr. Heer of Zurich. On such a subject as this I cannot close my paper better than with his striking remarks at the end of his fascinating book *On the Primeval World of Switzerland* :—

“The deeper we penetrate into the knowledge of nature the more thorough becomes our conviction that only the belief in an Almighty and all-wise Creator who has made Heaven and Earth after an eternally predetermined plan can solve the riddle of nature as well as those of human life.”

NOTE.—The author must state his obligations throughout the paper to Mr. Carruthers's Presidential Address to the Geologists' Association, as reported in the *Geological Magazine*, 1876, p. 560.

Count Saprota's attempt to weaken the argument from the carboniferous flora is hardly successful; indeed, his chapter on Evolution in his interesting book on Fossil Plants is too obviously a *rechauffé* of an article in the *Revue des Deux Mondes*, and hardly does justice to the scientific eminence of that patient investigator of the Aix Cretaceous Flora.

The CHAIRMAN (D. HOWARD, Esq., F.I.C.).—We have to thank Mr. James for his most interesting paper, which is well worthy of our careful attention. (Applause.) It would appear, from the course of his varied remarks, that in dealing with the whole question of evolution it is, first of all, necessary that we should make up our minds as to what we mean by "evolution." If we simply mean that there is in nature a plan of development, we must, I think, accept that as a self-evident truth. In point of fact, the word "evolution" is often used with the same vagueness that is characteristic of the way in which we employ the word "affinity" in chemistry in order to express the tendency to combine, which is evidenced by two substances that are related as little as possible to each other. In a similar way, the term "development" is frequently used to express almost anything in the world except that which, grammatically or logically, is meant by that word. But when we come to consider the question of development, with reference to what is commonly assumed to be the case—namely, that the differentiations of nature have taken place by a slow and gradual process continually going on at approximately the same rate, investigations such as those which have been conducted by Mr. James become invaluable as arguments for or against the evolution theory. The whole study of botany is most fascinating, and one cannot but wish that Mr. James had had time to have worked out some of the points he has touched upon more fully than he has been able to do within the limits of this paper. I may just allude to one feature which to me is very striking in the study of botany, and that is, the amazing development of structure evidenced in some of the elementary forms of plant life. A good many people know a mushroom when they see it; but how many are there who know anything of the life-history of that plant? Its apparently simple structure and spontaneous growth are familiar to all of us; but how many have the least knowledge of the elaboration of structure or the extraordinary complexity of the stages of development through which it goes? In a vague kind of way, we know something about a certain object which goes by the name of mushroom spawn; but very few of us know anything of the real bearings of that spawn on the developed plant, or of the different phases through which it has had to pass. And, if this be true in regard to so simple a form of plant life, with how much greater force does it apply to the more elaborate forms? I may say, also, that the fact which Mr. James has pointed out, that the extremely complex processes of reproduction which are noticed in plant life at the present day are to be found presenting exactly the same characteristics in the earliest forms of the great divisions of the natural orders of plants, as shown in the very earliest appearances they evidence in the record of the rocks, is one which it behoves those who believe in the theory of regular evolution to explain, before they call upon us to assume that that theory is proved. (Applause.) Here, in the plant world, we have not merely the great divisions of nature just as widely separated in the earliest appearances found in fossil remains as they

are at the present time, and with no intermediate links, but we find special genera, just as distinct from the other genera as their descendants or present representatives are from the different genera which are nowadays found on the earth. For instance, we cannot for a moment doubt, when we regard the first appearance afforded us of the tulip-tree, that in it we recognise the same tulip-tree as now exists, just as we also recognise in the stupendous lizards of the past the same type of lizards we see now. No one doubts that the creatures whose fossil remains we find were lizards. Even the uncultivated countryman, or those not so learned as the countryman in objects of natural history, would recognise the essential characteristics of the early tulip-tree. Do any of us who grow roses know how impossible it is to classify roses? In this case we have a singularly plastic genus, capable of cultivation into almost infinite varieties, and yet the result is always a rose. We never find a rose developing into anything other than a rose, and yet, within the limits of variation, the variety is almost infinite. If there were no strict lines within which nature is confined, why should not all species of plants be simply varieties of one original, such as we see in the case of the rose? and why should there not be intermediate links which are now absent? It is only by the familiar study of plants that we are able to appreciate the force of this argument; but the argument, in its main outlines, appears to me to be one which any person who knows anything of nature may readily follow, and one also which it would be well to pursue, not merely to the extent to which this paper carries it, but even further, in order that we may be the better able to understand the marvels of creation; for it is evident that nothing but a creative power could have caused the differentiations we see around us. If it be said of evolution that it has taken place very rapidly at one period, and very slowly at another,—that, in point of fact, it has proceeded by fits and starts,—we may very fairly exclaim, That is quite another matter; and here I would broadly say that, if this is what is meant, then we may assert that evolution is simply claimed as a form of creation which as much requires the exercise of a creative power as any other form of creation. It is impossible for us to consider in what forms creative energy can be exhibited, or to limit its possibilities but such an evolution as this undoubtedly demands a creative energy just as much as is needed by any form of belief in creative power. In saying this, I must not be supposed to deny that, even if the gradual process of evolution were proved, it would just as much require creative energy to account for it as is needed by any other form of creative power. The result is that, do what they will, the evolutionists are utterly unable to escape from the necessity of a Creator; and, therefore, the question is not a vital one for the theist. I will conclude by saying that, in the interests of truth and sound knowledge, papers like this are invaluable as a means of bringing to book those modern theories which are very popularly expounded, but which it is found very difficult accurately to prove. (Applause.)

Captain FRANCIS PETRIE, F.G.S. (Hon. Secretary).—Before this discussion

commences, I have to read two letters, their writers being unable to be present; the first is from Sir Richard Owen, K.C.B., F.R.S.

“Sheen Lodge, Richmond Park, East Sheen, *March 14, 1885.*

“DEAR SIR,—I have the honour to return my best respects and thanks to the Council of the Victoria Institute, and regret that my present state of health forbids me to quit the house.

“The ‘Unrevised Proof,’ which I now return, has enabled me to pass a most interesting and instructive hour with the accomplished author of the ‘Relations of Fossil Botany to the Theories of Evolution.’

“I much regret that I cannot listen to the Paper and to the Discussion it will occasion. I shall deem it a favour to have a copy, when issued.—Believe me, faithfully yours,

RICHARD OWEN.

“Captain Francis Petrie.”

The second communication is from J. Braxton Hicks, Esq., M.D., F.R.S., who would have been present but for a severe cold. He says:—

“The lines followed by the author of this paper seem to be excellent, and with the introductory remarks I quite agree. The great question of Evolution is not yet settled; far from it; probably it never will be absolutely proved; at any rate, until it is so, opinions on it can only be formed on probabilities; and the relative value of these can only be arrived at by examining facts, bearing on the question, with the thoroughness and patience shown by the author of the *Origin of Species*. Till this is accomplished, and it is a great work, and till every point on either side, be carefully balanced, it will be considered that his conclusions have not been answered. The argument based on the imperfection of the geological records obviously cuts both ways; like as it enables the evolutionist to escape from the demand for demonstration of the transitional forms, so it also enables his opponent to claim that the absence of any ancestor identical with existing species is no proof of its never having existed. And here the argument of Mr. James comes fairly in, and shows that where the records of the past are copiously revealed, there is a persistence of species and genera, remarkable on the theory that a constant slow change is always occurring.—Most of those who have advocated the theory of evolution, have, so it appears to me, jumped to conclusions not warranted by the evidence; and then, having treated possibilities as proved facts, have overlooked what can be said on the other side, being carried away by the enthusiasm engendered by the apparent squaring of the theory with the facts observed. By this and kindred actions a hasty and spurious philosophy has taken the place of the former painstaking inquiry after knowledge; and thus true philosophy is discredited. Had all the work on this subject been brought forward as ‘contributions,’ and not as final conclusions, we should have advanced sooner towards the solution of the question. To state, as some have done, that the subject is settled, and that all who dissent are the reverse of acute, shows an inadequate conception of the difficult problem before us.”

Mr. W. CARRUTHERS, F.R.S.—I have to express the pleasure with which I first read and have just listened to Mr. James’s paper, in which I think he has very clearly stated the case he desires to establish. I have but little to offer in the shape of criticism, and still less by way of supplement. I accept, to a great extent, what Mr. James has put before us as a concise

statement of the evidence to be derived from plants in relation to theories of evolution. There are, perhaps, one or two slips which I might correct, but they are not of more importance than typographical errors, and are, at the most, very slight. I think he has done well to insist on the permanence of generic, and, perhaps, even of specific types ; because this is what really lies at the root of the whole question. I have traced some species as far back as the glacial period—species that are now living on this globe, but which belong not only to highly-organised plants, but to the lower cellular plants, and about which there cannot be the slightest doubt. This, of course, demands a very long time indeed for the development—if they were developed—of the existent species ; but when we go back, as Mr. James has taken us, to the origin of the various types of plant life, and see that the dicotyledonous plants made their appearance, as far as we know—and, of course, we cannot argue beyond the extent of our knowledge—in the upper cretaceous beds, that they then suddenly presented themselves in a large number of forms representing all the main sections of this division of the vegetable kingdom, and that their remains can all be referred to existing generic types, it seems to me to be utterly impossible that any explanation can be given that can bear out the theory of evolution by genetic descent. This remark is, I think, equally true with regard to the lower divisions. I think Mr. James has put the position he has taken very clearly in regard to the vascular cryptogams in the coal measures. That those three forms, so widely separated from each other, even in those early times, should have continued to exist and to maintain their differences of character down to the present time, is, I think, a fact which is strongly opposed to the evolution theory. I am, however, only expressing my general belief in the strength of Mr. James's arguments. I might, perhaps, object to the point he makes as to the synthetic types. For my own part, I am not acquainted with a single synthetic type in the vegetable kingdom. I do not know any plant that has been discovered in the rocks of the earth containing a synthetic structure including the characters of several groups of plants, now differentiated ; and I am sure that this is not the case with the cycads, which, while they have an anomalous appearance in relation to their allies, are a distinctly-separate type of gymnosperms, with no affinity to the ferns on the one hand, or to the palms on the other. They began life as a group in the secondary strata, and fossils which have been referred by early observers to this group of plants have been shown to be not stems of cycads but of vascular cryptogams. They appeared to form a large portion of the flora of the secondary period, and there were some types which have disappeared entirely and are not found at the present day. I would only, before sitting down, express my gratification at the clear way in which Mr. James has put the question before this Institute, and my conviction that all the data we have in connexion with fossil botany appear to me clearly to disprove, and certainly in no way whatever to support, the hypothesis of evolution by genetic descent. (Applause.)

MR. C. HASTINGS DENT, F.L.S.—I think that papers like the present are especially valuable as bringing forward some of the weak points of the theory of evolution. Although I have not done more than look into fossil botany, it is very closely allied with zoological studies, which have always had great interest for me. There is one point to which I should like to refer, namely, the sudden appearance of groups of families in the geological strata, which appear to form a powerful argument against the doctrine of evolution. It is, I think, particularly noteworthy when we find the representatives of the same genera existing in a similar condition at the present day. Professor Williamson, stated in *Nature* in the winter of 1881-2, that he thought it doubtful whether it was possible to make clear the process by which the evolution of phanerogams from cryptogams has been accomplished. Darwin, perhaps, would give two general types—one for phanerogams and one for cryptogams. Here we have two types separated by a vast amount of time—two separate creations; and it may be asked, if there are two, why not a hundred? I would say a word as to the persistence of type, and another with regard to the persistence of species. In reference to the persistence of type, there is the small equisetum (*E. sylvaticum*) occurring contiguous to or in the soil overlying the coal measures, and is found only in such localities, flowering in June and July. It is plentiful in the neighbourhood of Manchester, where it may be found growing in the cloughs and valleys of the coal district. Then, as to the persistence of species, there is the *Salix herbacea*, which I first found on the summit of Snowdon, and afterwards, on a visit to the Lake District, upon the tops of Mount Skiddaw and Scawfell Pike, though I failed to find it on Helvellyn. All these mountains are something over three thousand feet in height. It occurs to me that this plant is a survival from the glacial epoch, and that, as the temperature of the British Isles has increased, this little willow, which is the smallest known species, and only attains a height of two or three inches, gradually found its way from the increasingly warm low ground until it is now isolated on the tops of the highest peaks. A reference is made on pages 11 and 12 of the paper to the Falkland Islands, which is specially interesting, as it is very likely a similar case to that which I have noticed with regard to the *Salix herbacea*, the ranunculus form being found in the Falklands, whereas in the Brazils no species of that genus have been discovered; and I may mention that, owing to the enormous preponderance of water in the southern hemisphere, in the temperature of the latitudes there, 40 degrees south, represent 50 degrees north. There is one question I should like to ask Mr. James; and that is, what is his opinion as to the dispersion of plants, which he has not dealt with in this paper? I know it is a very difficult subject to enter upon, but it is one which might have given rise to some interesting remarks by way of debate; whereas I venture to think that no one in this room, even if it had been five times as full as it is now, could find a single subject of debate in this paper. I should like to know his opinion on this matter, especially as we are not required to hold so dogmatic a belief on the question of dispersion from a

single centre in regard to plant life as is the case in reference to the dispersion of the human race. Darwin says that the same forms could not be produced—or very probably would not be—by evolution from two different plants; consequently I should like to know how would Mr. James presume the ranunculus appeared both in the Falkland and in the British Islands? In conclusion, I hope I may be allowed to add a few words to the quotation given by Mr. James from the book written by Dr. Heer, of Zurich :—“ Let us still erect statues to men who have been useful to their fellow-creatures and have distinguished themselves by their genius, but let us not forget what we owe to Him who has placed marvels in each grain of sand, a world in every drop of water.”

MR. S. R. PATTISON, F.G.S.—I am very glad that no occasion is offered for anything in the shape of criticism on this paper, the only ground for which would have been some omission of fact, or some slip in the reasoning of the author. I do not think that anything of this kind can be charged against the admirable essay to which we have listened, and I am pleased to find that the testimony of our great leader on this subject, Mr. Carruthers, confirms my own impression, as he has nothing to express but admiration. It seems to me that Mr. James has not only abolished the argument deduced from the synthetic form of plants, as it now stands, but that that argument is doubly abolished if, as Mr. Carruthers has said, there is no synthetic form at all; because, in that case, the very basis of the argument is removed. With regard to the permanence of genera, Mr. James has fought that point on every stage of the geological record, and has taken his stand on every platform on which vegetable life is found, the result being that he has shown, in the case of the plants to which he has referred, that they display an entire constancy and permanence from the earliest forms; and that this is not only true of genera, but, to a very great extent, of species also. This seems to me to be absolutely fatal to the dogma Mr. James has combated. Again, the burst of new life in the upper chalk also seems to me to be fatal to the evolution theory. I hold also that the doctrine of the imperfection of the geological record would not be maintained by any one who has at all familiarised himself with the evidences afforded by the coal measures and the shale which is found in contiguity with the coal, for no one can examine one of our numerous coal-pits without being convinced that it affords the fullest possible development of the flora of that particular epoch; and not only is this the case with regard to one coal working, but all round the world the same phenomena present themselves in a manner that must be accepted as quite conclusive. I need not dwell further upon the subject, and have only to add that I am very glad indeed to have had the advantage of hearing Mr. James read so able and interesting a paper. (Applause.)

REV. F. A. WALKER, D.D., F.L.S.—With regard to the question of the permanence or persistence of types, I may state that there is a very interesting case exhibited in the Boulak Museum which probably some of those

now present may have seen, showing the permanence of types in plants, not in the shape of fossil remains, but in those of which we have the earliest historical knowledge. We are there enabled to see the crocus and the lotus, one or two species of moss, and two or three more plants that have been taken out of mummy-cases, and which date back three and probably four thousand years, side by side with specimens of the very same flowers recently gathered and dried in Cairo, the species and varieties of the crocus and lily being the same as are found at the present day—the crocus, as far as I can see, being identical with that which is found in the Campagna, and generally in the outskirts of Rome. I suppose the permanence of this type is to be attributed to the fact that it has always been a non-cultivated species. I may add, that growers in the neighbourhood of Cairo have tried to produce different species; but the more I go about the more am I struck with the great similarity shown by the fossil remains found in England and the plants growing in Egypt at the present day. The impressions of the leaves, and the leaves themselves, of the palms and magnolias that are dug up close to Bournemouth are just the same in appearance as those in Egypt now, and serve as evidence of a tropical climate at one time in our own land.

Mr. J. HASSELL thanked Mr. James for his interesting and instructive paper. For his own part, he (Mr. Hassell) did not know much about fossil botany, but he had taught children a little about the botany of the present day, and he had been greatly struck with the remark made by a girl a short time ago. He had placed on the table the fossil impression of a fern from the coal measures. They had been talking about the nervation of plants, and he had been examining different specimens in order to show that the nervation of the dicotyledons was different to that of the monocotyledons, and that of the acotyledons different from either of the others. The girl said, "That cannot be a very old thing, sir, for it is exactly like this leaf," at the same time showing a leaf she had in her hand, the leaf of a recent fern. This is a very remarkable thing, and the more we knew of the structure of plants the better were we able to see that no possible means within themselves could have produced the differences that were observable, and, consequently, the more confidently could we take up a position against the fascinating doctrine of evolution. He thought it very desirable that the marked distinctions of species, which Mr. James had shown were presented even from the very earliest ages, should be brought prominently before the young, by their teachers. Those who believed in evolution took advantage of every occasion which presented itself to inculcate the rising generation with their views. Why, then, should not the believers in special creation do the same?

Mr. W. P. JAMES, F.L.S.—I was much pleased to hear Dr. Carruthers say he does not believe in synthetic types of plants, and, if he were still present, I would explain to him that the last paragraph of my paper, headed, "Do Synthetic Types prove Evolution?" is written from an entirely neutral point of view. I do not say that I believe in synthetic

types myself ; I merely put it hypothetically, and I am very glad to find that Mr. Carruthers believes the cycads are not a synthetic type. I have never seen them except in greenhouses, and have only taken what I have said of them from books ; but I think I may say that, if there were a synthetic type, one would imagine them to constitute such a type, intermediate between ferns, palms, and conifers. I think that many excellent geologists have been a little too rash in speaking of types as synthetic, especially some of those who are on our side—for instance, Sir J. W. Dawson has spoken more than once of plants as being synthetic types, where the evidence does not seem sufficient to justify the term. In reply to Mr. Dent, who asked me how the plants I have spoken of got into the South Pacific Sea, I have nothing to add to what I have already stated. That is a subject that does not belong to the question dealt with to-night ; but it is, nevertheless, one of great interest. The reason I mentioned the Auckland Islands is that they are as far from Great Britain as they well could be. It is one of the great puzzles in botany to account for the antarctic species. Sir Joseph Hooker said when he first explored those islands, and before he joined the evolutionists, that the remoteness of those parts of the world and their isolation from the nearest land precluded the idea of species having migrated there ; but since then, as he has become more or less of an evolutionist, I suppose he imagines a submerged continent along which the migration may have taken place. The question is, as I have said, a very puzzling one, for instance, how the little butterwort, which is a cold-climate plant, got across the tropics. Those who advocate a slow and gradual migration suppose that these plants went over the tops of the Andes ; but the difficulty still remains—how did they get to the islands in the Antarctic Sea ? The subject is a most interesting one, and those who are not botanists would find, in the great libraries to which they may belong, or to which they have access, the *Flora Antarctica* well worthy of attention, as showing surprising constancy of genera, and as containing plates, coloured by Mr. Fitch, which are of astonishing beauty. I do not assert that all genera are constant ; some, of course, are variable ; but, nevertheless, we have to account for the fact that others are so amazingly persistent ; and it should be remembered that, when we say a genus or species is constant, this involves a vast number of uniformities—thousands, in fact—down to the most minute points. (Hear, hear.) There is a plant called *Bidens tripartita*, found in the watercourses in the neighbourhood of London. If you take a specimen and strip off some of the florets that make up the composite flower, the smell of the receptacle at the top of the flower stalk will remind you at once of that of the dahlia, and here we have a very subtle bond of union indicated. Who would expect that this little English composite would show any affinity with a flower so different in appearance, and coming from America ? Mr. Hassell made a most interesting remark about a fern. He gave an instance in which a child had recognised at once the likeness

between the fossil and the existing ferns, and I can testify to the accuracy of the child's statement. The portion of the coal measures with which I used to have acquaintance was in South Wales, and I have only spoken of what I have myself seen. I never made a collection of the fossil ferns, but they were very familiar to me as a boy, and I remember that there was a district in which the shale was very brittle, and we used in walking about to break a great many pieces, and expose the beautiful impressions, which, however, were too fragile to bear handling, and so were lost. With regard to the theory of descent, I would only say that what I contend against is the doctrine advocated by Haeckel, that we must assume that all animals and plants have been lineally derived from their lowest forms. Haeckel and others have attempted to draw up a genealogical scheme for the vegetable as well as for the animal kingdom, beginning in the former with the lowest algæ, or oscillatoriaceæ, now found in the hot springs. Of course, when we see what tremendous gaps there are in this genealogical system, we are satisfied at once as to the impossibility of making it complete, and all wiser botanists have given up the attempt. In a modified form, perhaps, many have held Evolution to be just possible. We might, perhaps, imagine the creation of a form from which, as a generic type, species may have been produced by modification ; but, after all, it is but a guess, and there can be no doubt that there are forcible arguments, especially those derived from the coal formation, against any theory of descent. The evolutionists know very well that this is about the strongest point against their doctrine that can be adduced, and it does not require much ability to put it clearly. (Applause.)

The meeting was then adjourned.

THE VICTORIA INSTITUTE, 1888.

SUMMARY OF THE IMPORTANT ANNUAL MEETING ALSO THE ADDRESS

BY

SIR MONIER MONIER-WILLIAMS, K.C.I.E. D.C.L. LL.D.

Baden Professor of Sanscrit in the University of Oxford.

DELIVERED AT THE ANNUAL MEETING,

June 4th, 1888.

THE PRESIDENT, PROFESSOR G. G. STOKES, M.A., D.C.L.,

President of the Royal Society, in the Chair.

THE VICTORIA INSTITUTE,
7, ADELPHI TERRACE, STRAND, W.C.
LONDON.

NOT TO BE BOUND WITH THE VOLUME.

SUMMARY OF THE PROCEEDINGS AT THE TWENTY-
SECOND ANNUAL MEETING OF THE VICTORIA
INSTITUTE, HELD AT THE HOUSE OF THE
SOCIETY OF ARTS, 4TH JUNE, 1888.

The President, Professor G. G. STOKES, M.A., D.C.L., President
of the Royal Society, IN THE CHAIR.

The Report having been read by the Honorary Secretary, Captain Francis Petrie, F.G.S., &c.,

Sir J. RISDON BENNETT, F.R.S., moved the adoption of the Report, and referred to the important volume of Transactions just issued as sufficient evidence of the sound principles on which the Institute was conducted.

Professor H. W. BRISTOW, F.R.S., Senior Director of the Geological Survey of Great Britain, seconded the adoption of the Report, and complimented the Council on the excellent way in which their work had been done.

Mr. DAVID HOWARD, F.C.S., &c., returned thanks on behalf of the Council "whose anxious task had been so kindly recognised."

Sir MONIER MONIER-WILLIAMS, K.C.I.E., then delivered the ANNUAL ADDRESS.

The BISHOP OF DUNEDIN moved a vote of thanks to Sir MONIER MONIER-WILLIAMS and all those who had contributed the Papers, and to the discussion thereof during the session, and pointed out the value of the Address.

Mr. W. S. SETON KARR, D.C.L.—late Puisne Judge of the High Court at Calcutta—cordially seconded the resolution.

Sir HENRY BARKLY, K.C.B., G.C.M.G., F.R.S., moved a vote of thanks to the President, which was seconded by the Rev. ROBINSON THORNTON, D.D.

The Meeting then adjourned to the museum, where refreshments were served.

** The large meeting occupied the hall, vestibule, and a room off the hall.

SUMMARY OF THE REPORT.

THE REPORT STATED :—

That during the past year Her Majesty had very graciously accepted an Address from the Institute, accompanied by its latest volumes.

That increasing interest in its Objects was evinced both at home and abroad.

That the steady support of the Institute's Members continued, and had been of the utmost value in giving solidity to the Institute, in strengthening its working, and in causing many who might otherwise not have joined or aided in its work to do so, and the value of the transactions had been much enhanced thereby. The Report called special attention to the importance of these points, *as the future of the Institute so much depended upon its ability to make use of present opportunities.*

That the system under which papers were read, and the discussions and comments thereon published, now enabled Members in the most distant parts of the world to contribute papers, and to take part in the discussions.

That the Institute's American offshoot was progressing satisfactorily, and that, although an independent society, its existence had not lessened the amount of American support to the Institute.

That the increase of the Institute's Library of Reference, which had been got together by the help of many Members and Associates, was most important. The acquisition of a complete collection of the standard works of the day bearing upon the many subjects that came within the scope of the Institute would be of the greatest advantage, as such works are constantly inquired for both by town and country Members.

That the Members had elected, subject to their acceptance of the office, the Lord Chancellor as Vice-President, and Professor BRISTOW, F.R.S., Captain CREAK, R.N., F.R.S., Sir J. LEFROY, K.C.B., F.R.S., Mr. COX BOMPAS, F.G.S., Mr. G. A. SPOTTISWOODE, and the Rev. F. A. Walker, D.D., F.L.S., to the Council.

It reported that the accounts of the Institute had been audited as usual by two specially qualified Members not on the

*MYSTICAL BUDDHISM IN CONNEXION WITH THE
YOGA PHILOSOPHY OF THE HINDUS.* By SIR
MONIER MONIER-WILLIAMS, K.C.I.E., D.C.L., LL.D.,
Ph.D., Boden Professor of Sanskrit in the University of
Oxford.*

THE first idea implied by Buddhism is intellectual enlightenment. But Buddhism has its own theory of enlightenment—its own idea of true knowledge, which it calls Bodhi, not Veda. By true knowledge it means knowledge acquired by man through his own intellectual faculties and through his own inner consciousness, instincts, and intuitions, unaided by any external or supernatural revelation of any kind.

But it is important to observe that Buddhism, in the carrying out of its own theory of entire self-dependence in the search after truth, was compelled to be somewhat inconsistent with itself. It enjoined self-conquest, self-restraint, self-concentration and separation from the world for the attainment of perfect knowledge and for the accomplishment of its own *summum bonum*—the bliss of Nirvāna—the bliss of deliver-

* In this paper some of the diacritical marks, required for the accurate representation of Oriental words in the Roman character, have been omitted.

ance from the fires of passion and the flames of concupiscence. Yet it encouraged association and combination for mutual help. It established a universal brotherhood of celibate monks, open to persons of all castes and ranks, to rich and poor, learned and unlearned alike—a community of men which might, in theory, be co-extensive with the whole world—all bound together by the common aim of self-conquest, all animated by the wish to aid each other in the battle with carnal desires, all penetrated by a desire to follow the example of the Buddha, and be guided by the doctrine or law which he promulgated.

Cœnobitic monasticism in fact became an essential part of true Buddhism and a necessary instrument for its propagation.

In all this the Buddha showed himself to be eminently practical in his methods and profoundly wise in his generation. Evidently, too, he was wise in abstaining at first from all mystical teaching. Originally Buddhism set its face against all solitary asceticism and secret efforts to attain sublime heights of knowledge. It had no occult, no esoteric system of doctrine which it withheld from ordinary men.

Nor did true Buddhism at first concern itself with any form of philosophical or metaphysical teaching, which it did not consider helpful for the attainment of the only kind of true knowledge worth striving for—the knowledge of the origin of suffering and its remedy—the knowledge that suffering and pain arise from indulging lusts, and that life is inseparable from suffering, and is an evil to be got rid of by suppressing self and extinguishing desires.

In the *Mahā-parinibbāna-sutta* (Rhys Davids, 11–32) is recorded one of the Buddha's remarks shortly before his decease.

“What, O Ananda, does the Order desire of me? I have taught the law (*desito dhammo*) without making any distinction between esoteric and exoteric doctrine (*anantaram abahiram karitvā*). In the matter of the law, the Tathāgata (*i.e.*, the Buddha) has never had the closed fist of a teacher (*ācariya-mutthi*)—that is, of a teacher who withholds some doctrines and communicates others.”

Nevertheless, admitting, as we must, that early Buddhism had no mysteries reserved for a privileged circle, we must not shut our eyes to the fact that the great importance attached to abstract meditation in the Buddhist system could not fail in the end to encourage the growth of mystical ideas.

Furthermore, it is undeniable that such ideas were, in some countries, carried to the most extravagant extremes. Efforts to induce a trance-like or hypnotic condition, by abstracting the thoughts from all bodily influences, by recitation of mysti-

cal sentences and by superstitious devices for the acquisition of supernatural faculties, were placed above good works and all the duties of the moral code.

We might point, too, to the strange doctrine which arose in Nepal and Tibet—the doctrine of the Dhyāni-Buddhas (or Buddhas of Meditation)—certain abstract essences existing in the formless worlds of thought, who were held to be ethereal and eternal representatives of the transitory earthly Buddhas.

Our present concern, however, is rather with the growth and development of mystical Buddhism in India itself, through its connexion with the system called Yoga and Yogācāra.

The close relationship of Buddhism to that system is well known. The various practices included under the name Yoga did not owe their origin to Buddhism. They were prevalent in India before Gautama Buddha's time; and one of the most generally accepted facts in his biography is that, after abandoning his home and worldly associations, he resorted to certain Brāhman ascetics who were practising Yoga.

What then was the object which these ascetics had in view?

The word Yoga literally means "union" (as derived from the Sanskrit root "yuj," to join), and the proper aim of every man who practised Yoga was the mystic union (or rather re-union) of his own spirit with the one eternal Soul or Spirit of the Universe, and the acquisition of divine knowledge through that union.

It may be taken for granted that this was the Buddha's first aim when he addressed himself to Yoga in the fifth century B.C., and even to this hour, earnest men in India resort to this system with the same object.

In the *Indian Magazine* for July, 1887 (as well as in my *Brāhmanism and Hindūism**) is a short biography of a quite recent religious reformer named Svāmī Dayānanda Sarasvatī, whose acquaintance I made at Bombay in 1876 and 1877, and who only died in 1883. The story of his life reads almost like a repetition of the life of Buddha, though his teaching aimed at restoring the supposed monotheistic doctrine of the Veda.

It is recorded that his father, desiring to initiate him into the mysteries of Saivism, took him to a shrine dedicated to the god Siva; but the sight of some mice stealing the consecrated offerings and of some rats playing on the heads of the idol led him to disbelieve in Siva-worship as a means of union with the Supreme Being. Longing, however, for such union

* Published by John Murray, Albemarle Street (see p. 529).

and for emancipation from the burden of repeated births, he resolved to renounce marriage and abandon the world. Accordingly, at the age of twenty-two, he clandestinely quitted his home, the darkness of evening covering his flight. Taking a secret path, he travelled thirty miles during the night. Next day he was pursued by his father, who tried to force him to return, but in vain. After travelling farther and farther from his native province, he took a vow to devote himself to the investigation of truth. Then he wandered for many years all over India, trying to gain knowledge from sages and philosophers, but without any satisfactory result, till finally he settled at Ahmedabad. There, having mastered the higher Yoga system, he became the leader of a new sect called the Ārya-Samāj.

And here we may observe that the expression "higher Yoga" implies that another form of that system was introduced. In point of fact, the Yoga system grew, and became twofold—that is, it came in the end to have two objects.

The earlier was the higher Yoga. It aimed only at union with the Spirit of the Universe. The more developed system aimed at something more. It sought to acquire miraculous powers by bringing the body under control of the will, and by completely abstracting the soul from body and mind, and isolating it in its own essence. This condition is called Kaivalya.

In the fifth century B.C., when Gautama Buddha began his career, the later and lower form of Yoga seems to have been little known. Practically, in those days earnest and devout men craved only for union with the Supreme Being, and absorption into his essence. Many methods of effecting such union and absorption were contrived. And these may be classed under two chief heads—bodily mortification (tapas) and abstract meditation (dhyāna).

By either one of these two chief means, the devotee was supposed to be able to get rid of all bodily fetters—to be able to bring his bodily organs into such subjection to the spiritual that he became unconscious of possessing any body at all. It was in this way that his spirit became fit for blending with the Supreme Spirit.

We learn from the *Lalita-vistara* that various forms of bodily torture, self-maceration, and austerity were common in Gautama's time.

Some devotees, we read, seated themselves in one spot and kept perpetual silence, with their legs bent under them. Some ate only once a day or once on alternate days, or at intervals of four, six, or fourteen days. Some slept in wet clothes or on ashes, gravel, stones, boards, thorny grass, or spikes, or

with the face downwards. Some went naked, making no distinction between fit or unfit places. Some smeared themselves with ashes, cinders, dust, or clay. Some inhaled smoke and fire. Some gazed at the sun, or sat surrounded by five fires, or rested on one foot, or kept one arm perpetually uplifted, or moved about on their knees instead of on their feet, or baked themselves on hot stones, or entered water, or suspended themselves in the air.

Then, again, a method of fasting called very painful (*atikricchra*), described by Manu (xi. 213), was often practised. It consisted in eating only a single mouthful every day for nine days and then abstaining from all food for the three following days.

Another method, called the lunar fast (vi. 20, xi. 216), consisted in beginning with fifteen mouthfuls at full moon, and reducing the quantity by one mouthful till new moon, and then increasing it again in the same way till full moon.

Passages without number might be quoted from ancient literature to prove that similar practices were resorted to throughout India with the object of bringing the body into subjection to the spirit. And these practices have continued up to the present day.

A Muhammadan traveller, whose narrative is quoted by Mr. Mill (*British India*, i. 355), once saw a man standing motionless with his face towards the sun.

The same traveller, having occasion to revisit the same spot sixteen years afterwards, found the very same man in the very same attitude. He had gazed on the sun's disk till all sense of external vision was extinguished.

A Yogī was seen not very long ago (Mill's *India*, i. 353) seated between four fires on a quadrangular stage. He stood on one leg gazing at the sun, while these fires were lighted at the four corners. Then placing himself upright on his head, with his feet elevated in the air, he remained for three hours in that position. He then seated himself cross-legged, and continued bearing the raging heat of the sun above his head and the fires which surrounded him till the end of the day, occasionally adding combustibles with his own hands to increase the flames.

I, myself, in the course of my travels, encountered Yogīs who had kept their arms uplifted for years, or had wandered about from one place of pilgrimage to another under a perpetual vow of silence, or had no place to lie upon but a bed of spikes.

As to fasting, the idea that attenuation of the body by abstinence from food, facilitates union of the human soul with

the divine, or at any rate promotes a keener insight into spiritual things, is doubtless as common in Europe as in Asia; but the most austere observer of Lent in European countries would be hopelessly outdone by devotees whose extraordinary powers of abstinence may be witnessed in every part of India.

If we now turn to the second great method of attaining mystic union with the Divine Essence, namely, by profound abstract thought, we may observe that it, too, was everywhere prevalent in Buddha's time.

Indeed, one of the names given by Indian philosophers to the One Universal Spirit is *Cit*, "Thought." By that name of course, is meant pure abstract thought, or the faculty of thought separated from every concrete object. Hence, in its highest state the eternal infinite Spirit, by its very nature, thinks of nothing. It is the simple thought faculty, wholly unconnected with any object, about which it thinks. In point of fact, the moment it begins to exercise this faculty, it necessarily abandons for a time its condition of absolute oneness, abstraction and isolation, to associate itself with something inferior, which is not itself.

It follows, therefore, that intense concentration of the mind on the One Universal Spirit amounts to fixing the thought on a mere abstract Essence, which reciprocates no thought in return, and is not conscious of being thought about by its worshipper.

In harmony with this theory, we find that the definition of Yoga, in the second aphorism of the *Yoga-sūtra*, is, "the suppression (*nirodha*) of the functions or modifications (*vrutti*) of the thinking principle (*citta*)."¹ So that, in reality, the union of the human mind with the infinite Principle of thought amounts to such complete mental absorption, that thought itself becomes lost in pure thought.

In the *Sakuntalā* (vii. 175) there is a description of an ascetic engaged in this form of Yoga, whose condition of fixed meditation and immovable impassiveness had lasted so long that ants had thrown up a mound as high as his waist, and birds had built their nests in the long clotted tresses of his tangled hair.

Not very dissimilar phenomena may be witnessed even in the present day. I, myself, not many years ago, saw at Allahabad a devotee who had maintained a sitting, contemplative posture with his feet folded under his body, in one place near the fort for twenty years.

During the Mutiny cannon thundered over his head, and bullets hissed all around him, but nothing apparently disturbed his attitude of profound meditation.

It is clear, then, from all we have stated, that, supposing Gautama to have made up his mind to renounce the world and devote himself to a religious life, his adoption of a course of Yoga was a most ordinary proceeding.

In the first instance, as we have seen, he tested the value of painful self-mortification by a long sexennial fast. Then, after discovering the uselessness of mere bodily austerities, he took food naturally, and adopting the second method, applied himself to profound abstract meditation.

A large number of the images of Buddha represent him sitting on a raised seat, with his legs folded under his body, and his eyes half-closed, in this condition of abstraction (*samādhi*)—sometimes called *Yoga-nidrā*; that is, a trance-like state, compared to profound sleep, or a kind of hypnotism.

According to the account given in the *Mahā-vagga* (i. 1), he seated himself in this way under four trees in succession, remaining absorbed in thought for seven days and nights under each tree, till he was, so to speak, re-born as Buddha "the Enlightened." Till then he had no right to that title.

And those four successive seats probably symbolised the four recognised stages of meditation* (*dhyāna*) rising one above another, till thought itself was converted into non-thought.

We know, too, that the Buddha went through still higher progressive stages of meditation at the moment of his death or final decease (*Pari-nirvāna*), thus described in the *Mahā-parinibbāna sutta* (vi. 11):

"Then the Venerable One entered into the first stage of meditation (*pathamajjhānam*); and rising out of the first stage, he passed into the second; and rising out of the second, he passed into the third; and rising out of the third, he passed into the fourth; and rising out of the fourth stage, he attained the conception of the infinity of space (*ākāsānan-cāyatanam*); and rising out of the conception of the infinity of space, he attained the conception of the infinity of intelligence (or second *Arūpa-brahma-loka*). And rising out of the idea of the infinity of intelligence, he attained the conception of absolute nonentity (*ākīñcaññāyatanam*); and rising out of the idea of nonentity, he entered the region where there is neither consciousness nor unconsciousness; and rising out of that region, he entered the state in which all sensation and all perception of ideas had wholly ceased."

This strange passage shows that even four progressive

* I give this as a theory of my own. M. Senart considers that the sun's progress is symbolised. I am no believer in the sun theory as applicable to this point.

stages of abstraction did not satisfy the requirements of later Buddhism in regard to the intense sublimation of the thinking faculty needed for the complete effacement of all sense of individuality. Higher and higher altitudes had to be reached, insomuch that the fourth stage of abstract meditation is sometimes divided and sub-divided into what are called eight vimokhas and eight samāpattis—all of them forms and stages of ecstatic meditation.*

A general name, however, for all the higher trance-like states is *Samādhi*, and by the practice of *Samādhi* the six transcendent faculties (*Abhiññā*) might ultimately be obtained, viz., the inner ear, or power of hearing words and sounds however distant (clair-audience, as it might be called), the inner eye or power of seeing all that happens in every part of the world (clair-voyance), knowledge of the thoughts of others, recollection of former existences, the knowledge of the mode of destroying the corrupting influences of passion, and, finally, the supernatural powers called *Iddhi*, to be subsequently explained.

But to return to the Buddha's first course of meditation at the time when he first attained Buddhahood. This happened during one particular night, which was followed by the birthday of Buddhism.

And what was the first grand outcome of that first profound mental abstraction? One legend relates that in the first watch of the night all his previous existences flashed across his mind; in the second he understood all present states of being; in the third he traced out the chain of causes and effects, and at the dawn of day he knew all things.

According to another legend, there was an actual outburst of the divine light before hidden within him.

We read in the *Lalita-vistara* (chap. i.) that at the supreme moment of his intellectual illumination brilliant flames of light issued from the crown of his head, through the interstices of his cropped hair. These rays are sometimes represented in his images, emerging from his skull in a form resembling the five fingers of an extended hand.

Mark, however, that it is never stated that Gautama ever attained to the highest result of the true Yoga of Indian philosophy—union with the Supreme Spirit. On the contrary, his self-enlightenment led to entire disbelief in the separate existence of any eternal, infinite Spirit at all—any Spirit, in fact, with which a spirit existing in his own body could blend, or into which it could be absorbed.

* These are described in Childers's *Pāli Dictionary*, s.v.

If the Buddha was not a materialist, in the sense of believing in the eternal existence of material atoms, neither could he in any sense be called a "spiritualist," or "spiritist."

With him Creation did not proceed from an Omnipotent Spirit evolving phenomena out of itself by the exercise of almighty will, nor from an eternal self-existing, self-evolving germ of any kind. As to the existence of any spiritual substance in the Universe which was not matter and was imperceptible by the senses, it could not be proved.

Nor did he believe in the eternal existence of an invisible, intangible, human self or Ego, commonly called Soul, as distinct from a material body. In this he differed widely from the Yoga. The only eternity of early Buddhism was in an eternity of "becoming," not of "being,"—an eternity of universes, all succeeding each other, and all lapsing into nothingness.

In short, the Buddha's enlightenment consisted, first, in the discovery of the origin and remedy of suffering, and, next, in the knowledge of the existence of an eternal Force—a force generated by what in Sanskrit is called *Karman*, "Act." Who, or what, started the first act the Buddha never pretended to be able to explain. He confessed himself in regard to this point a downright Agnostic.

All he affirmed was that every man was created by the force of his own acts in former bodies, combined with a force generated by intense attachment to existence (*upādāna*). The Buddha himself was so created, and had been created and re-created through countless bodily forms; but he had no spirit or soul existing separately between the intervals of each creation. By his protracted meditation he attained to no higher knowledge than this, and although he himself rose to loftier heights of knowledge than any other man of his day, he never aspired to other than the extraordinary faculties which were within the reach of any human being capable of rising to the same sublime abstraction of mind.

He was even careful to lay down a precept that the acquisition of transcendent human faculties was restricted to the perfected saints called *Arhats*; and so important did he consider it to guard such faculties from being claimed by mere impostors, that one of the four prohibitions communicated to all monks on first admission to his monastic Order was that they were not to pretend to such powers.

Nor is there any proof that even *Arhats* in Gautama's time were allowed to claim the power of working physical miracles.

By degrees, no doubt, powers of this kind were ascribed to them as well as to the Buddha. Even in the *Vinaya*, one of

the oldest portions of the *Tripitaka*, we find it stated that Gautama Buddha gained adherents by performing three thousand five hundred supernatural wonders (in Pāli *pāṭihāriya*). These were thought to be evidences of his mission as a great teacher and saviour of mankind; but the part of the narrative recording these, although very ancient, is probably a legendary addition of later date. It is interesting, however, to trace in other portions of the first literature, the development of the doctrine that Buddhahood meant first transcendent knowledge, and then supernatural faculties, and finally miraculous powers.

In the *Akkanheyya Sutta* (said to be written in the fourth century B.C.) occurs this remarkable passage, translated by Professor Rhys Davids (p. 214):—

“If a Monk should desire through the destruction of the corrupting influences (*āsavas*), by himself, and even in this very world, to know and realise and attain to Arhatship, to emancipation of heart, and emancipation of mind, let him devote himself to that quietude of heart which springs from within, let him not drive back the ecstasy of contemplation, let him look through things, let him be much alone.

“If a Monk should desire to hear with clear and heavenly ear, surpassing that of men, sounds both human and celestial, whether far or near; if he should desire to comprehend by his own heart the hearts of other beings and of other men; if he should desire to call to mind his various temporary states in the past, such as one, two, three, four, five, ten, twenty, a hundred, a thousand, a hundred thousand births, or his births in many an age and æon of destruction and renovation, let him devote himself to that quietude which springs from within.”

Then, in the *Mahā-parinibbāna-sutta* (i. 33) occurs the following:—

“At that time the Blessed One—as instantaneously as a strong man would stretch forth his arm, or draw it back again when he had stretched it forth—vanished from this side of the river, and stood on the further bank with the company of the brethren.”

And, again, the following:—

“I call to mind, Ānanda, how when I used to enter into an assembly of many hundred nobles, before I had seated myself there, or talked to them, or started a conversation with them, I used to become in colour like unto their colour, and in voice like unto their voice. Then, with religious discourse, I used to instruct, incite, and quicken them, and fill them with gladness. But they knew me not when I spoke, and would

say, 'Who may this be who thus speaks? a man or a god?' Then, having instructed, incited, quickened and gladdened them with religious discourse, I would vanish away. But they knew me not even when I vanished away; and would say, 'Who may this be who has thus vanished away? a man, or a god?' " (*Mahā-parinibbāna-sutta*, iii. 22.)

Such passages in the early literature afford an interesting exemplification of the growth of supernatural and mystical ideas, and account for the ultimate association of the Northern Buddhistic system, with Saivism, demonology, magic, and various spiritual phenomena connected with what has been called "Esoteric Buddhism."

These ideas, however, originated in India, and we may now proceed to trace their development in the later *Yoga* or "aphorisms of the Yoga philosophy," composed by Patanjali, to which I have already referred.

In that work eight requisites of *Yoga* are enumerated (ii. 29); namely, 1, abstaining from five evil acts (*yama*); 2, performing five positive duties (*niyama*); 3, settling the limbs in certain postures (*āsana*); 4, regulating and suppressing the breath (*prāṇāyāma*); 5, withdrawing the senses from their objects (*pratyāhāra*); 6, fixing the thinking faculty (*dhāraṇā*); 7, internal self-contemplation (*dhyāna*); 8, trance-like self-concentration (*samādhi*).

These eight are indispensable requisites for the gaining of Patanjali's *summum bonum*—the complete abstraction or isolation (*kaivalya*) of the soul in its own essence and for the acquirement of supernatural faculties.

Taking now these eight requisites of *Yoga* in order, we may observe, with regard to the first, that the five evil acts to be avoided correspond to the five commandments in Buddhism, viz., "kill not," "steal not," "commit no impurity," "lie not." The fifth alone, "abstain from all worldly enjoyments," is different, the Buddhist fifth prohibition being "drink no strong drink."

With regard to the second requisite, the five positive duties are—self-purification, both external and internal (both called *sauca*); the practice of contentment (*santosha*); bodily mortification (*tapas*); muttering of prayers, or repetition of mystical syllables (*svādhyāya*, or *japa*), and contemplation of the Supreme Being.

The various processes of bodily mortification and austerities have been already described.

As to the muttering of prayers, the repetition of mystic syllables such as *Om* (a symbol for the Triad of Gods), or of any favourite deity's name, is held among Hindūs to be

highly efficacious.* In a similar manner among Northern Buddhists the six-syllabled sentence: "Om mani padme hūm"—"Reverence to the jewel in the lotus. Amen"—is used as a charm against the sixfold course of transmigration. The Jewel may mean Avalokitesvara, the patron saint of Tibet, fabled to have sprung from a lotus, or it may contain a *double-entendre*—an occult allusion to the Sāṅkhya Purusha and Prakriti, or to the Linga and Yoni of Saivism, as symbolising the generative force of Nature. No other prayer-formula in the world is repeated so often.

Other mystical syllables (such as sam, yam, ram, lam) are supposed to contain some occult virtue.

The third requisite—posture—would appear to us a somewhat trivial aid to the union of the human spirit with the divine; but with Hindūs it is an important auxiliary, fraught with great benefit to the Yogī.

The alleged reason is that certain sitting postures (*āsana*) and cramping of the lower limbs are peculiarly efficacious in producing bodily quietude and preventing restlessness. Some of the postures have curious names, for example:—*Padmāsana*, "the lotus posture"; *vīrāsana*, "the heroic posture"; *sinhāsana*, "the lion posture"; *kūrmāsana*, "the tortoise posture"; *kukkutāsana*, "the cock posture"; *dhanur-āsana*, "bow posture"; *mayūrāsana*, "peacock posture." In the first the right foot is placed on the left thigh, and the left on the right thigh.

In short, the idea is that compression of the lower limbs, in such a way as to prevent the possibility of the slightest movement, is most important as a preparation for complete abstraction of soul.

Then, as another aid, particular twistings (called *mudrā*) of the upper limbs—of the arms, hands, and fingers—are enjoined.

In Europe violent movements of the limbs are practised by devotees with the view of uniting the human spirit with the Divine. Those who have seen the whirling and "howling" dervishes of Cairo can testify to this. The fainting fits which result from their violent exertions, inspirations, expirations, and utterances of the name of God are believed to be ecstatic states in which such union is effected.

The fourth requisite—regulation and suppression of the breath—is perhaps the one of all the eight which it is most difficult for Europeans to understand or appreciate; yet with Hindūs it is all-important (being called *Hatha-vidyā*). Nor are the ideas connected with it wholly unknown in Europe.

* See my *Brāhmanism and Hindūism* (John Murray), p. 105.

According to Swedenborg,* thought commences and corresponds with respiration :—

“When a man thinks quickly his breath vibrates with rapid alternations ; when the tempest of anger shakes his mind his breath is tumultuous ; when his soul is deep and tranquil, so is his respiration.” And he adds : “It is strange that this correspondence between the states of the brain or mind and the lungs has not been admitted in science.”

The Hindū belief certainly is that deep inspirations of breath assist in concentrating and abstracting the thoughts and preventing external impressions. But, more than this, five sorts of air are supposed to permeate the human body and play an important part in its vitality. The Hatha-dīpikā says : “As long as the air remains in the body, so long life remains. Death is the exit of the breath. Hence the air should be retained in the body.”

In regulating the breath, the air must first be drawn up through one nostril (the other being closed with the finger), retained in the lungs, and then expelled through the other nostril. This exercise must be practised alternately with the right and left nostril. Next, the breath must be drawn forcibly up through both nostrils, and the air imprisoned for as long a time as possible in the lungs. Thence it must be forced by an effort of will towards the internal organs of the body, or made to mount to the centre of the brain.

The Hindūs, however, do not identify the breath with the soul. They believe that a crevice or suture called the Brahma-randhram at the top of the skull serves as an outlet for the escape of the soul at death. A Hindū Yogī's skull is sometimes split at death by striking it with a sacred shell. The idea is to facilitate the exit of the soul. It is said that in Tibet the hair is torn out of the top of the head, with the same object.

In the case of a wicked man the soul is supposed to escape through one of the lower openings of the body.

The imprisonment of the breath in the body by taking in more air than is necessary for respiration, is the most important of the breath exercises. It is said that Hindū ascetics, by constant practice, are able by this means to sustain life under water, or to be buried alive for long periods of time. Such feats of endurance would be wholly impracticable in the case of Europeans. It seems, however, open to question, whether or not it may not be possible for human beings of particular constitutions to practise a kind of

* Quoted in Colonel Olcott's *Yoga Philosophy*, p. 282.

hibernation like that of animals, by some method of suspending temporarily the organic functions. A certain Colonel Townsend is said to have succeeded in doing so.

A well-known instance of suspended animation occurred in the Punjab in 1837. A certain Yogī was there, by his own request, buried alive in a vault for forty days in the presence of Runjit Singh and Sir Claude Wade; his eyes, ears, and every orifice of his body having been first stopped with plugs of wax. Dr. McGregor, the then residency surgeon, also watched the case. Every precaution was taken to prevent deception. English officials saw the man buried, as well as exhumed, and a perpetual guard over the vault was kept night and day by order of Runjit Singh himself. At the end of forty days the disinterment took place. The body was dried up like a stick, and the tongue, which had been turned back into the throat, had become like a piece of horn. Those who exhumed him followed his previously-given directions for the restoration of animation, and the Yogī told them he had only been conscious of a kind of ecstatic bliss in the society of other Yogīs and saints, and was quite ready to be buried over again.

What amount of fraud, if any, there may be in these feats it is impossible to say. The phenomena may possibly be accounted for by the fact that Indian Yogīs have studied the habits of hibernating animals for ages.

I may add that it is commonly believed throughout India that a man whose body is sublimated by intense abstract meditation never dies, in the sense of undergoing corruption and dissolution. When his supposed death occurs he is held to be in a state of trance, which may last for centuries, and his body is, therefore, not burnt, but buried—generally in a sitting posture—and his tomb is called a samādh.

With regard to the fifth requisite—the act of withdrawing the senses from their object, as, for example, the eye from visible forms—this is well compared to the act of a tortoise withdrawing its limbs under its shell.

The sixth requisite—fixing the principle of thought—comprises the act of directing the thinking faculty (*citta*) towards various parts of the body, for example, towards the heart, or towards the crown of the head, or concentrating the will-force on the region between the two eyebrows, or even fixing the eyes intently on the tip of the nose. (Compare *Bhagavad-gītā*, vi. 13.)

The seventh and eighth requisites—viz., internal self-contemplation and intense self-concentration—are held (when conjoined with the sixth) to be most important as leading to

the acquisition of certain supernatural powers, of which the following are most commonly enumerated :—(1) *Animan*, “the faculty of reducing the body to the size of an atom”; (2) *Mahiman*, or *Gariman*, “increasing the size or weight at will”; (3) *Laghiman*, “making the body light at will”; (4) *Prāpti*, “reaching or touching any object or spot, however apparently distant”; (5) *Prākāmya*, “unlimited exercise of will”; (6) *Isitva*, “gaining absolute power over one’s self and others”; (7) *Vasitā*, “bringing the elements into subjection”; (8) *Kāmāvasāyitā*, “the power of suppressing all desires.”

A *Yogī* who has acquired these powers can rise aloft to the skies, fly through space, pierce the mysteries of planets and stars, cause storms and earthquakes, understand the language of animals, ascertain what occurs in any part of the world, or of the universe, recollect the events of his own previous lives, prolong his present life, see into the past and future, discern the thoughts of others, assume any form he likes, disappear, reappear, and even enter into another man’s body and make it his own.

Such were some of the extravagant ideas which grew with the growth of the *Yoga* system, and all these exist in the later developments of Buddhism. The Buddha himself is fabled by his followers to have ascended to the *Trayas-trinsa* heaven of *Indra*, walked on water, stepped from one mountain to another, and left impressions of his feet on the solid rock; although in the well-known *Dhamma-pada* it is twice declared (254, 255), “There is no path through the air.”

Of course it was only natural that, with the development of Buddhism and its association with *Saivism*, the Buddha himself should have become a centre for the growth and accumulation of supernatural and mystical ideas. It is in this way that the later doctrine makes every Buddha have a threefold existence or possess three bodies, much in the same way as in *Hindūism* three bodies are assigned to every being.

The first of the Buddha’s bodies is the *Dharma-kāya* “body of the Law,” supposed to be a kind of ethereal essence of a highly sublimated nature and co-extensive with space. This essence was believed to be eternal, and after the Buddha’s death, was represented by the Law or Doctrine (*Dharma*) he taught. Its *Brāhmanical* analogue is probably *Brahman*, “the Universal Spirit,” which, when associated with Illusion (or the *Kāraṇa-sarīra*), may assume a highly ethereal subtle body, called *Linga-sarīra*.

The second body is the *Sambhoga-kāya*, “body of conscious bliss,” which is of a less ethereal and more material nature than the last. Its *Brāhmanical* analogue appears to be

the intermediate celestial body belonging to departed spirits, called Bhoga-deha, which is of an ethereal character, though it is composed of sufficiently gross (sthūla) material particles to be capable of experiencing happiness in heaven.

The third body is the Nirmāna-kāya, "body of visible shapes and transformations," that is to say, those visible concrete material forms in which every Buddha who exists as an invisible and eternal essence, is manifested on the earth or elsewhere for the propagation of the true doctrine. The Brāhmanical analogue of this third body appears to be the earthly gross body, called Sthūla-sarīra.

There is a well-known legend which relates how the great Brāhman sage Sankarācārya entranced his gross body, and then, having forced out his soul along with his subtle body, entered the dead body of a recently deceased King, which he occupied for several weeks.

In connexion with these mystical ideas, I may here allude to the belief that certain modern Eastern sages, skilled in occult science, have the power of throwing their gross bodies into a state of mesmeric trance, and then by a determined effort of will projecting or forcing out the ethereal body through the pores of the skin, and making this phantasmal form visible in distant places.*

We learn from Mr. Sinnett that a community of Buddhist "Brothers" called Mahātmas, are now living in secluded spots in the deserts of Tibet, who have emancipated their interior selves from physical bondage by meditation, and are believed to possess "astral" or ethereal bodies (distinct from their gross bodies), with which they are able to rise in the air, or move through space, by the mere exercise of will.

I am not aware whether the Psychological Research Society has extended its researches to the deserts of Tibet, where these phenomena are said to take place.

In curious agreement with these notions, are the beliefs of various uncivilised races. Dr. Tylor, in his *Primitive Culture* (i. 440), relates how the North American Indians and others believe that their souls quit their bodies during sleep, and go about hunting, dancing, visiting, etc.

Old legends relate how Simon Magus made statues walk; how he flew in the air; changed his shape; assumed two faces; made the vessels in a house seem to move of themselves (Yule's *Marco Polo*, i. 306). Friar Ricold relates that "a man from India was said to fly. The truth was that he

* Colonel Olcott and Mr. Sinnett mention this faculty as characteristic of Asiatic occultism.

did walk close to the surface of the ground without touching it" (Yule's *Marco Polo*, i. 307).

As to the phenomena of modern spiritualism, these are declared by Mr. Sinnett to be quite distinct from those of Asiatic occultism. He maintains that modern spiritualism requires the intervention of "mediums," who neither control nor understand the manifestations of which they are the passive instruments; whereas the phenomena of occultism are the "achievements of a conscious living operator," produced by a simple effort of his own will. The important point, he adds, "which occultism brings out is, that the soul of man, while something enormously subtler and more ethereal and more lasting than the body, is itself a material body. . . . The ether that transmits light is held to be material by any one who holds it to exist at all; but there is a gulf of difference between it and the thinnest of the gases." In another place he advances an opinion that the spirit is distinct from the soul. It is the soul of the soul.

And again: "The body is the prison of the soul for ordinary mortals. We can see merely what comes before its windows; we can take cognisance only of what is brought within its bars. But the adept has found the key of his prison, and can emerge from it at pleasure. It is no longer a prison for him—merely a dwelling. In other words, the adept can project his soul out of his body to any place he pleases with the rapidity of thought."*

It is worth noting that many believers in Asiatic occultism hold that a hitherto unsuspected force exists in nature called Odic force (is this to be connected with Psychic force?), and that it is by this that the levitation of entranced persons is effected. Some are said to have the power of lightening their bodies by swallowing large draughts of air. The President of the Theosophical Society, Colonel Olcott, alleges that he himself, in common with many other observers, has seen a person raised in the air by a mere effort of will.

Surely these phenomena may be mere feats of conjuring. In the *Asiatic Monthly Journal* for March, 1829, an account is given of a Brāhman who poised himself *apparently* in the air, about four feet from the ground, for forty minutes, in the presence of the Governor of Madras. Another juggler sat on three sticks put together to form a tripod. These were removed, one by one, and the man remained sitting in the

* *The Occult World*, by A. P. Sinnett Vice-President of the Theosophical Society, pp. 12, 15, 20.

air. On the other hand, it is contended, that "since we have attained, in the last half-century, the theory of evolution, the antiquity of man, the far greater antiquity of the world itself, the correlation of physical forces, the conservation of energy, spectrum analysis, photography, the locomotive engine, electric telegraph, spectroscope, electric light, and the telephone, who shall dare to fix a limit to the capacity of man?" * "Few will be disposed to deny altogether the truth of such a contention, however much they may dissent from Colonel Olcott's theosophical and neo-Buddhist views.

There may be, of course, latent faculties in humanity which are at present quite unsuspected, and yet are capable of development in the future.

I may also refer to the statement of Sir James Paget, in his recent address on "Scientific Study," that many things now held to be inconceivable and past man's imagination are profoundly and assuredly true, and that it will be in the power of Science to prove them to be so.†

Clearly mystical Buddhism is far too big a subject to be compressed within the limits of a single paper.

I will merely, in conclusion, express my doubts whether Asiatic occultism, as connected with the Yoga philosophy, and as believed in by Colonel Olcott, Mr. Sinnett, and many others, will ever bear the searching light of European scientific investigation.

Nevertheless, it seems to me to be a subject which ought not to be brushed aside by our scientists as unworthy of consideration. It furnishes, in my opinion, a highly interesting topic of inquiry, especially in its bearing on the so-called "Spiritualism," "neo-Buddhism," and "Theosophy" of the present day. The practices connected with mesmerism, animal magnetism, clairvoyance, thought-reading, &c., have their counterparts in the Yoga system prevalent in India more than 2,000 years ago. "The thing that hath been, it is that which shall be; and that which is done is that which shall be done: and there is no new thing under the sun."

* Colonel Olcott's *Lectures on Theosophy and Archaic Religions*, p. 109.

† Report in the *Times* newspaper.

ON A FEW OF THE CHIEF CONTRASTS BETWEEN THE
ESSENTIAL DOCTRINES OF BUDDHISM AND OF
CHRISTIANITY, BY SIR M. MONIER-WILLIAMS, K.C.I.E.

“It is one of the strange phenomena of the present day, that even educated persons are apt to fall into raptures over the doctrines of Buddhism, attracted by the bright gems which its admirers cull out of its moral code, and display ostentatiously, while keeping out of sight all the dark spots of that code, all its triviality and all those precepts which no Christian could soil his lips by uttering. It has even been asserted that much of the teaching in the Sermon on the Mount is based on previously current moral precepts, which Buddhism was the first to introduce to the world, 500 years before Christ. But this is not all. The admirers of Buddhism maintain that the Buddha was not a mere teacher of morality, but of many other great truths. He has been justly called, say they, ‘the Light of Asia,’ though they condescendingly admit that Christianity, as a later development, is more adapted to become the religion of the world.

NOTE.—Those who have observed the progress of modern thought in regard to Neo-Buddhism will appreciate the insertion of the above remarks as a sequel to the Address: they were delivered at a public Conference this year, and have been revised for the Institute by the author. Another distinguished Member of the Institute writes:—“It has always seemed to me that the important point to keep in view as to Neo-Buddhism is that the sentiment in Arnold’s *Light of Asia* is utterly false; that the conceptions there are borrowed from Christianity; that Buddhism has not merely failed in practice, but is essentially the bare hollow emptiness that Sir Monier-Williams describes, and offers nothing but metaphysics and superstition; that, in fact, as to the first, Schopenhauer is a better leader for those who wish Nihilism, and that the whole of Esoteric Buddhism, so called, is a fraud.”—ED.

"Let us, then, inquire for a moment what claim Gautama Buddha has to this title, 'the Light of Asia.'

"Now, in the first place, those who give him this name forget that his doctrines only spread over Eastern Asia, and that Mohammed has as much right as Buddha to be called 'the Light of Asia.' But was the Buddha, in any true sense, a Light to any part of the world? It is certainly true that the main idea implied by Buddhism is intellectual enlightenment. Buddhism, before all things, means enlightenment of mind, resulting from intense self-concentration, from intense abstract meditation, combined with the exercise of a man's own reasoning faculties and intuitions. It was only after such a course of meditation that the so-called Light of Knowledge burst upon the man Gautama. It was only then that he became Buddha, the Enlightened One. We read in the *Lalita Vistara* that, at the supreme moment of this enlightenment, actual flames of light issued from the crown of the Buddha's head. Of what nature, then, was this so-called Light of Knowledge that radiated from the Buddha? Was it the knowledge of his own deep depravity of heart, or of the origin of sin? No; the Buddha's light was in this respect profound darkness. He confessed himself a downright Agnostic. The origin of the first evil act was to him an inexplicable mystery. Was it, then, a knowledge of the goodness, justice, and holiness of an Omnipotent Creator? Was it a knowledge of the Fatherhood of God? No; the Buddha's light was in these respects also absolute darkness. Here, too, he acknowledged himself a thorough Agnostic. He knew nothing of the existence of any Supreme Being—of any Being higher than himself. What, then, was the light that broke upon the Buddha? What was this enlightenment which has been so much written about and extolled? All that he claimed to have discovered was the Origin of suffering and the remedy of suffering. All the light of knowledge to which he attained came to this: that suffering arises from indulging desires; that suffering is inseparable from life; that all life is suffering; and that suffering is to be got rid of by the suppression of desires, and by the extinction of personal existence. You see here the first great contrast. When the Buddha said to his converts, 'Come, follow me,' he bade them expect to get rid of suffering, he told them to stamp out suffering by stamping out desires. When the Christ said to His disciples, 'Come, follow me,' He bade them expect suffering, He told them to glory in their sufferings, to rejoice in their sufferings, nay, to

expect the perfection of their characters through suffering. It is certainly noteworthy that both Christianity and Buddhism agree in asserting that all creation travaileth in pain, in bodily suffering, in tribulation. But mark the vast, the vital distinction in the teaching of each. The one taught men to aim at the glorification of the suffering body, the other at its utter annihilation. What says our Bible? We Christians, it says, are members of Christ's Body, of His flesh and of His Bones, of that Divine Body, which was a suffering body, a cross-bearing body, and is now a glorified body, an ever-living, life-giving body. A Buddhist, on the other hand, repudiates, as a simple impossibility, all idea of being a member of the Buddha's body. How could a Buddhist be a member of a body which was burnt, which was dissolved, which became extinct at the moment when the Buddha's whole personality became extinguished also? But, say the admirers of Buddhism, at least you will admit that the Buddha told men to get rid of sin, and to aim at sanctity of life? Nothing of the kind. The Buddha had no idea of sin, as an offence against God, no idea of true holiness. What he said was, Get rid of the demerit of evil actions and accumulate merit by good actions. This storing up of merit—like capital at a bank—is one of those inveterate propensities of human nature which Christianity alone has delivered men from.

“Only the other day I met an intelligent Sikh from the Punjab, and asked him about his religion. He replied, ‘I believe in One God, and I repeat my prayers, called Jap-jee, every morning and evening. These prayers occupy six pages of print, but I can get through them in little more than ten minutes.’ He seemed to pride himself on this rapid recitation as a work of increased merit. I said, ‘What else does your religion require of you?’ He replied, ‘I have made one pilgrimage to a sacred well near Amritsar; eighty-five steps lead down to it: I descended and bathed in the sacred pool. Then I ascended one step and repeated my Jap-jee in about ten minutes. Then I descended again to the pool and bathed again, and ascended to the second step and repeated my prayers a second time. Then I descended a third time, and ascended to the third step, and repeated my Jap-jee a third time; and so on for the whole eighty-five steps. It took me exactly fourteen hours, from 5 p.m. one evening to 7 a.m. next morning.’ I asked, ‘What good did you expect to get by going through this task?’ He replied, ‘I hope I have laid up a great store of merit, which will last me for a long time.’ This, let me

tell you, is a genuine Hindu idea. It is of the very essence of Brahmanism and Hinduism. It is equally a Mohammedan idea. It is even more a Buddhist idea. Buddhism recognises the terrible consequences of evil actions, but provides no remedy except the accumulation of merit by good actions as a counterpoise. The Buddha never claimed to be a deliverer from sin. He never pretended to set any one free from the bondage of sinful acts and sinful habits. He never professed to provide any remedy for the leprosy of sin, any medicine for a dying sinner. On the contrary, by his doctrine of Karma he bound a man hand and foot to the consequences of his own acts with chains of adamant. He said, in effect, to every one of his disciples, 'You are in slavery to a tyrant of your own setting up; your own deeds, words, and thoughts in the present and former states of being are your own avengers through a countless series of existences. If you have been a murderer, a thief, a liar, impure, a drunkard, you must pay the penalty in your next birth; either in one of the hells, or as an unclean animal, or as an evil spirit, or as a demon. You cannot escape, and I am powerless to set you free.' 'Not in the heavens' (says the Dhamma-pada), 'not in the midst of the sea, not if thou hidest thyself in the clefts of the mountains, wilt thou find a place where thou canst escape the force of thine own evil actions.' Contrast the first sermon of Christ, 'The Spirit of the Lord is upon me, because He hath sent me to proclaim liberty to the captives, and the opening of the prison to them that are bound.' Yes, in Christ alone there is deliverance from the bondage of former transgressions, from the prison-house of former sins; a total cancelling of the past, a complete blotting out of the handwriting, that is against us; the opening of a clear course for every man to start afresh; the free gift of pardon and of life to every criminal, to every sinner—even the most heinous.

"But here, again, I seem to hear some admirers of Buddhism say:—'We admit the force of these contrasts, but surely you will allow that in the law of Buddha we find precepts which tell us not to love the world, not to love money, not to show enmity towards our enemies, not to do unrighteous acts, not to commit impurities, to overcome evil by good, and to do to others as we would be done by?' Yes, I admit all this; nay, I admit even more. I allow that some Buddhist precepts go beyond corresponding Christian injunctions; for the laws of Buddha prohibit all killing, even of animals for food. They demand total abstinence from stimulating drinks, disallowing even moderation in their use. They bid all

who aim at the highest perfection abandon the world, and lead a life of celibacy and monkhood. In fine, they enjoin total abstinence, because they dare not trust human beings to be temperate. How, indeed, could they trust them, when they promise no help, no Divine grace, no restraining power? The glory of Christianity is, that having freely given that power to man, it trusts him to make use of the gift. It seems to speak to him thus: 'Thy Creator has endowed thee with freedom of choice, and therefore respects thy liberty of action. He imposes on thee no rule of total abstinence in regard to natural desires; He simply bids thee keep them within bounds, so that thy self-control and thy moderation may be known unto all men. He places thee in the world amid trials and temptations, and says to thee, 'My grace is sufficient for thee, and by its aid thou mayest overcome them all.'

"And, believe me, the great contrast between the moral precepts of Buddhism and Christianity is not so much in the letter of the precepts as in the motive power brought to bear in their application. Buddhism says: Be righteous by yourselves, and through yourselves, and for the final getting rid of all suffering, of all individuality, of all life in yourselves. Christianity says: Be righteous through a power implanted in you from above; through the power of a life-giving principle, freely given to you, and always abiding in you.' The Buddha said to his followers:—'Take nothing from me, trust to no one but yourselves.' Christ said, and says to us still:—'Take all from Me; take this free gift; put on this spotless robe; eat this bread of life; drink this living water.' He who receives a priceless gift is not likely to insult the Giver of it. He who accepts a snow-white robe is not likely willingly to soil it by impure acts. He who tastes life-giving bread is not likely to relish husks. He who draws deep draughts at a living well is not likely to prefer the polluted water of a stagnant pool. If any one, therefore, insists on placing the Buddhist and Christian moral codes on the same level, let him ask himself one plain question: Who would be the more likely to lead a godly, righteous, and sober life—a life of moderation and temperance—a life of holiness and happiness; the man who has learnt his morality from the extinct Buddha, or the man who draws his morality and his holiness from the living, the eternal, the life-giving Christ?

"Still, I seem to hear some one say, 'We grant all this, we admit the truth of what you have stated; nevertheless, for all that, you must allow that Buddhism conferred a great benefit on India by

setting free its teeming population, before entangled in the meshes of ceremonial observances and Brahmanical priestcraft.' Yes, I admit this; nay, I admit even more than this. I admit that Buddhism conferred many other benefits on the millions inhabiting the most populous part of Asia. It promoted progress up to a certain point; it preached purity in thought, word, and deed (though only for the accumulation of merit); it proclaimed the brotherhood of humanity; it avowed sympathy with social liberty and freedom; it gave back much independence to women; it inculcated universal benevolence, extending even to animals; and, from its declaration that a man's future depended on his present acts and conditions, it did good service for a time in preventing stagnation, promoting activity, and elevating the character of humanity.

"But if, after making all these concessions, I am told that, on my own showing, Buddhism was a kind of introduction to Christianity, or that Christianity is a kind of development of Buddhism, I must ask you to bear with me a little longer while I point out certain other contrasts, which ought to make it clear to every reasonable man how vast, how profound, how impassable is the gulf separating the true religion from a mere system of morality, founded on a form of pessimistic philosophy. And, first of all, let us note that Christ was God-sent, whereas Buddha was self-sent. Christ was with His Father from everlasting, and was in the fulness of time sent by Him into the world to be born of a pure virgin, in the likeness and fashion of men. Buddha, on the contrary, by a force derived from his own acts, passed through innumerable bodies of gods, demi-gods, demons, men, and animals, until he reached one out of numerous supposed heavens, and thence by his own will descended upon earth, to enter the side of his mother, in the form of a white elephant. Then Christ came down from heaven to be born on earth in a poor and humble station, to be reared in a cottage, to be trained to toilsome labour as a working man. Buddha came down to be born on earth in a rich and princely family; to be brought up amid luxurious surroundings, and finally to go forth as a mendicant, begging his own food and doing nothing for his own support. Then, again, Christ as He grew up, showed no signs of earthly majesty in His external form, whereas the Buddha is described as marked with certain mystic symbols of universal monarchy on his feet and on his hands, and taller and more stately in frame and figure than ordinary human beings. Then, when each entered on his ministry as a teacher, Christ was despised and

rejected by kings and princes, and followed by poor and ignorant fishermen, by common people, publicans, and sinners ; Buddha was honoured by kings and princes, and followed by rich men and learned disciples. Then Christ had all the treasures of knowledge hidden in Himself, and made known to His disciples that He was Himself the Way and the Truth, Himself their Wisdom, Righteousness, Sanctification, and Redemption ; Buddha declared that all enlightenment and wisdom were to be attained by his disciples, not through him, but through themselves and their own intuitions, and that, too, only after long and painful discipline in countless successive bodily existences. Then, when we come to compare the death of each, the contrast reaches its climax, for Christ was put to death violently by wicked men and died in agony an atoning death, suffering for the sins of the world at the age of thirty-three, leaving behind in Jerusalem about one hundred and twenty disciples after a short ministry of three years ; whereas Buddha died peacefully among his friends, suffering from an attack of indigestion at the age of eighty, leaving behind many thousands of disciples after forty-five years of teaching and preaching. And what happened after the death of each ? Christ the Holy One saw no corruption, but rose again in His present glorified body, and is alive for evermore. Nay, has life in Himself ever-flowing in life-giving streams towards His people. The Buddha is dead and gone for ever ; his body, according to the testimony of his own disciples, was burnt, more than 400 years before the Advent of Christ, and its ashes distributed everywhere as relics. Even according to the Buddha's own declaration he now lives only in the doctrine which he left behind him for the guidance of his followers. And here again in regard to the doctrine left behind by each, a vast distinction is to be noted. For the doctrine delivered by Christ to His disciples is to spread by degrees everywhere until it prevails eternally. Whereas the doctrine left by Buddha, though it advanced rapidly by leaps and bounds, is, according to his own admission, to fade away by degrees, till at the end of 5,000 years it has disappeared altogether from the earth, and another Buddha must descend to restore it.

“ Then that other Buddha must be followed by countless succeeding Buddhas in succeeding ages, whereas there is only one Christ, who can have no successor, for He is still alive and for ever present with His people. ‘ Lo, I am with you alway, even unto the end of the world.’ Then observe that, although the Buddha's doctrine was ultimately written down by his disciples in certain collections

of books, in the same manner as the doctrine of Christ, yet that a gulf of difference—a fundamental difference of character—separates the Sacred Books of each, the Bible of the Christian and the Bible of the Buddhist. The Christian's Bible claims to be a supernatural Revelation, yet it attaches no mystical talismanic virtue to the mere sound of its words. On the other hand the characteristic of the Buddhist Bible is that it utterly repudiates all claim to be a supernatural revelation; yet the very sound of its words is believed to possess a meritorious efficacy, capable of elevating anyone who hears it to heavenly abodes in future existences. In illustration I may advert to a legend current in Ceylon, that once on a time 500 bats lived in a cave where two monks daily recited the Buddha's law (the recitation being called 'Bana'). These bats gained such merit by simply hearing the sound of the words that when they died they were all re-born as men and ultimately as gods.

"But, again. I am sure to hear the admirers of Buddhism say—Is it not the case that the doctrine of Buddha, like the doctrine of Christ, has self-sacrifice as its key-note? Well, be it so. I admit that the Buddha taught a kind of self-sacrifice. I admit that it is recorded of the Buddha himself that on one occasion he plucked out his own eyes, and that on another he cut off his own head, and that on a third he cut his own body to pieces, to redeem a dove from a hawk. But note the vast distinction between the self-sacrifice taught by the two systems. Christianity demands the suppression of selfishness. Buddhism demands the suppression of self, with the one object of extinguishing all consciousness of self. In the one the true self is elevated and intensified. In the other the true self is annihilated by the practice of a false form of non-selfishness, which has for its final object the annihilation of the Ego, the utter extinction of the illusion of *personal* individuality.

"Then note other contrasts. According to the Christian Bible, regulate and sanctify the heart's desires and affections. According to the Buddhist, suppress and utterly destroy them if you wish for true sanctification. Christianity teaches that, in the highest form of life, *love* is intensified. Buddhism teaches that, in the highest state of existence, all love is extinguished. According to Christianity, go and earn your own bread, support yourself and your family. Marriage, it says, is honourable and undefiled, and married life is a field on which holiness may grow and be developed. Nay, more. Christ Himself honoured a wedding with his presence,

and took up little children in His arms and blessed them. Buddhism, on the other hand, says, Avoid married life ; shun it as if it were a burning pit of live coals ; or, having entered on it, abandon wife, children, and home, and go about as celibate monks, engaging in nothing but in meditation and recitation of the Buddha's Law—that is, if you aim at the highest degree of sanctification. And then comes the important contrast, that no Christian trusts to his own works as the sole meritorious cause of salvation, but is taught to say, I have no merit of my own, and when I have done all I am an unprofitable servant. Whereas Buddhism, on the contrary, teaches that every man must trust to his own merits only. Fitly do the rags worn by its monks symbolise the miserable patchwork of its own self-righteousness. Not that Christianity ignores the necessity for good works ; on the contrary, no other system insists on a lofty morality so strongly, but only as a thank-offering—only as the outcome and evidence of faith—never as the meritorious instrument of salvation.

“ Lastly, I must advert again to the most important and essential of all the distinctions which separate Christianity from Buddhism. Christianity regards personal life as the most precious, the most sacred of all possessions, and God himself as the highest example of intense personality, the great ‘I am that I am,’ and teaches us that we are to thirst for a continuance of personal life as a gift for Him ; nay, more, that we are to thirst for the living God Himself and for conformity to His likeness ; while Buddhism sets forth as the highest of all aims the utter extinction of personal identity—the utter annihilation of the Ego—of all existence in any form whatever, and proclaims, as the only true creed, the ultimate resolution of everything into nothing, of every entity into pure non-entity. What shall I do to inherit eternal life ? says the Christian. What shall I do to inherit eternal extinction of life ? says the Buddhist. It seems a mere absurdity to have to ask, in concluding this address, Whom shall we choose as our guide, our hope, our salvation—‘the Light of Asia,’ or ‘the Light of the world’ ? the Buddha, or the Christ ? It seems mere mockery to put this final question to rational and thoughtful men in the nineteenth century :—Which book shall we clasp to our hearts in the hour of death—the book that tells us of the extinct man Buddha, or the Bible that reveals to us the living Christ, the Redeemer of the World ? ”

THE
HISTORICAL RESULTS
OF THE
EXCAVATIONS
AT
BUBASTIS.

BY
EDOUARD NAVILLE.

A PAPER READ BEFORE THE VICTORIA INSTITUTE.

AUTHOR'S COPY.

*THE HISTORICAL RESULTS OF THE EXCAVATIONS
AT BUBASTIS.* By EDOUARD NAVILLE.

THE King of Babylon had led into captivity part of the population of the kingdom of Judah; the inhabitants of Jerusalem had turned a deaf ear to the warnings of the prophet Ezekiel, and the threatened judgment had fallen on them. Standing near the river Chebar, in a strange land, the prophet turns for a while from his unfortunate countrymen, and, looking towards the neighbouring nations, predicts that some day the storm will burst upon them. The curse of Egypt is one of the most striking and the most terrible. Thus saith the Lord God : " I will also destroy the idols, and I will cause the images to cease from Noph; and there shall be no more a prince out of the land of Egypt; and I will put a fear in the land of Egypt. And I will make Pathros desolate, and will set a fire in Zoan, and will execute judgments in No. And I will pour my fury upon Sin, the stronghold of Egypt; and I will set a fire in Egypt; Sin shall be in great anguish, and No shall be broken up: and Noph shall have adversaries in the day-time. The young men of Aven and of Pi-beseth shall fall by the sword: and these cities shall go into captivity " (Ezek. xxx. 13-18).

It is interesting to notice the cities which are mentioned by

the prophet. They are clearly the most important, and those which were best known to his countrymen. I shall not insist here on several of these names, which differ according to the translations, but I should like to direct your attention to this sentence: "The young men of Aven and Pi-beseth shall fall by the sword." Aven (Heliopolis) is well known; but what is Pi-beseth (Bubastis)? It is one of the localities which are most frequented by travellers, or at least near which hundreds and thousands constantly pass. Whoever goes from Cairo to Suez is obliged to stop at Zagazig, a junction of several lines. Before reaching the station and after leaving it, the railway skirts large mounds covered with ruins of brick walls, which mark the site of Bubastis. The mounds, even now, cover a considerable surface, though they are much reduced from what they were. Of the 4,000 acres which they occupied at the beginning of this century, the greater part has been levelled, and is now cultivated; there are now only 800 acres left, and they are diminishing every day.

Several Egyptologists have visited the place. The opinion generally prevailing being that the temple had entirely disappeared, leaving no other traces than a few blocks scattered here and there in a great depression, which was the site of the building. Mariette had attempted excavations, which had proved fruitless; and one might reasonably think that the temple of Bubastis, which, according to the description of Herodotus must have been of considerable size, had suffered the same misfortune as many others; that it had been quarried out entirely, and the stones all carried away for building or for agricultural purposes. I shall not recall here the reasons which induced me to settle at Bubastis with Mr. Griffith in the spring of 1887, and to begin excavations. Our first attempts soon showed that the temple had not disappeared; on the contrary, the earth concealed heaps of granite blocks and gigantic columns, which reminded one of what is seen in the ruins of Sān. Our task, therefore, was to lay bare all this field of ruins, the extent of which we could judge to be considerable, and we applied ourselves to this work during the winters of 1888 and 1889. Not only did we remove all the earth which covered the stones, but in order to be quite certain that nothing was left hidden we pulled down the heaps of stones which had been piled up by the fall of the walls of the two first halls. We rolled and turned every block, and this long and costly, but sometimes most exciting, proceeding has given us inscriptions and monuments of the greatest value.

Standing at the entrance on the eastern side, one overlooks

now a field of ruins, which is still most impressive, although not so much so as last year, since a great many interesting monuments have been carried away. A space of the length of 600 feet is covered with enormous granite blocks, capitals of columns, fragments of Hathor heads and broken statues of colossal size. The general form of the temple is still discernible. It consisted of four halls, the dates of which differ. The first, from the east, which is perhaps the most ancient, had at the entrance two enormous columns with palm capitals; outside the door were the two great Hyksos statues, one of which is now in the British Museum. Beyond was a second hall, also very old. After the time of Osorkon II. it was called the "festive hall," in memory of a great religious ceremony which took place in the twenty-second year of his reign. Further west still was the most luxurious part of the temple: a hall supported by columns with lotus or palm-leaf capitals, and by pillars ending in a beautifully-sculptured Hathor head, the best specimen of which is now in the Boston Museum. The termination of the temple was a room of a very extensive area, probably the largest of the four; it was never finished, and at the end was the shrine of the goddess Bast, an exquisite piece of sculpture, fragments of which are to be seen in the British Museum.

Except Tanis, a city which in many respects has a great resemblance to Bubastis, there is no city in the Delta which has yielded so many monuments, of such very different epochs, varying from the Fourth dynasty to the Ptolemies. I must say I do not believe one could easily find excavations more interesting, and at times more exciting, than these. A circumstance which added to the surprises and to the unforeseen, is, that there is no temple which has gone through such frequent and complete transformations, and where the usurpation is so easily discernible and has been practised on such a large scale. You have heard of the mania of Rameses II. for writing his name everywhere, no matter who was the author of the monument on which he desired to record his memory. The occasions in which the name of Rameses II. is met with in the temple of Bubastis are nearly innumerable. I have examined with the greatest care the colossal architraves on which his name is written in hieroglyphics more than two feet high, and I have not found one of them which was not a usurpation; everywhere an old inscription had been erased; what Rameses II. really added to the temple is probably not considerable, though at first sight one would think that hardly anything had existed before his reign.

One of the results of the excavations is to show that

Bubastis was already a large city at a very remote date, and that it went through the vicissitudes which have marked the history of Egypt. It must rank between Tanis in the north, and Heliopolis further south; and in the narratives of the events which took place in Lower Egypt, we must take account of the presence of a great city at the entrance of the valley called the Wadi Tumilât, the highroad from Egypt to Syria.

Let us go back to the dawn of the history of Egypt. Manetho says, that under the first king of the Second dynasty, a chasm opened itself near Bubastis, in which a great many people lost their life. We do not go quite so far back in our discoveries, but the Old Empire has left important traces in the two first halls. Before having moved one single block, we could see on the top of the ruins of the entrance hall a stone where was sculptured a false door, such as is constantly met with in the tombs of the Old Empire, namely, two door posts, between which is a large roll generally bearing the name of the deceased. How that kind of ornament occurs in a building without funerary character, I cannot explain; however it is to be traced to the Old Empire, but I could not make out which king had it made, for his cartouches have been so carefully erased, that there remain only the top of the oval and a disk. The subsequent researches in that part of the building have not been fruitless; we have unearthed the standard of Cheops, and the standard and name of Chefren, the constructors of the two great pyramids, who have both written their name in the temple of Bubastis in large and beautiful hieroglyphs; the great antiquity of the temple is thus well established. In the second hall we found, in 1887, the cartouche of a king of the Sixth dynasty, Pepi, and not only his name, but his titles which he engraved on what must have been the entrance of a room. At the beginning of this century, Burton had discovered the name of Pepi further north, at Tanis; a doubt had been expressed whether it was the king himself who had extended his constructions so far north, or whether perhaps in later years a stone bearing his name had been brought to Tanis with building material, by Rameses II. or some other king; but now the doubt is no longer possible. It is not in Tanis only, but also in Bubastis, that stones bearing the name of Pepi are found, and here there are several, fitting together, and the remains of a construction may be traced; besides, Pepi is in company with two other kings, a great deal more ancient. Thus the foundation of Bubastis carries us back to the beginning of the historical times of Egypt, and is contemporary with the pyramids, its oldest monuments.

It is to be noticed that the three early kings whose names we met with were conquerors, or, at least, warriors, who fought against the inhabitants of Sinai. What may have been the motive of these struggles? Perhaps the possession of mines of copper, which have been worked from a high antiquity in the peninsula, or perhaps also the quarries; for it is an interesting question, and one which has not yet been solved in a satisfactory way, where the stones came from with which some of the Egyptian monuments are made, especially black granite. It has always been admitted that it came from the quarries of Upper Egypt, situated in the Arabian desert, at a place now called Hamamât, between the present cities of Kench and Kosseir. This explanation, which holds good in the case of kings who had the command over the whole land of Egypt, is not to be accepted for kings like the Hyksos, who ruled only over Lower Egypt, and were at war with the native princes of Thebes. Where was the stone quarried for the great statue which is now in the British Museum? The solution of this question is rendered more interesting by the fact that in the last discoveries of very early Chaldæan monuments, at a place called Telloh, in Lower Babylonia, it has been noticed that for several of them the stone is the same as that used for some Egyptian statues. The eminent Assyriologist, Dr. Oppert, maintains that this material was found in the country, called in the cuneiform inscriptions *Maggan*, namely, the Sinaitic peninsula and the part of Egypt near the Red Sea, while other Assyrian scholars think that it came from the coast of the Persian Gulf. The question is an open one, to be settled only by geologists, who will allow me to direct their attention to the search for the quarries of the Sinaitic peninsula.

Two of the kings whose names have been recovered at Bubastis, Cheops and Pepi, are mentioned in a text of a much later epoch relating the construction of the temple of Denderah. We read there in two Ptolemaic inscriptions the following words: "The great foundation of Denderah. The repair of the monument was made by King Thothmes III., as it was found in ancient writings of the days of King Cheops." And further: "The great foundation of Denderah was found on decayed rolls of skins of kids in the time of the followers of Horus. It was found in a brick wall on the south side, in the reign of the King Pepi." We must not attribute too great an importance to inscriptions which have a legendary character, but they indicate that the authority of Cheops and Pepi extended over Upper Egypt: and we know now through the excavations at Bubastis that Cheops and Chefredjef reigned

also over the Delta, certainly over the eastern part. Before our excavations their names had never been found north of Memphis; it appears now that at this remote epoch their kingdom had already reached what I should call the natural limits of Egypt.

The Fourth dynasty,—the dynasty of Cheops and Chefren,—was one of the most powerful of the Old Empire, and it seems that under the succeeding one the kingdom was rather weakened; but there is a marked revival under one of the first kings of the Sixth dynasty,—Pepi Merira. As I said before, his cartouche has been found twice at Bubastis, in a different form from what it is at Tanis. There he gives himself only as the son of Hathor, the goddess of Ant (Denderah). At Bubastis, on the contrary, he is anxious to affirm that he is son of Tum, the god of On (Heliopolis), and of Hathor, the goddess of Ant. The geographical names must not be taken in a literal sense, as meaning only two cities; they must be interpreted in their mythological sense, as meaning the two parts of Egypt. Pepi indicates in this way that he is lord of the whole country.

Under the Old Empire there was a temple at Bubastis, but although we found traces of it in the two first halls, it is not possible even to conjecture what were its forms and dimensions. It lasted very late down to the Twelfth dynasty; one of its kings,—Useratesen I.,—wrote on one of the stones a small inscription, not very deeply cut, such as the kings often did to record that they had gone through a city and presented offerings to the gods, but not that they had made any great building. The venerable sanctuary of Cheops and Pepi was still standing at his time.

Here arises a question which I am obliged to answer in a different way from what I have recently seen printed in several papers. Among the numerous statues discovered at Bubastis—Is there one which may be considered as a work of the Old Empire? The opinion that this is the case has been expressed at a meeting of the Egypt Exploration Fund. It has been said that we have a portrait of Cheops in one of the statues now in the British Museum. Among the monuments brought from Bubastis you will notice the colossal torso, in red granite, of a standing king who holds in his left hand a standard. The statue has no head-dress; it has very thick and crisp hair, not unlike what we see on sculptures or statues of the Old Empire. The figure was destined to support something, for the top of the head is quite flat, showing that some piece of architecture rested upon it. It is not the only one of its kind. We found four absolutely

alike in type, workmanship, and size; two of them have been carried away, one to Boston, the other to the British Museum; two others are still *in situ*. They all bear the name of Rameses II., but we know well enough that this does not prove anything as regards their origin. However, I do not believe that they belong to the Old Empire. What strikes one in looking at those monuments is the total absence of all that constitutes the portrait: there is nothing individual, nothing characteristic of one person. The face is broad, very short, rather flat with projecting eyes: there is no finish in the workmanship. It is true that the statue being of colossal size, the features were to be seen at a distance, and the effect would probably be better if we saw them replaced at the height at which they originally stood. It is very likely that they were placed on each side of two doors in the festive hall. Statues of the same kind have been found at Sān, at Ramleh, at Tel el Yahoodieh; one which is in the museum of Turin is supposed to come from Sān; thus, they were all discovered in the Delta. In my opinion they are statues which had only an architectural purpose, and which are no more portraits than the caryatids which adorn some of our buildings; they are mere ornaments on which Rameses II. wrote his name, although the features are as different as possible from the fine type of the Ramessides. I am ready to admit any amount of usurpation from Rameses II.; but I do not believe in the high antiquity of those statues; theirs is a style which dates from the Nineteenth dynasty, from Rameses II., and which was continued by his son Menephtah, and even later; and this peculiar style was executed by artists of the Delta, whose skill at that time was still sufficient for the requirements of architecture. I am led to this conclusion by the fact that these statues are too much alike; they are all cast in the same mould, it is a common type of face, which is copied from the one to the other without individual character. It is in accordance with the custom of Rameses II., whose main desire was to have a great number of monuments; he did not look too closely at the artistic side, provided they were numerous. In this case, when he wrote his name on these statues, he did not speak an untruth; they are his work. As for the workmanship, it must not be forgotten that such statues are seen only in the Delta. Local taste and local fashion are very important factors in Egyptian art, which have been too often overlooked; they existed in former times as they are still to be found at the present day. Evidently the taste of the sculptors of Bubastis or Tanis was not exactly the same as among the artists of Thebes or Abydos.

The Twelfth dynasty is certainly one of the most powerful in Egyptian history. Let us consider its political action—its conquests carried far on the Upper Nile—and we shall form a high opinion of the character of its kings; but our admiration will be increased if we look at the immense constructions raised by them all over the country. Manetho calls them Diospolites, giving them Thebes as birth-place. They were the founders of the great temple of Amon, and they worked most actively in the province called the Fayoom. I need only mention the Labyrinth and Lake Moeris. The recent excavations made by Mr. Flinders Petrie and myself have shown that they gave a great importance to the Delta, especially to its eastern part. Tanis was already known as a locality where their monuments were abundant; but we have added three more: Amem, a dependency of the nome of Tanis excavated by Mr. Flinders Petrie, and some monuments of which are at the British Museum; Khataanah, of which we do not know the old name; and lastly, Bubastis. It is probable that further explorations will reveal more monuments of the Twelfth dynasty in the Delta, either by actual discoveries or by showing that usurpation has been practised on their work by later sovereigns, who attributed to themselves the work of their glorious predecessors.

Amenemha I. is the first king of the Twelfth dynasty whose name occurs at Bubastis. It is engraved on a stone removed from its original place, and employed by Nectanebo I. in the construction of the western part of the temple. The name is not complete; we have only the standard and the beginning of an inscription saying that “he erected a statue to his mother Bast; he made the hall. . . .” Evidently he enlarged in some way the sanctuary of the Old Empire. After him Usertesen I., well known by the obelisk of Heliopolis, did not go on building; his name occurs on what was very likely part of the temple of Cheops and Pepi.

The most important transformation of the temple seems to have been made by Usertesen III., whose cartouche occurs several times and in very large proportions. Not only did he enlarge the two halls, of which this temple consisted, but he added to it what must have given to the whole building that character of beauty which struck Herodotus so vividly, for the Greek traveller says that “though other temples may be grander, and may have cost more in the building, there is none so pleasant to the eye as this of Bubastis” (Rawlinson, *Herod.*, ii. ch. 137). In my opinion, Usertesen III. added to the temple the hypostyle hall, the magnificent building of which remains are now in the British Museum and at Boston.

Unfortunately it is now so much ruined, having been so long used as a quarry, that it is difficult to obtain an exact idea of its form. It is nearly certain that the roof was supported by alternate rows of columns and square pillars, ending in a Hathor head. In the centre were four large columns of red granite, with capitals in the form of lotus buds, and with shafts representing a bundle of those plants. The inhabitants of Liverpool had the opportunity, a short time ago, of seeing on the quay two fragments of one of those columns, a perfect capital, and the piece of the shaft fitting immediately underneath, the whole having a length of about 20 feet; and I dare say they will have been struck, not only by the size of the monuments, but also by the vigour of the work and the beautiful polish, which has lasted to the present day. Outside of those columns were square pillars surmounted by the head of the goddess Hathor, a woman's face surrounded by great locks and having ears of a heifer. The head was sculptured on two opposite sides of the pillars; on the two others was seen the plant of Upper and Lower Egypt standing between two crowned asps. One specimen only of these fine pieces of art has been preserved complete; it is now in the Museum at Boston. Next to these pillars came again columns of polished red granite, with graceful capitals representing palm-leaves. One of them is in the British Museum; it is nearly complete. We read on it the names of Rameses II. and Osorkon II., but the column is much older, for an inscription of Rameses is cut through an ornament of the shaft. These columns bear witness to the changes which took place in the gods to whom the temple was dedicated. Rameses II. had the name of Set sculptured on the top; Osorkon changed the figure of the god, made him a lion's head, and gave him the appearance of Mahes, the son of the cat goddess Bast. To the palm columns belonged a second set of pillars with Hathor's head, but neither so large nor so beautiful as the others. One of them has gone to the Museum at Sydney.

At the end of the Twelfth dynasty the temple consisted of the first two halls and the hall of columns (some of them were gigantic monoliths). I shall only mention that the Thirteenth dynasty, a series of princes very little known, appears also at Bubastis. The first king, Sebekhotep I., has engraved his cartouche on some large architraves. It is the first time that his name is met with in a temple. It is inscribed also on rocks in Nubia, showing that under his rule the power of Egypt was not diminished. In excavating buildings like the temple of Bubastis, it is impossible not to be struck by the facility with which the old Egyptians carried enormous

blocks of granite from the quarries of Assoan to localities in the Delta, which, no doubt, were then more accessible than now, but which could only be reached at the cost of much labour. We know what the difficulties are in our time of steam-engines and railways; my friend, Count d'Hulst, might write a book on all the troubles he experienced in the ungrateful task of transferring monuments of a total weight of about a hundred tons from Tel Basta to an English steamer in Alexandria. But in the time of the ancient Egyptians, thousands, tens of thousands of enormous blocks, colossal statues weighing near nine hundred tons, obelisks, etc., were taken out of the quarries of Assoan, floated down the Nile, and dragged through the marshes of the Delta, where they adorned the temple of Sãn, Bubastis, or Behbeit. I can assure you that when I unearthed the magnificent columns of Bubastis I did not know which was most to be admired, the perfection of the work or the power of the men, who, with scanty and imperfect mechanical means, had achieved such stupendous results.

Let us now give the dates of the principal facts which we have ascertained. In opposition to the generally-prevailing opinion, we saw that Bubastis went back as far at least as King Cheops; that is, to the year 3700 B.C., according to Brugsch's chronology. After him, Pepi, about 3200 B.C., has left important traces in the temple. We described the transformation which took place eight hundred years afterwards under the kings of the Twelfth dynasty. With the end of the Fourteenth dynasty, we have reached the 24th or 23rd century B.C., one of the most obscure periods of the history of Egypt, but also one of the most interesting, and on which the excavations of Bubastis have given us most unexpected information—I mean the invasion of the Shepherds, or Hyksos.

We read in Manetho, quoted by Josephus, the following words: "The so-called Timaos became king. Egypt during his reign lay, I know not why, under the Divine displeasure, and, on a sudden, men from the East country of an ignoble race, audaciously invaded the land. They easily got possession of it, and established themselves without a struggle, making the rulers thereof tributary to them, burning their cities and demolishing the temples of their gods. All the natives they treated in the most brutal manner; some they put to death, others they reduced to slavery with their wives and children.

Subsequently also they chose a king out of their own body, Salatis by name. He established himself at Memphis, took tribute from the Upper and the Lower country, and placed garrisons in the most suitable places . . . The general name

of their people was Hyksos, which means shepherd kings ; for *Hȝk* signifies in the sacred language a king, and *Sōs* in the demotic is shepherd and shepherds. Some say they were Arabs . . .”

Arabs or Phœnicians are the names most frequently applied to them by the ancient authors. Recent researches seem to point as their native place to Mesopotamia, where at that time important events took place. We know that about that epoch, the King of Elam, Khudur Nankhundi, invaded Babylonia, plundered the country and carried away from the city of Uruk to his capital Shushan a considerable number of statues of divinities. We cannot affirm that the invasion of Egypt by the Hyksos is connected with this particular war ; but it is probable that the struggles between the Elamites and the Mesopotamians brought about the invasion of Egypt. I do not suppose that the Elamites went as far as the Nile, but they drove out of their country a mixed multitude belonging to different races, and it overran Egypt, too weak to resist. If, as I believe, the Hyksos were Mesopotamians, they were not barbarians : they belonged to nations which had already reached a high degree of civilization, and which in particular were well skilled in the art of sculpture. There is no doubt that the conquest of Egypt must have been signalized by devastation and ruin ; it never was otherwise in the wars of Eastern nations ; but as the invaders were not barbarians, as they came from a civilized country, it explains why they soon submitted to the influence of the more refined Egyptians, and why they easily adopted the principal features of Egyptian civilization, which was not unlike their own.

The chronographers have preserved the name of several of their kings ; they are called Silites, or Salatis, Beon, Apachnas, Jannas, or Janras, Asseth and Apophis, in Egyptian Apepi. The interesting point to ascertain was whether the Egyptian documents agreed with the statements of the Greek writers as to the barbarity of the Hyksos. Were they the cruel and brutal conquerors described by Manetho ? Very likely they were at first when they attacked the country, but certainly not at the end of their domination. The name of Apepi was known long ago from a papyrus relating his struggle with a Theban prince. To Mariette belongs the honour of having first discovered his name on stone monuments. In his very successful excavations at Tanis he found the name of Apepi written on the arm of a statue, evidently older than the Hyksos king. At the same time he noticed the name on monuments of a special kind, which have since been called Hyksos monuments. They are

sphinxes with bodies of lions and human faces. The head is surrounded by a very thick mane, and the type of the features is quite different from the Egyptian. The cheek-bones are high and strongly marked, the nose wide and flat and aquiline, the mouth projecting forward with stout lips. At first sight, it is impossible not to be struck by the fact that we have there the image of a foreign race and not of native Egyptians. Thus there has been an art of the Hyksos, or rather the conquered have made the education of their masters ; for, except the characteristic foreign type, the workmanship, the style, and the attitude are absolutely Egyptian, and these monuments must have been made by Egyptian sculptors.

Besides the art, the Hyksos adopted also the writing, the language of the Egyptians ; the names of their kings are written like those of the native Pharaohs with two cartouches, the first of which was taken by them on the day of their coronation, and always contained the name of Ra. Nevertheless, they remained faithful to the worship of Set, an Asiatic divinity often called also Baal, and worshipped as well by Semites as by nations of another race like the Khetas or Hittites. Thus, under the reign of the last Hyksos rulers, except that the sovereign belonged to a foreign race, Egypt must have presented an appearance very much like what it was before : a well ordered and governed state.

It has been questioned whether the Hyksos had really attained a high degree of civilization, and whether the monuments attributed to them by Mariette were really their own work. Some Egyptologists have suggested that the strange monuments of Tanis were, perhaps, the produce of local art, or that they belonged to a much older period ; in this last case Apepi would only have usurped what had been done before him, and there would be no Hyksos style. I must say that when I went for the first time to Tanis, I very nearly adopted this view ; but the discoveries made in the excavations of 1888 have convinced me that Mariette's opinion was the truth. There has been a Hyksos art, and kings of later time have not hesitated in taking possession for themselves of what the so-called barbarians had made. I had the good fortune in 1888 of finding three of the most interesting Hyksos monuments which have been preserved.

We were working in the eastern part of the temple of Bubastis near the entrance, when the workmen unearthed first the head-dress of a statue, in black granite, wearing the royal asp ; underneath were only the forehead and the eyes, for the head had been broken horizontally at the height of the origin

of the nose. The head-dress was absolutely that of an Egyptian king, and the height of the whole head could be estimated as more than three feet. The next day, to our great joy, the lower part of the head was discovered; it was complete, except a fragment of one of the cheeks and one of the ears, and we recognised at once the Hyksos type; there was the projecting mouth, the thick and curved nose, the strongly-marked cheek-bones, the cheeks themselves being rather hollow. It was the first time that the head of a Hyksos king was discovered wearing a thoroughly Egyptian head-dress, which rendered more conspicuous the strange type of the foreign race. At the distance of a few feet a broken fragment of black granite was emerging out of the ground, and on digging a few inches it was easy to recognise that it was the lower part of the legs of a colossal statue, which clearly belonged to the same monument as the head. I could not excavate immediately. It was the beginning of March, and the soil was still so full of infiltration-water that beyond a certain depth we were in ponds of water, which hampered the work considerably. I waited a few weeks; the water sank, and my impatience grew in proportion. At last, although there was still much water, I ordered that the base of the statue should be cleared and dragged out. The first thing to be done was of course to make room around it. Our surprise was immense when this revealed to us the lower part of a colossal torso close to the base we were endeavouring to drag out; and a few feet to the south, very near the place where we had found the broken head, the base of another statue of the same size, lying on the side and showing the whole of one leg. Thus it was not one but two statues which had stood there; we had two bases, we could reasonably hope that we should discover another head. The one we had, the Hyksos, was broken, perhaps the other might be intact. From that moment the researches grew intensely interesting. I promised a good baksheesh to the workmen if the head was discovered; and a few hours afterwards, while I was in another part of the temple, I suddenly heard them shouting: *rās, rās*,—the head, the head! I shall never forget this sight, nor this hour, perhaps the most impressive I went through during my five winters of excavation. It was late in the afternoon; out of a pond of water, between the base and the torso, emerged the top of a head and the royal asp, the upper part only had been cleared and was visible above the water. There was no place for us to stand, or rather to kneel, except on that head, which we did in turn, Count d'Hulst and I; and while the excited workmen drove out with their hands the water which was coming

out of the earth in streams, or took away the mud in which the face was buried, we felt anxiously with the hand how far the features were preserved. There is the forehead, the eyes, the origin of the nose, but here a fracture. . . I had one instant of despair, but no, it is only a slight wound; here are the nostrils, the mouth, the beard! The head is perfect! It was nearly dark; we let the water cover it again entirely, and the next morning we raised triumphantly our treasure, which now stands in the British Museum.

A few days afterwards two illustrious visitors,—Dr. Schliemann and Dr. Virchow,—came to see the excavations. Dr. Virchow had careful measurements taken of this head, which he published shortly afterwards in his paper on the royal mummies. His conclusion is that the Hyksos monuments must be considered as representing Turanians, without being able to determine with which branch of this very large stock they must be connected. It was the same as the conclusion put forward in this country by Prof. Flower, who sees in the monuments of Sān a Mongoloid type. Turanians or Mongols,—such is the racial origin attributed to the Hyksos by high authorities; but that does not mean that the population itself was Turanian. The worship of Set Baal, the influence of the Hyksos invasion over the customs of Egypt, and especially over the language, points clearly to a Semitic element which was prevailing among the conquerors, though their kings,—at least those who left us their portraits,—were evidently not Semites. I believe, generally speaking, that too much importance has been given to the question of race; too often sharp distinctions have been drawn between nations, or in the midst of one people,—distinctions which were perhaps true originally, but which afterwards, if they were not quite obliterated, were only to be traced in political or social life. Races have become mixed and have amalgamated much earlier than we think. I said that I believed the Hyksos to be Mesopotamians. The researches of Assyriologists all agree that from a very early epoch the population of Babylonia consisted of several strata of populations having each a different origin. It was then what it is now; and I believe that the conquest of Egypt by the Hyksos is not unlike what would happen at the present day if the population of Mesopotamia overran the valley of the Nile; you would have masses, in great majority of Semitic race, speaking a Semitic language, having a Semitic religion, and being under the command of Turks, who are not Semites but Turanians.

I revert to the two Hyksos heads. The first, which was broken in the middle, is in the Boulak Museum; it is of exactly

the same type and proportions as that in the British Museum, but the face is not quite the same; it is evidently an older man; it has the advantage of having preserved the curve of the nose. If the two heads represent the same man at two different ages, the Boulak head was made the last. We took also to Boulak all that remains of the statue, the base, which turned out to have been split in two in the direction of the height, so that there is only one leg left. As for the statue of the British Museum, unfortunately it is not complete. Although last winter we left not an inch of ground unturned in the vicinity of the place where we had found the other fragments; although we went to a great depth, we could not discover the only piece wanting, the upper part of the torso from the waist to the neck. Nevertheless, I have no hesitation in saying that such as it is the statue is one of the most precious Egyptian monuments which have been preserved. Allow me to recommend you to go to the British Museum to look at it. You will notice that the Hyksos artists, or at least the Egyptians who worked for the Hyksos, followed the traditions of the early sculptors who had portrait statues to make. The workmanship of the lower part of the body is much inferior to that of the upper part, and especially of the head. This fact is general in the statues of the Thirteenth dynasty, whether they have preserved their original name, like the Sebekhotep of Paris, or whether they have been usurped by Rameses II., like the statue of this king which I found at Bubastis, and which has been given to my native city. All the care of the artist has been bestowed on the head, all his skill has been devoted to making a likeness as good as possible. Consider attentively the face, look at the beautifully-modelled features, the special care which the artist has taken to reproduce all the characteristic signs of the race, the strongly-marked cheek-bones, the stout and projecting lips, the somewhat hollow cheeks, the fleshy corners of the mouth; if you bear in mind that this has been cut in an extremely hard stone, you will agree with me that this head, regardless of its historical value, is a work of art, and even a masterpiece.

But whose portrait is it? which name are we to give to this statue? There is no doubt that it represents a shepherd king, but has his cartouche been found anywhere on the monument? Unfortunately not. The two statues which were near each other at the entrance of the temple had both the cartouches of the king who raised them engraved on the throne along the legs. But they shared the common fate which befel so many interesting monuments; the names were cut out.

Rameses II. when he worked at Bubastis, finding that the two statues made a good effect, and that it was unnecessary to have new ones of such a large size, erased the name of the Hyksos king, and put his own instead. A long time afterwards, Osorkon II. treated Rameses II. in the same way as he had done his predecessor; he erased Rameses II., but not so completely that we may not discover a few signs, and he put his own on the base. What has completely disappeared is the name of the Hyksos king, which would be most interesting to us. Fortunately, in another part of the temple I discovered on a door-post a very large cartouche containing the name of Apepi, the same who had been found by Mariette at Tanis, with a fragment of inscription saying, that "he raised pillars in great number and bronze doors to this god,"—we do not know which. Quite recently, in the first hall not very far from the great statues, I discovered the first part of his name, what is called his standard. As Apepi was a powerful king, though he was one of the last Hyksos, and as we know from the inscription that he raised important buildings at Bubastis, it is probable that it was he who erected the great statues, and that the fine head which is now at the British Museum is the portrait of Apepi. This interests us particularly, because the Byzantine chronographer, Syncellus, relates that Apepi was the king in whose reign Joseph rose to the high position described in Genesis. According to the Christian tradition, Apepi was the Pharaoh of Joseph.

But we were not at the end of our surprises. Close to the block bearing the name of Apepi, there appeared one day the corner of a black granite stone, which, after being cleared, turned out to be the base of a sitting statue of natural size, but broken at the waist. The cartouches were intact; the coronation name reads Userenra, which is not unknown, but the second Raian, or Ian-Ra, was absolutely new. The style of the statue pointed to the Thirteenth or Fourteenth dynasty. When I afterwards showed the cartouche to a learned Mohammedan, Ahmed Effendi Kemal, the only Egyptian who can read hieroglyphics, he exclaimed at once: "You have found the king of Joseph"; and when I answered that in my opinion it was Apepi, he explained to me, what I totally ignored, that, according to Arab books, the king of Joseph was an Amalekite, called Raian Ibn el Walid. I must say that I have no great faith in Arab traditions, and although at the time of the discovery my eminent countryman, Dr. Rieu, of the British Museum, wrote a letter in the *Times*, saying that he believed that there was some historical fact at the bottom of the Arab tradition, I am not quite convinced;

there are some details of the legend which shake one's confidence; for instance, this fact, which is mentioned by one of the Arab authors, that Joseph converted the king to the faith of the Mohammedans. However, it is certainly a curious coincidence to have found at the same spot the two kings who are considered as the protectors of Joseph, one by the Christians and the other by the Mohammedans. This valuable base, which is all that remains of Raian, is now in the Boulak Museum.

Between the two traditions I incline to adopt that of the Christians, as reported by Syncellus, who adds that on this point the historians are unanimous. I know we have no Egyptian monumental evidence that it was so, but until the contrary is proved, I see no reason to question the statement of Syncellus. Apepi was the Pharaoh in whose reign Joseph became the powerful minister described by Scripture. I need not dwell at great length on this subject, which was laid before this society a few years ago in a learned paper by the Rev. H. G. Tomkins. Let me only mention that Joseph was a purely civil officer, entrusted with the control and collection of revenue and of rents chiefly paid in kind. Such officers frequently occur in Egyptian inscriptions, or even in pictures, and they bear this telling title: "The Eyes and the Ears of the King."

We saw that the Hyksos raised at Bubastis great constructions, probably larger than at Tanis, the city which had been called their capital because of the monuments discovered there by Mariette. Bubastis was an important Hyksos settlement, and we have every reason to believe that the kings often stayed there; that it was one of the places of resort of Apepi and the other kings. They were thus very near the land of Goshen. I think I have proved through the excavations which I made at a short distance from Zagazig, in 1885, that the original land of Goshen was the region situate between the present city of Belbeis and Tel el Kebir, and that at the time when the Hebrews settled there it was not part of one of the provinces of Egypt. It was an uncultivated district, not divided among Egyptian inhabitants regularly settled and governed, a kind of waste land sufficiently watered to produce good pasturage, and which might be assigned to foreigners without despoiling the native inhabitants. This agrees with the information given by the two most ancient Arab translators of the Bible,—Saadiah and Abou Said. I believe even that there is an allusion to it in an Egyptian inscription of the time of Menephtah, the king of the Exodus, in which it is said that "the country

near Bailos (Belbeis) was not cultivated, but left as pasture for cattle because of the strangers." Thus there was only a short distance between the royal residence and the territory allotted to the Hebrews. Joseph settled his family near himself, in the part of the country which was best fitted for the breeding of cattle, and where probably dwelt the herds of the king, with the keeping of which they were entrusted.

But the Hyksos domination was drawing towards its close, and it is likely that Apepi was the last of the foreign rulers. We have only very scanty information on the wars which broke out between the native princes who had maintained themselves in Upper Egypt and the foreign invaders. In spite of the successes of the kings of the Seventeenth dynasty, Sekenen - Ra and Amosis, the expulsion of the Hyksos and the restoration of the Egyptian rule over the Delta took place only gradually. A queen of the Eighteenth dynasty alludes in one of her inscriptions to the harm done to the country by the strangers, and which she endeavoured to repair. An alleged proof of the fact that the Egyptian dominion was not yet regularly re-established was the supposed total absence of monuments of the Eighteenth dynasty in the Delta. Until now there was only one known,—a stone serpent found at Benha,—or a few scarabs of Amenophis III. dug out by the fellaheen at Tel Basta. The desire to settle, if possible, the question of the presence of the Eighteenth dynasty in the Delta, was one of the chief reasons which induced me to dig at Bubastis; and in this respect my expectation has not been disappointed; we have discovered important monuments of the Eighteenth dynasty at Tel Basta. Last summer, also, the fellaheen came across a large tablet of the same dynasty at Samanood, further north. In both places the monuments are later than Thothmes III. It seems very probable that the final conquest of the Delta, and the complete expulsion of the Hyksos, dates from the great wars of Thothmes III., justly called "the great," or sometimes the Alexander of Egypt. His campaigns had lasting results, not only in Egypt, but also abroad, as we know now from the curious find of cuneiform tablets made by the Arabs at Tel el Amarna last year,—that under the successors of Thothmes III. a great many Syrian cities were still tributary to Egypt, and had Egyptian governors. The most ancient mention of a king of the Eighteenth dynasty, at Bubastis, is on a stone of Amenophis II., who is sculptured standing before Amon Ra and making him offerings. We notice here, as under the following kings, that the chief divinity of the place is not Bast, but Amon. The king of the Eighteenth dynasty, who seems to have taken the

greatest interest in Bubastis, is Amenophis III. We discovered four monuments of the reign of this king: two of them are statues of the same man; unfortunately they are both headless. They are unequal in workmanship; one of them,—the largest and the finest,—is in the Boulak Museum; the other is in London. They both represent a man sitting with crossed legs, and who unrolls on his knees a papyrus, on which is written his title and his employment. The man was “prince of the first order, a friend loving his lord, chief of the works of his king in the provinces of the marsh land of the North, the chancellor and city governor, Amenophis.” The name of his king is found on the back; the braces which support his garment are tied together by a brooch, on which is engraved the name of Amenophis III.; another statue has it engraved on the shoulder, as has also a very graceful torso of a woman, which was part of a double group of a priest and priestess. Thus the Eighteenth dynasty is well represented at Bubastis,—its high officers and priests put their images in the temple. Even the heretical King Amenophis IV., or Khuenaten, who endeavoured to destroy the worship of Amon, desired his name to be at Bubastis. On a stone, usurped afterwards by Rameses II., we read the name of his god, his one cartouche having been erased.

In what state did the Eighteenth dynasty find the temple of Bubastis? Had it been ruined by the Hyksos? Not likely; on the contrary, we have seen that Apepi raised there, as he says, pillars in great numbers and bronze doors. If it did not suffer in the wars between the Hyksos and the Theban princes, the temple must have been standing and even of a remarkable beauty when the contemporaries of Amenophis III. put their statues in its halls.

Seti I., the second king of the Nineteenth dynasty, and the father of Rameses II., inscribed on the stone of Amenophis II. that “he renewed the abode of his father Amon.” He seems to have made some repairs to the temple. But with his son Rameses II. we reach a period of great changes, which consisted chiefly in usurpations. There is no name which occurs so frequently in the ruins of the first three halls, which up to the Thirtieth dynasty constituted the whole building. As is the case in Tanis, the local divinity seems to have occupied only a secondary rank; all the principal offerings or acts of worship take place before the great gods of Egypt, Amon, Phthah, called Phthah of Rameses, and chiefly Set, the god of the Hyksos, who had the most prominent place. Enormous architraves in the second hall bear dedications to Set; elsewhere he is styled Set of

Rameses, and his face was engraved on all the palm-capital columns, where it was afterwards transformed to Mahes. Nevertheless, Bast appears sometimes in the inscriptions of Rameses II.,—for instance, on a great tablet, of which we found only a part, and which is a dialogue between the king and the goddess, who makes his eulogy in words like the following: “I take in my hand the timbrel, and I celebrate thy coming forth, for thou hast multiplied the sacred things millions of times.” There is no question that Rameses II. worked much in Bubastis, but in the way which best illustrates his personal character and the tendency of all his acts. An extraordinary vanity and self-conceit, a violent desire to dazzle his contemporaries by his display, and posterity by the immense number of constructions bearing his name, seems to have been the ruling power of his conduct during his long reign. In the second hall of Bubastis there are many colossal architraves where his cartouche is engraved in letters several feet high, but there is not one of them where an older inscription has not been cut out—sometimes the old signs are still visible. In one instance, very likely because something concealed the end of the stone, the workman did not take the trouble to erase completely, and at the end of the cartouche of Rameses II. appear the first letters of the name of User-tesen III. of the Twelfth dynasty.

There is no doubt that Bubastis was a place for which Rameses felt a special liking; he was anxious that the whole temple should appear as built by himself, from the great statues of Apepi at the entrance to the columns of the hypostyle hall at the western side. I do not believe that there is any other temple with so many statues bearing the name of Rameses II. as Bubastis. Undoubtedly they have not all been made for him; two of the finest which we discovered, both in black granite, were certainly not his portrait. One of them, which is complete, has been given to the Museum of Geneva; the head of the other, a fine piece of art, has gone to Sydney; none of them has any likeness to the well-known type of Rameses; they are kings of the Thirteenth or Fourteenth dynasty. Besides those statues, there were a great number in red granite, of various proportions, and standing in different parts of the building, which have merely an ornamental purpose; we are not to look for portraits on any of them. I spoke before of the four statues with crisp hair, one of which is in the British Museum. Another, now at Boulak, wears a fine head-dress called the *atef*, two feathers resting on the horns of a ram. There were also groups representing the king sitting with one or two gods; groups of that kind were

often put outside the entrance on each side of the road. Generally speaking, it is near the entrances that the statues were more abundant. A great many disappeared already in old times, or were broken in the destruction of the temple, which must have taken place between the Ramessides and the Bubastites; a large number of them were employed by Osorkon I. and Osorkon II. as building material when they repaired the temple.

The more we study the remains of Bubastis, the more we are convinced that the place must have been one of the favourite resorts of Rameses II., where he stayed repeatedly. Bubastis and Tanis were the two great cities of the Delta, and no doubt the court came frequently to both. Rameses was accompanied by his sons; one of them, Khaemuas, who had a high rank in the priesthood, and who was inspector of the temples, has recorded his visit to Bubastis on a statue of his father. We found also mention of two others who had military commands. One, whose statue is in Boston, was "first cavalry officer of his father, the chief of the horse of his majesty, Mentuhershepshef;" the other, Menephthah, who became the king of the Exodus, was at that time a general of infantry, and he appears several times on sculptures making offerings to the god Amon.

Not far from Bubastis was a foreign nation, which from a small tribe had grown to be a large multitude, and which had never amalgamated with the Egyptians. I have already alluded before to the vicinity of the land of Goshen, only a few miles distant; but the restricted limits of the original land had been broken through, and the Israelites must have spread in the south towards Heliopolis, and in the East in the Wadi Tumilat, the road through which foreign invaders would enter Egypt. One may well conceive that Rameses who, in spite of his outward show, must have felt how much his kingdom was weakened, grew rather anxious at the presence of a great number of strangers occupying the very gate of Egypt, and that he desired to turn their presence to a benefit for Egypt. Therefore he employed them to build fortresses destined to protect the land against invaders. The Exodus describes in the following way the fear which took hold of the king: "And he said unto his people: Behold, the people of Israel are more and mightier than we: come let us deal wisely with them; lest they multiply, and it come to pass that, when there falleth out any war, they also join themselves unto our enemies, and fight against us, and get them up out of the land. Therefore, they did set over them taskmasters to afflict them with their burdens. And they built for Pharaoh store cities,

Pithom and Raamses" (Exodus i. 9-11). It was the result of my first campaign of excavation to discover the site of Pithom, not very far from the present city of Ismailiah; Raamses is not yet known; it is very likely between Pithom and Bubastis in the Wadi Tumulât. I cannot dwell at great length here on the events of the Exodus; yet I should like to mention that the successive discoveries made in the Delta have had the result of making the sacred narrative more comprehensible in many points, and especially in showing that the distances were much shorter than was generally thought. For instance, I consider it important to have established that Bubastis was a very large city and a favourite resort of the king and his family. It is quite possible that at the time when the events preceding the exodus took place, the king was at Bubastis, not at Tanis, as we generally believed.

Menephtah, the king of the Exodus, who is represented as general of infantry, also executed statues in the temple after he became king, but they are very much broken.

The Twentieth dynasty, the dynasty of the Ramessides, whose kings all bear the name of Rameses, is also represented at Bubastis. It is natural that the most powerful of them, Rameses III., should not be absent; but what is more interesting, we met with one of the later ones, who was thought to be an idle prince reigning only nominally, and entirely in the hands of his vizier, the high priest of Amon. For the first time monuments of Rameses VI. have been discovered in the Delta, showing that the power of the king still extended over the two parts of the country. I found three statues of this king: one of red granite of heroic size, standing, has been removed to the Boulak Museum; another, in black granite, is headless and is still on the spot. The kings of the Twentieth dynasty seem to have erected a construction of their own in the western part of the temple, a kind of entrance to the hypostyle hall.

After them, in the obscure period of the Twenty-first dynasty, the temple must have gone through great vicissitudes; I believe that for some reason which we do not know, perhaps in some war or rebellion of which no record has been left, it was destroyed and partly ruined. I said before that in my opinion the beautiful Hathor capitals of the hypostyle hall must be attributed to a period much more ancient than the Twenty-second dynasty. Several of these capitals have underneath, on the part which rested on the square pillow, a dedication to Bast, written by Osorkon I., a king of the Twenty-second dynasty. This dedication was not visible, and could not be

read, but it is a lasting record of the fact that Osorkon I. had done some work in connexion with these capitals. In the same way also Rameses II. put his name under the base of the obelisks he erected, in order that his memory should not perish altogether in case one of his successors should erase all the visible inscriptions of the sides. In my opinion, the inscription of Osorkon I. records, not that the king had these capitals sculptured, but that he raised them a second time, and he could not have done it if they had been standing, while if they were overthrown, and the temple was more or less in ruin, the fact is easily to be explained.

The Twenty-second dynasty is called by Manetho the dynasty of the Bubastites. It is most likely that these kings were strangers of Libyan origin; their family had the hereditary command of the guard of Libyan mercenaries, called the Ma or the Mashooash; and it is natural to suppose that it was with the aid of his foreign troops that Shishak, the first of the Bubastite rulers, succeeded in ascending the throne of Egypt. Shishak is well known as the successful enemy of Rehoboam; he conquered Jerusalem and pillaged its temples; he made great constructions at Thebes, but he does not seem to have done anything in what is considered as his native city. His name has been found only on a small fragment of limestone. The first king of the Bubastites who adorned the temple with fine sculptures is a king who was little known until now, Osorkon I. As I said before, very likely the temple was in ruins in his time; he rebuilt it, or at least he began doing so; he raised again the beautiful Hathor capitals, and went to work in the first hall, building up the walls and covering them with finely-carved sculptures, for which he used the material already on the spot, as one may judge from blocks engraved on both sides; which under Rameses II. were part of the basement, while under Osorkon I. they were at a certain height in the wall. I believe it was in his reign that a change took place in the dedication of the temple. Instead of being a place of worship for the great gods of Egypt, and chiefly for Set, of whom Rameses II. seems to have been a fervent adorer, it became the temple of Bast, the lion or cat-headed goddess, with her accompanying gods, Mahes or Nefertum, called her son, and Horheken, a special kind of Horus. I should think also that the religious custom of keeping cats in the temple and of burying them in holy ground dates from his reign. There is a considerable space in the mound of Tel Basta, which is nothing but a cemetery of cats, rectangular pits made of raw bricks, which are full of the bones of these animals, among which some bronzes have

been thrown, representing either cats or the god Nefertum, a god with a human form wearing as headdress a lotus-flower, over which are two feathers. The cemetery of cats has been known for many years to the fellahen, who dug it out entirely, and supplied the dealers in Cairo with the bronze cats which fill their shops. I attempted this year an excavation in the cemetery; I was obliged to go very deep, as all the upper pits have been rifled; under such circumstances the digging is very ungrateful business, as the water and the salt have nearly destroyed the bronzes. I emptied several pits entirely full of bones, which are quite calcined, as they are the residue of bodies burnt in furnaces still visible close to the pits. It is incredible what an immense number of cats must have been burnt, judging from the number and the size of the pits. After many difficulties we succeeded in rescuing a few skulls, which are now in the hands of the illustrious naturalist, Dr. Virchow, of Berlin. It is very likely that the holy cat of Bubastis was not the ordinary domestic cat, but some larger animal of the feline tribe, either the wild cat or a kind of lynx.

Under Osorkon I. Egypt was not an impoverished country; we may judge of it from inscriptions which are unfortunately in a very bad state, but which are due to Osorkon I. Herodotus says that about three furlongs from the great temple, towards the east, is the temple of Hermes. I found the remains of it, a few scattered blocks in a clover-field, at a short distance out of the tell. I dug there several days; there is very little left: a large architrave, with a cartouche of Rameses II., and a great many fragments all bearing the name of Osorkon I. There are fragments of a large size, belonging to a long inscription, in which Osorkon I. relates the weights of silver and of *asem* (silver gilt) which he gave to several temples; and the large quantities which he mentions remind one of the considerable offerings made to the religious establishments in the time of the great prosperity of Egypt. I believe that this second temple was the treasury of the other, and that being, as were all treasures and libraries, under the protection of Hermes Thoth, it was taken by Herodotus for a temple of Hermes.

Osorkon I. did not finish the rebuilding of the temple, and it was Osorkon II. who completed it, and who worked chiefly in the second hall. This part of the building seems to have suffered most grievously in the destruction which I presume to have taken place before the accession of the Bubastites to the throne of Egypt. When we began rolling the blocks of the enormous heap which marked the site of the hall, nearly

every one of them was found to be a fragment of a statue, or of a group which had been cut up, sometimes partly erased and afterwards walled in; one of the sides being flattened in order to engrave on it the sculptures of Osorkon II. Most of these fragments bear the name of Rameses II. Sometimes the remains of the old statue are in a fair state of preservation, such as, for instance, the block which has been given to the Museum of Liverpool, where there is on one side a very good head of Rameses; on the other, a sculpture of the sacred boat in which the emblem of Amon was carried; the piece of statue was used simply as building material, for when it was walled in, the head was turned upside down. Sometimes also we come across the feet of a colossal statue; on the base, what would be under the feet, if the statue were standing, there are sculptures of Osorkon. I do not believe all this wanton destruction was done by Osorkon intentionally; although he usurped a good number of the cartouches of Rameses, I cannot fancy that it was he who broke such a great number of statues, while he respected others bearing also the name of Rameses. I presume that the Bubastites found the temple in a state of ruin, and that they made use of what they found on the spot, leaving intact the statues which had not suffered any damage, and taking what was broken for their building, instead of fetching granite blocks all the way from Assooan. Osorkon II. was also a king very little known. I had already discovered some constructions of his at Pithom. At Bubastis he recorded one of the principal events of his life, a great festival given in the temple in the 22nd year of his reign, on the 1st of the month of Choiak. It is extraordinary that the festival is not given in the honour of Bast, but of Amon. It is evidently an old tradition which Osorkon had to follow, something which "took place since the days of his father," as he says in the inscription. It was very likely for the purpose of this festival that he re-built the second hall to which he gave the name of the "festive hall." The walls are covered with sculptures representing the scenes of the festival; unfortunately, although every block on which there was an inscription or a sculpture has been stamped or photographed, it will never be possible to make a connected description of it. The king is generally represented as a god; he sits in a sanctuary, the goddess Bast is standing before him, or he has with him his queen, Karoama, as may be seen on a large sculpture now in the British Museum. Sometimes they are accompanied by three of their daughters, whose names are given. The gods of Egypt are supposed to be present at the festival, and there are long series of them

standing each in his shrine. The priests, of whom there are a great variety, carry offerings of fishes and birds, vases,—very likely of precious metals,—or sacred standards. Sometimes they seem to execute dances, sometimes they lie quite flat on the ground, sometimes also they are accompanied by ugly dwarfs. The emblem of Amon is in his sacred boat, and is carried on the shoulders of the priests, and the king himself is sometimes borne on a litter. It is not impossible that this great festival, which, as I said, was based on an old tradition, had something to do with the calendar. Though he celebrated it in honour of Amon, Osorkon II., who in his cartouche calls himself the son of Bast, completed the dedication of the temple to the goddess; it was he who erased the name of Set, where it was still visible, and replaced it by Mahes, as it is seen on several of the columns. He had also a great desire to inscribe his name as often as possible, for it is met with nearly as often as Rameses II.

I do not insist on monuments of small importance of the Twenty-fourth and the Twenty-sixth dynasties. The most western hall, and the largest, was built by the first king of the Thirtieth dynasty,—Nekhthorheb,—the last king of the last native dynasty. In spite of the long wars which they had to wage against the Persians, the princes of the Thirtieth dynasty, said to be Sebennytes, have left us very large and important constructions, especially in the Delta. They seem to have taken as the object of their imitation the kings of the Twelfth dynasty; under their reign there is a revival of Egyptian art which is quite marvellous, and they have left us monuments which can be compared only to the works of the best period. The decoration of the western hall was not finished, but, in order to show that it was to Bast that it was dedicated, Nekhthorheb changed his cartouche, and, instead of calling himself son of Isis, as everywhere else, he is styled son of Bast. The most beautiful part of the hall was the shrine of red granite, which was at the end. Three fragments of it are now in the British Museum; the religious sculptures which cover them are of the most exquisite workmanship, and were worthy of the beautiful temple in which the shrine was deposited.

If we add to this long catalogue of monuments two Greek inscriptions referring to statues being erected by two higher officials of the time of Ptolemy Epiphanes, we shall have reached the lower limit of the period over which extend the annals of Bubastis, such as we recovered them in the excavations. We are able now to trace some of the principal events in the history of the city and the country during 3,500 years,

from Cheops down to the Macedonian kings, and we have found inscribed on statues or on the walls of the temple the names of twenty-six kings, one of whom, one Raian or Ian-ra, was absolutely unknown; besides, we have now in several museums monuments of great value, some of which, like the large statue of Apepi in the British Museum, are quite unique.

Such is the net result of a work of about six months on a spot which was thought to be absolutely exhausted, and where nothing was said to remain. This instance shows how many treasures lie still hidden in the soil of Egypt; there are even large historical cities where no serious exploration has ever been made. It is dangerous to play the prophet in matters of excavation; but who knows what may be concealed in many mounds of the Delta or of Upper Egypt, which it would be easy to name? There are still great gaps in the history of Egypt, which we hope to fill up some day, and the work of excavation is far from being closed. I trust that in relating what has been done at Bubastis I may have kindled in your minds a desire that more should be done in that way; and I beg to be allowed to warmly recommend to your interest and to your practical support the work of Egyptian Exploration.

DISCUSSION.

THE great meeting of the Victoria Institute at which M. Naville read his paper, was held July 5, 1889. The paper was illustrated by the author's photographs, shown by limelight; at its conclusion:—

The PRESIDENT (Sir George G. Stokes, Bart., M.P., P.R.S.) said:— I have now to ask you to return your thanks to Monsieur Naville for his most interesting paper, although you may be said to have already returned them by anticipation in the applause with which the paper has been received from its opening to its conclusion.

M. NAVILLE expressed his thanks for his cordial reception and the way in which his paper had been received.

Sir CHARLES T. NEWTON, K.C.B., D.C.L., heartily congratulated M. Naville on the splendid results of his labours; for himself he sought to support Egyptian exploration and the Egyptian Exploration Fund with all the influence he possessed.

Mr. REGINALD STUART POOLE, LL.D. (British Museum), said he was extremely gratified at being invited to listen to the most learned and cautious paper he had ever heard from a discoverer. M. Naville's great merit was that he never took one beyond the point to which he himself could safely go, and whenever he had differed from him he had felt perfectly sure that he was wrong and M. Naville right.

Mr. T. H. BAYLIS, Q.C., spoke of the importance of Egyptian exploration, and Mr. W. ST. C. BOSCAWEN added some remarks.

After a letter from Major CONDER, R.E., had been read, in which he drew attention to the important light M. Naville's researches threw on ~~our knowledge of~~ the history of the ancient peoples of the East.

The President, members, and their guests adjourned to the Museum, where refreshments were served.

The Victoria Institute,

OR

Philosophical Society of Great Britain.

1A, ADELPHI TERRACE, STRAND, LONDON, W.C.

Correspondence (including communications from intending Members or Associates, &c.) to be addressed to "The Secretary."

THE PRIMARY OBJECTS.

THIS SOCIETY has been founded for the purpose of promoting the following Objects, which will be admitted by all to be of high importance both to Religion and Science:—

First.—To investigate fully and impartially the most important questions of Philosophy and Science, but more especially those that bear upon the great truths revealed in Holy Scripture; with the view of reconciling any apparent discrepancy between Christianity and Science.

Second.—To associate **MEN OF SCIENCE** and **AUTHORS*** who have already been engaged in such investigations, and all others who may be interested in them, in order to strengthen their efforts by association; and by bringing together the results of such labours, after full discussion, in the printed Transactions of an Institution, to give greater force and influence to proofs and arguments which might be little known, or even disregarded, if put forward merely by individuals.

Third.—To consider the mutual bearings of the various scientific conclusions arrived at in the several distinct branches into which Science is now divided, in order to get rid of contradictions and conflicting hypotheses, and thus promote the real advancement of true Science; and to examine and discuss all supposed scientific results with reference to final causes, and the more comprehensive and fundamental principles of Philosophy proper, based upon faith in the existence of one Eternal God, who in His wisdom created all things very good.

Special advantages are secured to Country and Colonial Members and Associates in the Journal of Transactions.

The Journal of Transactions

Contains the Papers read at the Meetings and the Discussions thereon.

Before these are published in the Journal, both are finally submitted to their Authors for any revision, and MS. comments and supplementary remarks are added, which have been sent in by such British, American, and other Members to whom, as being specially qualified to contribute information upon the respective subjects, proof copies of the Papers had been submitted for consideration—the authors of Papers adding their final comments. These arrangements, which are found to add greatly to the value of the Journal, are carried out with a view to securing the special usefulness of the Journal to all, whether home or Non-resident Members or Associates; these thus find in the Journal much valuable matter, and often much (contributed by men of learning in all parts of the world) in addition to that which had come before those actually present at the Meetings. (The Journal is sent post-free.)

* The Society now consists of 1,200 Subscribers (about one-third of whom are Foreign Members); including Literary and Scientific Men and others favourable to the Objects. (The present average annual increase is upwards of a hundred.)

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The Library, Reading and Writing Rooms are open, for the use of the Members only, from ten till five (Saturdays till two). The Institute exchanges Transactions with the Royal Society and many other leading English and Foreign Scientific bodies, whose Transactions are therefore added to the Library.

ASSOCIATES—ARE ENTITLED, to the Journal, in Quarterly Parts or in the Annual Volume, for the years during which they may subscribe; to obtain the earlier Volumes or Parts at a reduced price; and to introduce one Visitor at each Meeting.

Members and Associates have the right to be present at all Meetings of the Society.

The Meetings, of which due notice is given, are held at Adelphi Terrace, at Eight o'clock on the evenings of the First and Third Mondays of the Winter, Spring, and Summer Months. Proof Copies of the Papers to be read can be had by those desirous of placing their opinions thereon before the Members (when unable to attend, they can do this in writing).

Members and Associates on 1st January, 1871, 203.—Joined since:—In 1871, 91;—1872, 109;—1873, 110;—1874, 111;—1875, 115;—1876, 107;—1877, 100;—1878, 101;—1879, 105;—1880, 104;—1881, 122;—1882, 122;—1883, 126;—1884, 109;—1885, 110;—1886, 101;—1887, Foreign, 47; Home, 62—109;—1888, Home and Foreign, 149.

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18

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CHAD BOSCAWEN, F.R. Hist. Soc.
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DAVIDS, Mr. RASSAM, Rev. S. COLES (Ceylon), &c. Also a Full Note on Krishna.
71. Pessimism. By (the late) W. P. JAMES, Esq.
On the Prehistoric Factory of Flints at Spiennes. By Rev. J. MAGENS MELLO, F.G.S.
The Evolution of the Pearly Nautilus. By S. R. PATTISON, Esq., F.G.S.
72. On "Prehistoric Man in Egypt and the Lebanon." By Sir J. W. DAWSON, K.C.M.G.,
F.R.S., McGill University, Montreal. Remarks by Sr WARINGTON W. SMYTH, F.R.S.,
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HERSCHEL, F.R.S., Dr. RAE, F.R.S.

VOL. XIX.

73. On the Inductive Logic. By Prof. R. L. DABNEY, D.D., LL.D. Speeches by Sir H.
BARKLY, K.C.B., G.C.M.G., F.R.S., Sir J. LEFROY, K.C.M.G., F.R.S., &c.
On Evolution by Natural Selection. J. HASSELL, Esq.
Remarks on Evolution by Professor VIRCHOW.
On the Recency of the Close of the Glacial Epoch. By D. MACKINTOSH, Esq., F.G.S.
Communications from Prof. T. RUPERT JONES, F.R.S., and others.
74. On the recession of Niagara (with the United States Government Survey Diagrams).

- On the Religion of the Aboriginal Tribes of India. By Professor J. AVERY. Remarks by General HAIG, Mr. H. RASSAM, and others.
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76. On the Worship and Traditions of the Aborigines of America. By Rev. M. EELLS, M.A. Remarks by Professor J. O. DORSEY, U.S. Survey. Note on Comparative Religions.

VOL. XX.

77. Special Address by the Institute's President, Sir G. G. STOKES, Bart., M.A., D.C.L., President of the Royal Society. Egypt: Physical, Historical, Literary, and Social. By J. LESLIE PORTER, D.D., D.C.L., (the late). Remarks by the Earl of BELMORE, Right Hon. A. S. AYRTON (the late), &c. On the Theory of Natural Selection and the Theory of Design. By Professor DUNS, D.D., F.R.S.E. Remarks by Right Hon. Lord GRIMTHORPE, &c.
78. On Agnosticism. By J. HASSELL, Esq. On the Structure of the Gorilla. By E. CHARLESWORTH, Esq., F.G.S.; with illustration. Notes on the Antiquity of Man. By the EDITOR. The Chronology of Animal Life on the Earth prior to the Advent of Man. By Sir J. WILLIAM DAWSON, K.C.M.G., F.R.S., President of the British Association. Historical Evidences of the Migration of Abram. By W. ST. C. BOSCAWEN, F.R.Hist.Soc., with drawings. Notes by Professor SAYCE, E. A. W. BUDGE, Esq., &c. A Samoan Tradition of Creation. Rev. T. POWELL, F.L.S. (the late); Notes on the Islands.
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VOL. XXI.—1887-8.

81. Results of an Expedition to Arabia Petraea and Palestine (with chart). By Professor F. HULL, F.R.S., Director of the Geological Survey of Ireland. Jewish, Phœnician, and Early Greek Art. By Rev. J. LESLIE PORTER, D.C.L. (the late).
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83. On Krishna. By Rev. R. COLLINS, M.A. Notes by Sir M. MONIER-WILLIAMS, K.C.I.E., Professors MAX MÜLLER, E. B. COWELL, DOUGLAS, DE LACOUPERIE, DR. LEITNER, and Dr. EDERSHEIM (the late). The Pedigree of the Coral Reefs of England. By S. R. PATTISON, F.G.S. Remarks by Sir G. G. STOKES, Bart., P.R.S. Practical Optimism. By the Most Rev. Bishop SAUMAREZ SMITH, D.D.
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A

DESCRIPTION OF CHRISTIANITY
CRITICISED,

*BEING A PAPER BY THE LATE Rt. HON. THE LORD O'NEILL,
READ AT THE ANNUAL MEETING OF THE*

Victoria Institute,

25 JUNE 1883,

BY THE LORD BISHOP OF DERRY.

*THIS EDITION INCLUDES THE SPEECHES ON THE PRESENT ASPECT
OF MODERN THOUGHT.*

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SEVENTEENTH ANNUAL REPORT OF THE VICTORIA INSTITUTE.

SIR H. BARKLY, G.C.M.G., K.C.B., F.R.S., IN THE CHAIR.

EXTRACTS FROM THE REPORT.

"IN presenting the SEVENTEENTH ANNUAL REPORT, the Council desires to state that, in spite of those adverse influences affecting all Societies, the Institute's progress at home and abroad continues to be very satisfactory. [The Institute now consists of 1,020 Home and Foreign Members and Associates; only 14 Members and 9 Associates have retired during the year.]

"The number of new American members joining does not diminish, although the Institute's American offshoot (which is an independent Society), is rapidly advancing. In Australia and South Africa a system of corresponding local secretaries has worked well, and will be extended.

"As regards the Institute's Philosophical and Scientific Investigations, an increasing number of home and foreign Members and friends now contribute to enhance their value, and aid the Institute in filling that position which its aims demand. It exchanges Transactions with many leading London Societies, whose Members—whether in its ranks or not—willingly render aid when consulted.

"The adhesion of such men as PASTEUR and WURTZ, and many others at home and abroad, has tended to render the Institute more useful 'at a time when principles which a few years ago would have been taken for granted by ninety-nine out of every hundred persons are now all of a sudden brought up for discussion, and doubt thrown upon them,' and when it is so important that accurate scientific research should be encouraged and insisted upon.

"Her Majesty the Queen, in consequence of a communication from the President, has been graciously pleased to accept the volumes of the Transactions of the Victoria Institute. It is hoped that ere long Her Majesty may become its patron. (See Vol. I., p. 31.)

"Members and others in many parts of the world have written, expressing warm approval of the Institute, and their sense of the value of the *Journal*. (See Part 65, pages 9 *et seq.*) The papers and discussions are referred to by many as especially useful by reason of their containing careful examinations of those questions of Philosophy and Science said (by its enemies) to militate against the truth of Revelation.

"A demand for the *Journal* has arisen on the part of the large Colonial and American Libraries; several have purchased complete sets.

"Spain is now added to the list of countries in which the Transactions are translated.

"The *Journal* is much used by Members and others lecturing at home, in India, and the Colonies."

THE RESOLUTIONS PROPOSED WERE:—

1. The Adoption of the Report and Vote of thanks to the Council.
2. Vote of thanks to those who had aided in the Institute's investigations during the year, and to the Bishop of Derry, for reading the late Lord O'Neill's paper.
3. Vote of condolence with the Dowager Lady O'Neill.
4. Vote of thanks to the Chairman.

Refreshments were afterwards served in the Museum.

The Transactions now extend to sixteen volumes, containing the papers and discussions thought worthy of publication. Some are purely scientific, such as the paper on the Isomorphism of Crystalline Bodies, and some take up those questions of Science or Philosophy which bear upon the truths revealed in Scripture,—these latter are taken up solely with a view to elucidating the Truth, and getting rid of such theories as might prove baseless. Purely theological questions are left for other societies, and ministers of religion.

The Right Hon. A. S. AYRTON, P.C.—I have to move : “That the Report be received, and the thanks of the Members and Associates presented to the Council, Honorary Officers, and Auditors for their efficient conduct of the business of the Victoria Institute during the year.” I am invited to move this resolution because, like most of you, I take very deep interest in the proceedings of this Society; and I enjoy, as I have no doubt many of you do also, the great pleasure of reading its proceedings from time to time. I think that those proceedings in an eminent degree grapple with the doubts and difficulties that are met with in the study of nature, and tend to satisfy the mind of any reasonable person that, instead of what are called modern discoveries and researches tending to overthrow the generally-entertained conviction that the Author of all things is God, they lead, when justly and rightly considered and reasonably examined, to the very opposite conclusion. (Applause.) In my opinion every discovery that has been well established and generally admitted has only afforded another proof of the wondrous wisdom shown in all the works of creation. The Society’s publications, I am glad to see, are being sought for and diffused in all parts of the intellectual world. It is satisfactory to know that the efforts which are made here afford in almost every part of the Queen’s dominions a new basis for thought or action, and a new means for carrying on any controversy that may have been raised by publications of a character which we have no right to condemn—because everybody has a right to say or to print what he thinks—but which we have an undoubted right to refute and to show that they are not based on the facts which have been presented to us. Such is the view I take of the efforts of the Society, and of the principal results of those efforts. For some time past, however, I have entertained a rather decided opinion, which I will take this opportunity of expressing—not with any authority, but rather as a suggestion for the consideration of the Council which manages our affairs—in regard to the desirableness of extending our sphere of operations. There are amongst our members men who perfectly understand the elaborate arguments which are necessarily used when we enter into controversy with other men of great mental capacity, who have used that capacity in writing works for the purpose of leading the public to conclusions which we do not recognise or admit. There is being diffused all over the country literature which has only one merit, namely, that it is extremely cheap—although, if a thing is bad, that which would be a merit if it were good becomes a very great element of evil. (Hear, hear.) The cheapness is not an evil, but the rapid dissemination of the contents of a cheap bad book is much to be deplored. If we are to combat this growing evil, we must do so by operating in the same manner as those whose teachings we disapprove. We must endeavour to diffuse everywhere cheap works of a kind that all people can read who can read at all, and that all who read can understand—works which can be followed without any difficulty or embarrassment, and containing arguments which can be appreciated because they are set forth in a form and style which comes home to their minds and feelings, and in a language with which they themselves are perfectly familiar. These are the

sort of works which are used in the dissemination of error ; and, if we wish to overtake and circumvent error, we must use the same methods. Our works must be as engaging and inviting—I hope, indeed, a great deal more engaging and inviting—than those which we condemn. I think this Society will do well, now that it has arrived at a certain stage of maturity, to devote its attention to the production of works of this kind. They ought to be cheaper than any of those works of evil which we desire to combat, and in this respect we ought to be able to win the battle. We start with very great advantages on our side ; and, if the works of our opponents are sold for twopence, we ought to be able to sell ours for a penny. (Hear, hear.) We ought to make use of the first attraction of all, namely, that every one can afford to buy what we can afford to sell. We are bound to ask ourselves what constitutes attraction in the minds of the many. I object to the use of any class distinctions in putting forward literary productions, such as calling them “ works for artisans,” &c. There are works which are intended for scientific minds, for the use of persons engaged in the pursuit of particular branches of learning ; but outside these, and distinguished from them, there are the books addressed to the general reader, who wishes to approach a subject without preliminary learning and to understand what he reads. This is the only distinction which should be observed. The publications I speak of ought to be prepared for the use of the general reader. If this plan were adopted, you would invite the attention of the working-man as a member of the general community, and not as one outside the community, and one to be treated in a special manner, and you would thus bring him within the brotherhood of knowledge. These works should, then, be written in the most simple and common language. I do not wish to say anything depreciatory of what is called scientific language ; but every scientific man must admit that such language, as addressed to the general reader, is little more than a jargon of two dead languages mixed up in the most unsatisfactory manner, and conveying no meaning whatever. You must, then, take a review of that which you wish to do, and you may be quite certain that if you adopt this course the work will be accomplished in a manner which will fulfil the desire that is entertained. If you start at random upon this great and very grave task, the result will be the same as it would be if you went into a shop, gave a very ambiguous order, and expected to get what you wished for—it would, in fact, generally be disappointment. I think, then, that the Council should first attempt to get a clear comprehension of the character of the work, and that they should then obtain the services of those who, from their clearness and force of expression, their knowledge and learning, would be capable of producing a review of modern science, leading, step by step, up to the conclusion we desire—that is to say, leading from nature to nature’s God. (Applause.) If time permitted, I could give, not a perfect, but a slight sketch of the sort of work I have in my mind ; but I am warned that the time at the disposal of any individual speaker is short, and if I entered further into the subject I am afraid I should go beyond the period

that is assigned to me. But in making these general observations I have a very clear conception of the whole scope and character of such a work ; how it should begin, how it should traverse the whole ground of science, showing, step by step, the absolute impossibility of matter making the intelligence by which the action of matter in the world is regulated ; how impossible it is that vegetables can invent, if I may so say, the elaborate processes by which they grow and propagate their species, by which, when they die, they leave their successors, and by which those successors do the same ; how absolutely impossible it is, if you go into the animal kingdom, the same thing can occur, that animals, beginning with those which are so minute that we cannot discover them with our unaided powers, could have invented the conditions under which they live, and the transformations into other forms of life ; how absolutely impossible it is that all the transformations should have gone on without any guide—because the idea is that they have invented something above their own existence ; how absolutely contrary to all reason and sense this is in all branches of life, and still more how impossible it is in inanimate nature. (Applause.) If it is possible that any living thing could perform such an operation, it is absolutely impossible to suppose that an unliving could do so. We are brought to this one general conclusion, having reference to all things with and without life—namely, that the power of human observation is limited. If people go to Maskelyne & Cook's, they think that some of the things which are done there are almost miraculous, because the observation is not commensurate with what passes before the eyes. In the same way, in studying nature we are brought to the limits of our power of observation. All materialists admit that there is a point of minuteness which the human faculties of observation cannot go beyond. If, therefore, the result of all modern science and material effort is to leave you at a point beyond which material effort cannot reach, beyond which you have to deal with inferential deductions from that which you can see to that which you cannot see—if that is the result of all modern science, as it is its great glory and triumph, observe how you are brought in direct relation with that which man cannot appreciate with his own senses, but only with his intellect, and therefore into the realm which we say is the realm of the power and wisdom of God. Thus, every step is a new proof of the impossibility of any theory of what may be called material growth and development, and is, on the other hand, an absolute proof of the necessity of adopting the belief that there is a Power above which alone has prescribed the whole law for that which is living and unliving on the face of the earth—that law which mankind alone are capable of appreciating by the use of faculties which they could not have invented for themselves, but which they have received and are bound to cherish as the greatest gift of God. Such, in general terms, would be the scope of the work to be presented to the general readers of this country—a work which should present to him not merely subject for contemplation, but, at the same time, arguments that will convince him of the truth of what is challenged, and also bring him to the point of union with the ideas which

he receives from the source of revelation. It is thus the two are brought into unison and harmony, and each supports the other, and brings the mind of man to that highest point of revelation—namely, that he is the creature and servant of God, that he is capable of appreciating the will of God, and therefore of being accountable for all his actions here. This is the scope of the work which I would suggest for the consideration of our Council. I have not gone into it in any detail, on account of time, and I would say that it cannot be done in a day—nay, I do not think it could be done in a year with proper care and attention—but it may be done at no distant day, and I hope that when that time arrives the funds may have been found for its adequate dissemination. The question is one which ought not to be approached in a narrow and little spirit. If such a work is worthy of being published, it ought to be published in so many thousands, that the cost of producing it would be little beyond the cost of the paper on which it is printed. If you make a great effort, and print hundreds of thousands, the work will not only reach all parts of this country, but will be spread abroad in all places, and will sustain itself, although, in the first instance, the society ought to be able to get together the funds necessary for sending forth productions which shall be worthy of the labours which will have to be bestowed upon them. (Applause.)

Mr. S. SMITH, M.P.—I am very glad to be here to-night, to second this motion and to testify the strong feeling of interest which I have in this society. This is the first occasion upon which it has been possible for me to attend any of our meetings, but I have received our very valuable Journal for several years, and, so far as I have been able, I have read the papers therein. I think this society has been doing a very good work in this country and in this age. No one who carefully observes the progress of opinion can doubt that there has been a great growth of wild, infidel, and atheistic opinions in this country of late years. I often feel somewhat depressed and alarmed in noticing the strong tide which is running in favour of agnosticism, and the denial of all that we have hitherto considered most sacred. Perhaps these opinions have not yet entered very deeply into society, but we cannot ignore the fact that they are held by many able, intellectual men, and by some men whom we have been in the habit of looking up to as leaders in science, in letters, and in philosophy, and that they are sinking down into what are called the lower classes, with very pernicious effects. It came to my knowledge not very long since that doctrines which are destructive of the very foundations of morality and civilisation are being advocated by certain bodies. They have probably gained as yet the adhesion of comparatively but a few; but, at the same time, I am afraid that they will spread. Whenever the ground has been prepared for them by the destruction of man's sense of reverence and responsibility to God, the progress is very rapid towards anti-social doctrines. See what is going on in another country at this time. In the neighbouring country of France, and especially in the City of Paris, the foundations of morality are already to a large extent overthrown in the minds of the masses.

A friend of mine who has just returned from Paris tells me that he attended a meeting of Socialists while he was there, and the feeling which pervaded that meeting was one of bitter hatred against all classes possessing property, and that the idea of civil war was hailed with cheers. I am told also that the *employés* in Paris will not now recognise their employers, or hold any intercourse with them. They have received instructions from their societies that the employers are to be kept at arms' length, and that no intercourse is to be held with them. The doctrine widely preached is that the only way to treat the employer of labour and the capitalist is to put him out of the way as soon as possible. This is a matter which is worthy the attention of all thoughtful men, and I think that those who are dallying with these doctrines are little aware of the state of things they are helping forward, and of what would be the consequences if such doctrines were commonly held by the people. This Society is one of the various means of combating such views. Of course, I do not lose sight of the work accomplished by the Christian Church, which is the great means of preserving in this world all the elements of peace, prosperity, and true social welfare ; but it has various auxiliaries, and I think this Society and other associations, are very valuable aids to the more direct religious work of the Christian Church. I think also we require to recognise more clearly the terrible condition in which a large portion of the population exists. I am convinced that the extreme degradation in which certain portions of our large populations live is a seed-bed in which these dreadful infidel anarchical doctrines will take root and bear the most bitter fruit, and it becomes those who value the future of the country to consider what they can do to improve the condition of these degraded masses. Are we sufficiently alive to the fearful elements of danger that lie near our doors ? These people have kept very quiet, all things considered. They have not yet been much influenced by infidel lecturers and agitators ; but they will be drawn more and more in this direction. Education is spreading. The children of these degraded masses are being taught to read. The first literature that will come into their hands is this infidel literature of which Mr. Ayrton has been speaking, filled, as it is, with the most dangerous doctrines ; and when a few years have elapsed, we may expect a crop of Atheism and Communism, with all its attendant evils, in this country, such as is now being produced in Paris. We see it in America, and I am sorry to say that the same thing is spreading amongst the educated classes in India. I have lately received a letter from a friend in India, informing me that the educated natives are to a great extent adherents of the doctrines of Mr. Bradlaugh. All these things fill one with considerable dread of the future. I apprehend that the great battle of the future will be with unbelief in all its most daring forms, and it behoves all who love their country to do all they can to counteract these dangerous agencies. This society is one of the means well adapted for that purpose. I wish it all prosperity, and hope its publications will prove a great success. (Applause.)

The motion was carried unanimously.

Mr. JAMES BATEMAN, F.R.S.—In acknowledging this kind vote of thanks, my words will be very few; and they will not be few, I am sorry to say, from any embarrassment such as a person might feel from having himself wrought any part of the meritorious work which has called forth such a handsome acknowledgment in such an important meeting. Full justice, and, I think, no more than justice, has been done to the Council; honour to whom honour is due; and we must not forget the thirteen years' labours of my gallant friend the Hon. Secretary, who is entitled to a very large share of this well-merited meed of praise. He must himself be astonished at the success of his labours. To those labours, to his indomitable perseverance, and to his unflinching faith in his mission, this Society owes what it has attained. I remember the time when our adherents were reckoned by units, while now they are to be counted by hundreds, for at this moment the Society has a roll which extends to four figures. (Applause.) It would have been still larger than it is but for a very heavy death-rate, which includes some of our most important members, and men who were universally known, such as the Earl of Harrowby and Lord O'Neill. How much the Society has lost by the death of Lord O'Neill you will be better able to appreciate when you have heard the paper which the Bishop of Derry is about to read. I hope I shall not be accused of any breach of confidence if I read a passage from a letter which I received yesterday from Lord O'Neill's widow. She tells me that not only she, but her daughter and all the family have their thoughts fixed on this meeting to-night. Her words are these: "I do hope that you and all who value the dear and holy words will be able to be present, and in doing so you will bring solace to a heart as completely broken as there ever was on earth." This adds a new interest to our meeting to-night, and I am sure it will be a great privilege to me to be able, when the meeting is over, to communicate to Lady O'Neill, not only how largely it was attended, but also how fully the value of Lord O'Neill's paper was appreciated by those who were privileged to be present.

[THE following Address (entitled "An Unbeliever's Description. of Christianity") written shortly before his decease, by the late RT. HON. LORD O'NEILL, was then read by the RIGHT REVEREND the LORD BISHOP OF DERRY.]

I AM not aware that I have met with any more succinct enumeration of the objections raised against Christianity, or one more plausibly expressed, than that which occurs in Mr. Herbert Spencer's "First Principles," p. 120. Speaking of the spirit of toleration which "the catholic thinker" should display, he there says:—

"Doubtless, whoever feels the greatness of the error to which his fellows cling, and the greatness of the truth which they reject, will find it hard to show a due patience. It is

hard for him to listen calmly to the futile arguments used in support of irrational doctrines, and to the misrepresentation of antagonist doctrines. It is hard for him to bear the manifestation of that pride of ignorance which so far exceeds the pride of science. Naturally enough, such a one will be indignant when charged with irreligion, because he declines to accept the carpenter-theory of creation as the most worthy one. He may think it needless, as it is difficult, to conceal his repugnance to a creed which tacitly ascribes to the Unknowable a love of adulation such as would be despised in a human being. Convinced as he is that all punishment, as we see it wrought out in the order of nature, is but a disguised beneficence, there will perhaps escape from him an angry condemnation of the belief that punishment is a divine vengeance, and that divine vengeance is eternal. He may be tempted to show his contempt when he is told that actions instigated by an unselfish sympathy, or by a pure love of rectitude, are intrinsically sinful; and that conduct is truly good only when it is due to a faith whose openly-professed motive is other-worldliness. But he must restrain such feelings," &c.

And the Christian must also restrain his feelings of "indignation," "repugnance," "angry condemnation," and "contempt," when he meets with such a burlesque of Christianity as that set forth in the paragraph just quoted. Not being able to read the hearts of his fellow men, he must endeavour to give them credit for good intentions, even when they are misrepresenting and vilifying the religion which he believes in his heart to be true, and on which he leans for deliverance from the wrath to come. He must not allow himself to be surpassed by the unbeliever in patience and forbearance, when he sees the creed which he is accustomed to hold in veneration painted in false colours, and finds doctrines which, so far as they are believed and acted on, are calculated to regenerate the world, represented as irrational, degrading, and injurious to morality. This charitable spirit I shall endeavour, with God's help, to maintain in dealing with Mr. Spencer and others who assail the doctrines of Christianity. I desire to believe that their study of the orderly and regular processes of what we call nature, has caused them unconsciously to see subjects of a different kind through a distorting medium, and that they are not instigated by any wrong motives or intentions.

In all caricatures, a certain likeness to the original is preserved. It is this, indeed, that gives them their piquancy. And it is not difficult to see, in the above passage of Mr. Spencer's, a likeness to the creed which is burlesqued in it, sufficient to leave us without any doubt that Christianity

is the religion held up to scorn through it. It divides itself into five heads:—

1. The carpenter-theory of creation.
2. Love of adulation on the part of the Deity.
3. Eternal vengeance.
4. Good actions intrinsically sinful.
5. Other-worldliness the motive of faith.

First, then, as to the carpenter-theory of creation.

If by this expression be meant simply a belief that God created the universe and all that it contains, what can be the object of calling it the carpenter-theory? The only conceivable object, in that case, is to make it *sound* absurd, by giving it an anthropomorphic twang which does not in reality belong to it. It is like the Puritans creating a prejudice against church organs, by calling them “whistle-pipes,” or “skirl-pipes.” I am not aware of having ever seen the belief in creation called a carpenter-theory by any Theist, whether the form of his religion be Christianity or any other. It is, in fact, a *nickname*, most unjustly conferred upon that belief by those who reject it. It is true, we occasionally find the Creator of the universe spoken of as “the great Artificer.” But it is evident to all who choose to see, that this word is only meant to be a synonym to the word “Creator,” expressing (as synonyms generally do) but a part of the whole idea, and used with a view to avoid wearying the ear with the same word often repeated, as well as to impart a pleasing variety to the language. “Artificer” means, in its strictest sense, “maker,” a word which is also often applied to the Creator, as witness its use in our creeds. And both these words (artificer and maker), when used in speaking of men, can only include in their signification the idea of forming things out of materials already existing. Transferred metaphorically to the Deity, they connote to believers the additional idea of creating those materials. Believers, therefore, in using such words, are very far from implying that God only works as a carpenter does, from materials ready to his hand. But it suits the object of unbelievers to ridicule them as holding this view, and as associating the Deity in their imagination with a wooden bench, in the midst of planes, saws, chisels, sawdust, shavings, &c.

If they should reply that by the carpenter-theory of creation they mean the belief in creation out of nothing, then the word is a complete misnomer. Believers in creation no more believe in the carpenter-theory of creation than does Mr. Spencer himself. They believe that God called the world into existence out of nothing, the very thing which a carpenter cannot do. Mr. Spencer may, therefore, spare his indignation at “being charged with irreligion because he declines to

accept the carpenter-theory of creation as the most worthy one." Those against whom he feels so indignant might, perhaps, charge him with irreligion if he *accepted* that theory. But certainly it is not for rejecting it that they do so. It is for rejecting creation itself. It is for rejecting the doctrine that there is a conscious, intelligent Creator of the universe, or any God, unless that name may be given to the Persistence of Force which he seems to identify with the Unknowable ("First Principles," chap. vi.)

But why should Mr. Spencer feel so indignant at being charged with irreligion? Does he wish to be considered religious? As a worshipper of the persistence of force, perhaps he does. But he cannot expect that Christians will accept that for religion. Or perhaps he only objects to the *ground* on which the charge is brought. If so, however, I think it has been sufficiently made to appear that he has entirely mistaken that ground. The ground is that he rejects God as a Creator, not as a carpenter.

Dr. Tyndall, in his well-known Belfast address, supplies us with a similar, yet somewhat different, view of this "carpenter-theory." Speaking (in p. 36) of the different forms of life, rising gradually from the simplest to the most complex, he says: "In the presence of such facts it was not possible to avoid the question—Have these forms, showing, though in broken stages and with many irregularities, this unmistakable general advance, been subjected to no continuous law of growth or variation? Had our education been purely scientific, or had it been sufficiently detached from influences which, however ennobling in another domain, have always proved hindrances and delusions when introduced as factors into the domain of physics, the scientific mind never could have swerved from the search for a law of growth, or allowed itself to accept the anthropomorphism which regarded each successive stratum as a kind of mechanic's bench for the manufacture of new species out of all relation to the old."

By those influences which have always proved hindrances and delusions when introduced into the domain of physics, Dr. Tyndall evidently means the Mosaic account of the Creation, which, according at least to the ordinary interpretation, assigns a distinct act of creation to each of the successive forms of life. And this he calls *anthropomorphism*, which is as unfair and false a term to apply to it as is the term "carpenter-theory." For what is anthropomorphism? It is taking our idea of the Deity from what we see in man. It is, to use another expression of Dr. Tyndall's, looking upon God as "a manlike artificer." But what is there that is manlike in

creating the universe out of nothing? It is just, of all others, the thing which no man ever did or could do. We may justly enough ascribe anthropomorphism to the ancient heathens, who described their gods and goddesses as swayed by human passions, prejudices, and interests, and having material bodies—a little more ethereal, perhaps, and more easily transformed than those of men, but sustained by food and drink (which, to distinguish them from those used for human wants, were called “ambrosia” and “nectar”), and capable of being hurt, though not completely destroyed, seeing that they were immortal. Thus, Homer represents Venus as wounded in battle by Diomedes, which caused a refined kind of blood, called ichor, to flow from her hand (“*Iliad*,” v. 340). Virgil* represents his gods and goddesses as changing their form when occasion required, which is, no doubt, attributing to them a power more than human; but even so, we may accept Hume’s description of them, as quoted by Dr. Tyndall in the first page of his Belfast address—namely, that they “were nothing but a species of human creatures, perhaps raised from among mankind, and retaining all human passions and appetites.” That the invention of gods and goddesses such as these may be ascribed to anthropomorphism, we can readily admit. But the God in whom Christians believe is as different from these as light is from darkness. These have bodies and passions like ourselves, whereas our God is a pure Spirit, “without body, parts, or passions” (Art. I.). I am not aware that any of the heathen gods were supposed to have created the universe out of nothing. Jupiter is indeed called “*pater omnipotens*” by Virgil in many places, but I find no trace of the idea that his power extended beyond a certain control over the atmosphere, whereby he was supposed to wield the powers of thunder and lightning, or such a control over matter as we ourselves have (only in a much greater degree), whereby the mountain Olympus, which was supposed to be his throne, could be shaken by his nod (“*Æneid*,” ix. 106). But however this be, the power to create is a power utterly impossible to man, and to accuse us of anthropomorphism for attributing this power to God, however little intended by Mr. Spencer and Dr. Tyndall, is to utter a most unfounded calumny against those who believe in the Creator of heaven and earth.

The belief in successive creations is made to sound more improbable still by Dr. Tyndall, through the use of an

* “*Æneid*,” i. 315, and vii. 419.

expression whose unfairness is indubitable. In p. 58 of the Belfast address he describes that belief as "a theory which converts the Power whose garment is seen in the visible universe into an artificer, fashioned after the human model (the usual cavil again) and *acting by broken efforts*,* as man is seen to act." The effect of the word "efforts" on the mind of an unthinking person would be that he should imagine the efforts of the Creator, or at least some of them, to have been unsuccessful. Else why call them efforts? Why not say they are *acts*, which word means *successful* efforts, and would truly describe the work ascribed to the Deity by believers? But he also calls them *broken* efforts, thereby intensifying the idea of want of success, because the expression seems to imply that they had to be broken off, some of them at least, in an unfinished state. If this were not the object, "successive," or some such word, would be the correct one to use. It might be asked, How would Dr. Tyndall like to hear the words "broken efforts" applied to a series of successful physical experiments conducted by himself?

It is really surprising that men of philosophical mind and habits of thought should condescend to such quibbling. If it were to promote any other object than the depreciation of religion, I cannot think they would. But for such an object as that, it seems all stratagems are allowable.

Mr. Spencer, in an earlier part of his book than that to which I have been lately referring ("First Principles," pp. 33-4), carefully calls attention to the inadequacy of the "carpenter-theory" to serve as a simile for creation. But he does so under the delusion that Theists have adopted that theory, the fact being that it is falsely attributed to them by the men of his school. Theists, especially those of them who are Christians, have no theory whatever on the subject of creation. By a theory is generally meant a hypothesis explanatory of some fact. The fact of creation they acknowledge, but they confess their inability to account for it by any theory. Whatever else, therefore, may be said against us, let us no more be charged with accepting, or requiring others to accept, the carpenter-theory of creation.

The next objection we have to consider is that in which we are accused of ascribing a love of adulation to the Deity.

If we take the word "adulation" in its usual sense, it is enough simply to deny the charge. That God is pleased with His creatures for their own sake, when they appreciate His character, however inadequately, and when they have a

* The italics are mine.

grateful sense of His goodness towards them, is a truth which believers are not ashamed to confess. And for the outward expression of such feelings on the part of men, they use the word "praise," but not "adulation." The word "praise," however, would not have answered Mr. Spencer's object, and therefore he prefers to call it "adulation." Now, adulation means flattery, which is a very different thing from praise. If I might venture to explain the difference, the word "adulation" includes in the idea expressed by it, the notions of servility and insincerity on the part of the flatterer, together with the supposition that the flattered person is so vain as to swallow all that is said to him, and so weak as to be induced to confer favours without reference to the question whether the object of them be deserving or not. Praise includes none of these elements. It is the outcome of admiration of the divine attributes, among which are right and justice, and freedom from all those weaknesses to which human beings are liable. This word therefore would not have served Mr. Spencer's turn. "Adulation" suits him much better; only it has this disadvantage, that it is utterly inapplicable to the Deity in whom Christians believe. I hope, therefore, we may no more hear believers charged with worshipping a God who loves adulation.

The next charge brought against the God whom Christians acknowledge is, that they consider punishment to be a divine vengeance, and that divine vengeance is eternal. Now it may be fully admitted that the Scriptures often use such words as "vengeance," "anger," "wrath," &c., when speaking of punishment inflicted by God. But inasmuch as the God in whom Christians believe is described by them as a Spirit, "without parts or passions," as already observed, it is evident that they do not understand the words in question in the sense in which they are used when applied to human beings. They are used to signify that God does what *in a man* would be looked upon as the result of one of those passions, but it is not meant that the Deity acts upon any such impulse, or from any other motive than to do what is right. When the Scriptures say that the eyes of the Lord are over the righteous, and His ears open to their prayers, no one imagines them to mean that the Deity has the bodily parts there mentioned, inasmuch as they always represent Him as pure Spirit. Similarly when they say His hand is stretched out, or His arm uplifted, no one is so absurd as to think they attribute to Him literally the possession of arms or hands. Why, then, should they not be understood in a somewhat similar manner when they speak of divine vengeance? The

character of God is so little comprehensible to us, that we can only take in descriptions of it which are couched in human language. We are quite unable to represent to ourselves the state of mind (to use a very inadequate expression) which corresponds in Him to the feeling which we call vengeance. Beyond the fact that it terminates in acts something similar to those which are the outward manifestation of vengeance in us, we know nothing about it. We can only believe that God punishes the wicked, because He sees it to be fitting and right that He should do so. There are, no doubt, some who question the fitness or righteousness of the acts of the Deity in this matter. But I believe that such persons speak of a matter of which they are no judges. If we were our own judges, no doubt we should punish ourselves lightly, if at all. And it appears to me that we are only able to look upon the matter from our own standpoint. I mean that we can only know what judgment we should pronounce upon our own demerits, but have no means of judging how they ought to appear in the sight of God, or with what degree of punishment it is right that they should be visited. Those of whom I have now been speaking admit God's justice in inflicting a certain amount of punishment. They believe that His inflictions are not vengeance, such as men would exercise, and here their view of Christianity differs from that depicted by Mr. Spencer. Whether the punishment be greater or smaller, shorter or longer, he attributes it (in his representation of that view) to a motive of revenge—for although he calls it vengeance, which is a word of somewhat wider signification, the implied motive is revenge, otherwise the objection would amount to nothing. Vengeance may, I think, be explained to be the infliction of punishment from a motive of revenge. And this, all believers refuse to accept as the explanation of Divine punishment. Surely if Mr. Spencer had considered the great love for the world which Christians ascribe to God, and which induced Him to give His only Son to save its inhabitants from the punishment which justice would otherwise oblige Him to inflict—he might have been saved from giving so false and injurious a representation of the divine motives, as forming a part of the Christian system.

What I have said about applying to God words ordinarily used to express human feelings, may be taken as explanatory of the Christian view (mentioned under the last division of our subject), that God is pleased when His creatures express their appreciation of His perfections in terms of praise. As we can form no adequate conception of the feeling in Him to which we give the name of vengeance, so neither can we form an

adequate conception of the feeling in Him which we call pleasure. All we can say is, that everything shows us that God is good, and wills that His creatures should be good also in their degree. Goodness in man is accompanied by the appreciation of goodness in other beings, and therefore chiefly in the Divine Being, in whom it is found in all perfection. Therefore, they who appreciate the divine character as they ought are good—are, to a certain extent, such as God would have them be, and so we say that God is pleased with them, and with the praises they offer Him.

The next objection, as stated by Mr. Spencer, is, "that actions instigated by an unselfish sympathy, or by a pure love of rectitude, are intrinsically sinful."

It seems probable that the allusion here is to the thirteenth of the "Articles of Religion," in which it is declared that "works done before justification," or, as further explained, "before the grace of Christ and the inspiration of His Spirit, are not pleasant to God, forasmuch as they spring not of faith in Jesus Christ," and that not being done as God hath willed and commanded them to be done, "we doubt not but they have the nature of sin;" or it may be that Mr. Spencer had in his mind some passages of Scripture to the same effect, as "without faith it is impossible to please Him" (Heb. xi. 6), and "they that are in the flesh cannot please God" (Rom. viii. 8). Now, it cannot be necessary to observe here, except for the information of some outsiders who may read the Transactions of this Society, that the Christian doctrine is this—that owing to the fallen nature which we all inherit from the first human pair, no works that we can do, even when assisted by grace, are free from much that is imperfect and sinful; and that still more is this the case when we are not so assisted. Thus, so far from saying that an act springing from a purely good and unselfish motive is intrinsically sinful, the Christian teaching is that such an act is never done; that, however excellent a deed may appear in the eye of man, in the sight of God it is so mixed up with sinful thoughts and motives that it can only be made acceptable to Him when it is done in faith, and that, for the sake of the atonement made by His Son, whereby what is wrong in it is, as it were, washed out and not had in remembrance before Him. In the Christian system, faith is set forth as the root of all that is good in our character, and as that which makes us to be accounted righteous in God's sight. Thus, works that are done in faith are looked upon, notwithstanding all their imperfections, as good. The goodness in which they are deficient is *imputed* to them. But without faith they are not pleasing to God; and, as this

is owing to their being so mixed up with worldly, selfish, or sinful motives and feelings, works not done in faith are said in the Articles to "have the nature of sin."

Now, Mr. Spencer's way of representing this teaching would make Christianity answerable for the absurd assertion that works intrinsically good are to be looked upon as intrinsically sinful; whereas its true teaching is that *no* human works are intrinsically good, but that such of them as are done in faith have a goodness imputed to them which does not actually belong to them, and so are rendered acceptable to God for the merits of His Son.

We may observe the contrast between the mode of expression adopted in the Article and that made use of by Mr. Spencer. The Article adopts as mild a form of words as could well be thought of. It does not say that the works of which it speaks (works done previous to justification) are actually sinful, much less intrinsically so, but merely that "they have the nature of sin" (Latin, "*peccati rationem habere*"). Mr. Spencer, on the contrary, intensifies the assertion by the addition of the adverb "intrinsically," leaving no stone unturned whereby religion might be made to appear absurd in the eyes of his readers.

The fifth and last of the misrepresentations (I do not say *intentional* ones) comprised in the comprehensive paragraph quoted near the commencement of this paper is, "that conduct is truly good only when it is due to a faith whose openly-professed motive is other-worldliness."

The gist and force of this lies in the rather unusual word, "other-worldliness." As *worldliness*—*i.e.*, a regard to our well-being in this world—is generally looked upon as a low motive to action, the imputation of *other-worldliness* has the appearance of implying that a regard to our well-being in the world to come is a low motive also. Now, no Christian looks upon a regard to our welfare, whether in this world or the next, as the highest motive; but neither is it to be looked upon as a *wrong* one. To excite a prejudice against Christianity, some unbelievers have called it *selfishness*, and pronounced it *immoral*, while they at the same time erroneously represent it as the *only* motive held out by the Christian system to those who believe in it. Thus they would have the world to suppose that the whole of Christianity rests on an immoral foundation. It might seem that a charge so absurd as this might well be left to refute itself. But it is so often urged in the present day, and that by writers whose eminence in other departments than that of religion imparts to them a factitious influence over the minds of the unthinking, that it

is incumbent on the Christian advocate to endeavour to take it to pieces and point out its baselessness and unfairness.

I shall begin, then, by calling attention to the distinction between *selfishness* and *self-love*. They are sometimes in used the same sense, but there is a proper and praiseworthy self-love, to which no blame whatever is to be attached. I should prefer to avoid the use of the word, as being liable to be misunderstood, were it not that it has been adopted by Bishop Butler as a convenient expression for that regard to our own interests and happiness which it is not only our privilege, but our duty, to act upon. He calls it *reasonable* or *cool* self-love, as leading us to consider and reflect upon the best means of ensuring our happiness in the long run. But while he looks upon this reasonable regard to our well-being as a right and proper motive, he is very far from representing it either as the highest, or the only one that ought to influence us. *Benevolence*, or a regard for the good of others, should come in at least in an equal degree ("Thou shalt love thy neighbour as thyself"), but both of these principles are subordinate to the moral sense, or conscience, by means of which we judge whether an action is right or wrong, virtuous or vicious, abstracted from its consequences to ourselves or others. This is the moral test to which our actions should be submitted, the principle which, as it were, reigns supreme over all the other principles of our nature. If an action be prompted by benevolence or by that reasonable self-love which I have endeavoured to describe, yet if we see it to be *wrong*, we ought at once to refrain from doing it.

That the Christian religion recognises and proceeds upon the view of morality here set forth, cannot, I think, be reasonably disputed. No doubt it holds out other motives in addition to those above mentioned, but its morality is founded upon eternal principles of rectitude. The Deity Himself acts upon such principles, as already observed, and the precepts given in Scripture show that He would have men to act upon them too.

Bishop Butler designates a reasonable self-love by the name of *prudence*, observing that although subordinate to moral considerations, it is very superior to acting merely on such desires as happen for the moment to be uppermost. It is not properly called *worldliness*; for prudence is a good and useful trait in the human character, whereas worldliness is not looked upon as such. Worldliness as a term of reproach appears to have little meaning, except when used by believers in a future state of retribution. Christianity recognises prudence, or a reasonable regard to one's own interests, as a

duty, when it does not lead to any violation of the principles of rectitude; only it ought not to be confined to the present life, but should provide also for happiness in a life to come. When it is confined to the present life, it is called worldliness, which has thence become a term of reproach, as implying the neglect of a man's highest interests, while unduly caring for his worldly welfare. But when used by an unbeliever in a world to come, there can be no reproach implied in it, because then it simply means a prudent regard to prosperity and comfort in the only world whose existence he acknowledges. If this be a correct description of worldliness, as I venture to think it is, there is really no intelligible meaning in the term "other-worldliness," as implying that a regard to happiness in a future state is a wrong motive. The very persons who use it would be among the last to find fault with a due regard to worldly welfare, and are therefore inconsistent when they insinuate that there is anything faulty in the endeavour to secure lasting happiness in another world. A desire for happiness, in short, is one of the strongest principles implanted in our nature, and nothing can be more absurd than to expect that a religion which has any pretension to exert an influence in the world, should ignore it, or fail to contain a provision for working upon it; subordinate, of course, to the higher motive of acting according to right. This higher motive is that which the enemies of Christianity endeavour to keep out of view.

That selfishness is not to be confounded with a reasonable self-love is obvious. A selfish person is one who thinks *only* of himself, and has no regard to the feelings, wishes, or comforts of others. But a reasonable self-love is quite compatible with a regard to the happiness of others. There may, no doubt, be particular cases in which we are compelled to choose between the good of ourselves and that of our neighbours, but these are comparatively rare: and it is evident that the two *principles* of a desire for our own and for our neighbour's advantage are quite compatible, and in general conducive the one to the other, when all the circumstances are taken into account.

I have said that besides the duty of regulating our actions by the rule of rectitude, Christianity supplies us with motives which, if duly encouraged and cultivated, are of great assistance towards enabling us to act up to what is right. The chief and highest of these additional motives is love to God, with the desire to please Him which such love is calculated to engender. This, as well as that principle of rectitude which lies at the root of all morality, is entirely left out by Mr.

Spencer in the summary of Christianity (as he represents it) which forms, as it were, the text of this paper, so as to make it appear that the only motive to do what is right is a love of self, and this love of self he characterizes by a term of reproach entirely inapplicable and undeserved, namely, other-worldliness.

Upwards of three years ago a controversy appeared in the *Nineteenth Century*, on a subject very much akin to that which is now before us, namely, the question whether atheism destroys the foundations of morality. The advocate of atheism was Miss Bevington, who maintained that morality, so far from suffering any loss, would be rather a gainer by the rejection of a belief in God. Her opponent was Mr. Mallock, the author of "*Is Life Worth Living?*" and of other works, who maintained, on the other hand, that the rejection of a belief in God necessarily involved the abolition of moral distinctions. To me it appears that both of these gifted writers were mistaken, believing, as I do, in opposition to Miss Bevington, that morality would lose very substantially if a belief in God should perish from the world, and, in opposition to Mr. Mallock, that morality has its root in the nature of things, and need not absolutely perish if a belief in God were rejected. There is, indeed, reason to fear that, practically, great moral laxity would follow the extinction of theism; but I believe that there would still remain the distinction between virtue and vice, although the obligation to follow the one and avoid the other would have a much looser hold on the generality of human beings. When I speak of belief in God, I of course mean the acknowledgment that there is not only a god of *some kind or other* (such, perhaps, as the Persistence of Force), but a Deity conscious, intelligent, powerful, and who has a regard to the conduct of His creatures. Nothing short of this would be a belief that could influence human conduct.

To consider, one by one, the arguments used by Mr. Mallock and Miss Bevington respectively, would both occupy too much time, and would be beyond the scope of this paper. But I may perhaps be permitted to bring forward one or two considerations of a general nature in connexion with the subject.

It seems evident at once that a belief in the God whom Christians acknowledge not only supplies additional *motives* for morality, but also *enlarges its domain*. The motives to which I refer are the love and fear of God, and the enlargement of the domain of morality consists in the addition of a distinct class of duties, comprised under the head of Duty to God.

Neither these duties nor those motives could possibly have place in the morality of an unbeliever. In these respects, therefore, morality must be a loser by the extinction of belief in God, unless indeed it could be shown that duty to God forms no part of it, and that love to God and unwillingness to incur His displeasure have no influence on those who believe in Him. To prove that duty to God forms no part of morality, would require that it should be first proved that there is no God in the believer's sense of the word; and this, I venture to say, never has been, or can be, done. That the love and fear of God have little or no influence on those who acknowledge Him, Miss Bevington attempts to show, but in my mind she entirely fails to do so. She brings forward a number of motives by which the generality of mankind are influenced as much, or more, than they are by religion; and asserts that "a man who is capable of making difficult exertion, restraining a furious passion, or patiently enduring a painful experience, for the sake of a loved and ideal God, or a vague and distant heavenly reward, is equally capable of doing so for the sake of a fellow creature, or for the reward he receives through the exertion of his sympathetic affections." This is quite true, but no argument. The man who can endure pain and restrain a furious passion for the sake of a loved God and a heavenly reward (I omit Miss B.'s disparaging epithets, as not being to the purpose, and put *and* instead of *or* before "a heavenly reward," because Christianity holds out *both* motives) is, according to Christian belief, under the influence of Divine grace, which will certainly prove no hindrance to the exercise of sympathy and benevolence towards his fellow creatures, but rather increase it. Thus religion aids morality by supplying additional motives and good dispositions. I do not say it *creates* morality. I have already stated my belief that morality would exist if there were no religion, though it would stand a much worse chance of being practised. But the question is not between religious motives alone and ordinary motives alone. It is between ordinary motives alone and ordinary motives *plus* religious motives. It is, therefore, only a source of confusion and fallacy to discuss the question whether religious or ordinary motives are the more efficacious. With the generality of mankind, it is too true that the visible affects them more than the invisible—the things seen, which are temporal, more than the things unseen, which are eternal. But our position is, that whether this be so or no, religion is calculated to come to the aid of morality by supplying motives and principles which morality alone does not supply. If morality rests on motives connected with what is visible, religion does not discard these,

but supplies motives derived from the invisible also, and there can be no doubt that these two together are calculated to be of more force than one of them alone.

But Miss Bevington, in dwelling upon the little power which religion has to improve the generality of those who acknowledge the Deity, seems entirely to ignore that class of believers who are what we call *true Christians*. That there are too many who, while intellectually acknowledging God, yet act as though they disbelieved His existence, and seldom or never give Him a thought, is a melancholy fact, and one which the Scriptures fully recognise. But there is also a large class of them—though, it is to be feared, not *so* large—who “set God always before them,” remembering that He is ever present, and that He watches over all that they do or think; loving to do His pleasure, and careful to avoid whatever may be displeasing to Him; recognising His authority, and looking to the reward held out to those who endeavour to follow Christ’s example. These are not free from imperfections; temptations may at times get the better of them, and the hopes and allurements of this life may occasionally obscure their visions of the world to come. But their course, notwithstanding occasional, or even frequent, deviations, is heavenly, and many of them have shown that they are ready to endure pain and imprisonment, yea, to suffer death itself, for the sake of Christ, who suffered and died for them. These would be among the last to say they are perfect, but they trust that their imperfections and sins will be washed away in the blood of the atonement. This is a class of persons which seems to be entirely left out of sight by those who say that religion is no help to morality. As long as there are true Christians in the world, so long will it be evident that such a position is false. Let unbelievers say what they will, such as these are “the salt of the earth,” and if they were not living examples of what religion can do in promoting love to our neighbours, which lies at the root of practical morality, it seems quite possible that belief in religion might become a thing of the past.

I would just notice one other statement of Miss Bevington’s, in the articles contributed by her to the *Nineteenth Century*. It is this; that the requisites to an action being virtuous are:—1. That it should be useful; and 2. That it should be difficult. I think it is easy to show that these two characteristics do not constitute the ground of virtue. We may presume that Miss Bevington means to say that the action, in order to be virtuous, should be done with the *intention* that it should be useful; and I think it may also be presumed that by “useful,” she does not mean useful to some, while it causes

greater injury, perhaps, to others, but that on a balance being struck, the good which the action is calculated to produce should exceed the injury; and, therefore, that on the whole it may be looked upon as useful. This interpretation of her meaning appears to be warranted by other passages in her essay, in which she alludes to motives and to the general good, though her not having included the motive in this, the only one (if I don't mistake) in which a formal statement of that in which virtue consists is attempted, cannot but be considered a great omission. The great consideration is the motive. If an action ever so difficult, and ever so useful to the majority of human beings, be done from malice, for the purpose of injuring even one person, that action, so far from being a virtuous one, will be highly wicked. This I am sure Miss Bevington would admit. What we have to consider, therefore, is whether the fact of an action being difficult, and done *for the purpose* of causing more good than harm, necessarily makes it a virtuous one.

In the first place, it does not clearly appear that difficulty is an essential ingredient in a virtuous action at all. Difficulty requires self-denial, and self-denial is virtuous only when it is undergone for the sake of doing a virtuous action. It may be undergone, however, for the sake of doing a very vicious action, and then it is far from being virtuous. Self-denial, therefore, is not in itself a virtue, nor could it make an action virtuous that was not so independently of it. If I pay a just debt, I am doing a right thing, whether I had the money ready wherewith to discharge it, or whether I have been compelled to work hard in order to obtain it. I admit that the endurance of pain and labour may be a certain test of the *strength* of the virtuous principle in my character. It is possible that a man who pays his debt without any trouble might be disposed to repudiate it if he had a difficulty in procuring the means. But the payment is not the less an honest act on that account. That which tests the strength of a principle is no more the essence of that principle than a spirit-gauge is the essence of the spirit of whose strength it is an index. We must here distinguish between a particular act of honesty and the principle of honesty in the human character. An act done with a view to give a man what belongs to him is an honest act, independent of the question whether the doer of it would have the principle of honesty sufficiently strong to enable him to do it if the difficulty were greater. Thus it cannot be said that one honest act is more honest than another, while yet it may be said that one *man* is more honest than another, because in the one case we are speaking of what a

man does, and in the other of the man himself. Again, if difficulty were essential to a virtuous act, the vicious character of an act would also depend on whether it is easy or difficult. And I don't think any one would maintain that the guilt attached to the perpetration of a murder would not be guilt if the question whether it was easy or difficult were decided either way. If it be done under difficulties, it only shows the determination of the murderer to be the stronger, and if it be done with ease, it is equally a wicked deed. It seems to me, therefore, that we have now disposed of the question whether difficulty is essential to the moral character of an action, and have fairly decided it in the negative.

There remains still the question whether utility makes an action to be virtuous. Here, again, we must take in the consideration of motive, as the most useful action that ever was done must be morally bad if the motive that induced it be bad. The question, then, should be put in this form. Does the intention of doing good, or—if its results be of a mixed character—of doing more good than harm, make an action to be morally good?

As this question has long exercised the deliberations of moralists, of whom there are two schools, chiefly represented by Bishop Butler on the one hand and Archdeacon Paley on the other, it seems to me that it would be a superfluous task to discuss it here. My only reason for not entirely leaving the matter in the hands of those two eminent writers is, that Butler, in opposing the doctrine that utility is the foundation of morality, assumed a Creator, and thence inferred the reality of moral distinctions, on the principle that God has so constituted us as to have a perception of those distinctions, which we cannot suppose He would have done if they did not exist. As this argument could not have weight with those who deny a Creator, and as our present business is with these, a few words seem necessary to make our subject complete.

It cannot, I think, be denied that there are certain things which all human beings have a *right* to. Every one, for example, has a right to his life, as is acknowledged in the laws of civilised countries, which make homicide in self-defence to be justifiable. Every one also has a right to his limbs, as is acknowledged in the laws against mutilation; and every one has a right to his personal liberty. These rights may be called natural, as without the recognition of them all social relations must be destroyed, and man is by nature sociable. It is true that rights may, under certain circumstances, be forfeited, as when a murderer justly suffers the punishment of death, with the loss of his liberty for the time

he is allowed to live. But such cases are exceptional, and (as is often the case) they prove the rule, because society must punish outrages which tend to its own destruction, and it is on the existence of society that the rights just mentioned are founded. I am not forgetting, here, that Christians have a still better foundation than society for the acknowledgment of these rights, but it must be kept in mind that from the nature of the case I am compelled to take ground which unbelievers must, or ought to, acknowledge; and as these only acknowledge what is natural, and man is naturally sociable, they must hold that rights founded on society are natural.

Now, the very idea of a man's having a right to anything, involves moral distinctions. For, if A has a right, B does wrong if he endeavours to deprive him of it. To do so would be to do him an *injury*—an injustice.* It is something more than merely inflicting pain upon him, which is cruelty. The idea of its being an offence against right is also included. On this account I look upon moral distinctions as having a foundation in nature—in human nature at any rate. And it is because we have no right to injure our neighbour that the precepts of the Decalogue—those of them, at least, which inculcate our duty to our neighbour—were given. The object of those precepts was to enforce morality, not to supersede it; and therefore it is that I look upon Mr. Mallock as going much too far in his laudable zeal for religion when he says that without it there would cease to be any distinction between virtue and vice, as such. I so far concur with him, however, as to believe that men would have much less regard to moral distinctions even than they have now, little as, alas! they now regard them; and, therefore, that with the extinction of religion, morality would receive a most severe blow, and perhaps be in danger of perishing altogether.

I have mentioned natural rights, such as the right to the possession of life and limb. There are, however, other rights, founded on the rules and customs of society, which may be different in different countries, and which may be looked upon as natural in a secondary sense, because society itself has its foundation in nature—in human nature especially, but we see the germs of it in the lower animals also. In civilised society these rules and customs include the laws of the country, and as life and limb are possessions to which nature itself gives every one a right, there are other possessions, external to the individual, the right to which is given by the law of the land.

* From Latin *in*, signifying *not*, and *ius*, right.

Hence the idea of *ownership*. Hence also the general consent of mankind that it is a wicked thing to deprive any one, either by force or subtlety, of what is his own.

Many are the speculations suggested by these considerations, but I must forbear to enter upon them. My chief aim has been to make it appear that the Christian religion rests upon a moral foundation; that, while appealing to our desire for happiness—that desire which is ingrained in the constitution of man—it holds out no selfish motives, such as its enemies are so anxious to accuse it of, but proposes to us the noblest aims, and calls forth the highest principles of our nature; and that the God whom Christians acknowledge and adore is falsely accused when He is represented as “a man-like artificer,” as delighting in adulation, or as indulging feelings of revenge. If I have in any degree, however small, contributed to bring out and disseminate these results, my object has been gained.

Mr. ALEXANDER MCARTHUR, M.P., moved: “That our best thanks be presented to the Lord Bishop of Derry for reading the late Lord O’Neill’s Address, and to those who have contributed papers during the session.” We deeply regret the loss of our excellent friend Lord O’Neill, and we must all be much obliged to the right reverend gentleman for having read his paper. We have also to express our thanks to those who have taken the trouble to prepare and read papers at the meetings of the Institute during the past-year. Many of these papers have been very valuable, and those who have heard them read, or who have themselves read them afterwards, must, I am sure, have derived much benefit, and will be desirous of returning their best thanks to the authors.

The Bishop of BALLARAT: I have very great pleasure in seconding the resolution. I hope I shall be excused from making a speech, but I will offer one remark. It struck me, when the Bishop of Derry was reading the very luminous paper of the late Lord O’Neill, that it forcibly illustrated the truth, that we really ought not to be frightened at the formidable words and expressions which some Freethinkers make use of; because, when you come to look into them, you find there is really nothing whatever in them. They remind me of the passage in Shakespeare’s “Second Part of Henry IV.,” where the hostess, after listening to one of Pistol’s magniloquent but inane utterances, exclaims, “By my troth, captain, these are very bitter words.” And so they were to her, no doubt; but they meant absolutely nothing. (Laughter.) Some of the epithets applied to Christianity sound very alarming indeed; but, when one comes to examine them, the dismay and horror which are intended to be inspired altogether vanish. I second with great pleasure the resolution which has been proposed by Mr. M’Arthur and I very much congratulate myself, on the eve of returning to Australia,

at having been present at this meeting, and having heard so valuable and interesting a paper as that of the late Lord O'Neill.

The motion was unanimously agreed to.

The Bishop of DERRY : Perhaps I may be allowed to say just one word. I am sure it will be a great consolation to Lady O'Neill to hear of the favour with which her husband's most excellent paper has been received. The Bishop of Ballarat, in the remarks he made, spoke of things as they ought to be, and not, I am afraid, as they are. I am afraid that long words do make a great impression, especially on the minds of young men. Archbishop Whateley was in the habit of illustrating this by telling some of his friends a story about a lady to whom he gave some advice as to medicine for her children. When he told her to give them some tartar emetic she was horrified ; but when he said she should give them a little antimonial wine she replied that she would be very glad to do so. With reference to the paper itself, a nickname is very often a sort of condensed epigram. The very word "carpenter" throws ridicule on the larger idea of the creation, and the word "adulation" makes praise odious. I have to thank the meeting very much for the attention which they have bestowed upon the paper. Just to recall for one moment what Lord O'Neill was, I must say that he was a once a man of extreme modesty and a man of very singular gifts. If not a heaven-born mathematician, he was exceedingly able in mastering mathematical problems. His musical gifts were something marvellous. He was a learned divine and ripe scholar, and up to the last days of his life one of his greatest pleasures was to walk out with a friend and talk over with him a chapter of the Greek Testament. Above all and beyond all, his soul was based on a rock, and that rock was Christ.

Mr. D. HOWARD (Vice-Pres. Inst. Chemistry).—It is not without deep feeling that I rise to propose a vote of condolence to Lady O'Neill. The beautifully lucid paper to which we have just listened comes to us with the deep solemnity of a voice from beyond the tomb. These are almost the last words of one who had devoted all the exceptionally high powers of his mind to the highest uses, and is now gone to join the heavenly choir, where the music he loved so well here shall find its highest expression ; to that heaven where all the deep problems with which he dealt here find their true solution, to live for ever in the beatific vision of Him who is the Truth.

The thought of this is specially fitting for us as members of an Institute which seeks to harmonise all our intellectual powers with the life to come and to teach us so to pass our lives in things intellectual and philosophical that finally we lose not things eternal.

Mr. HORMUZD RASSAM.—Permit me to second this vote.

Bishop RYAN, D.D.—I have great pleasure in proposing that the thanks of this meeting be presented to Sir Henry Barkly, our chairman upon the present occasion. During some eventful years of my life I often had the pleasure of seeing Sir Henry Barkly in the chair at meetings in the distant land of Mauritius, where he was always ready to encourage scientific knowledge. I was very much struck with one of the speeches we have heard, and

in which we were told how we should proceed in our investigations so as to lead up from one question to another. That was Voltaire's method. Voltaire wanted to be an Atheist, and he could not. In such an assembly as this I need not scruple to give his own words :—"Ce monde m'embarrasse et je ne puis songer que cet horloge existe, et n'a par d'horloger. "This world troubles me. I cannot imagine how there can be this beautiful world, and yet none to construct it." I believe that real, honest investigation must always lead to points like this. A remark has been made about works of the Society being addressed to those outside. I remember an episode that occurred in Gosport on one occasion. There was a man there named S—who was in great trouble. I said to him: "S—, what is the matter with you?" He replied: "I have a set of fellows about me who are Atheists and Infidels, and I don't know what. They are plaguing me morning, noon, and night." I said, "take this book to them." It was Bishop Watson's answer to Tom Paine. Those who remember Paine's time know that his book was doing immense harm, and the Christian Knowledge Society brought out a cheap edition of Bishop Watson's reply. After S— had taken that book to his friends he said it fell like a bombshell among them. They who know the book know that Bishop Watson argues the whole matter learnedly and simply, so that the most ignorant and the most intelligent and well-informed can find something in it that will profit. I think that this Society should endeavour to bring out books of this kind, and see that they are clearly and simply written, and are circulated far and wide. (Hear, hear.) It does not do to tell the masses they must not read the works of our opponents, for they will read them. I am a good deal among the manufacturing population in Yorkshire. An artisan in Bradford came up to me in the street the other day and said: "Bishop Ryan, I am very much troubled in mind." I asked him why? He replied: "I have been reading Professor Tyndall's address at Belfast." I asked him how often he had read it right through? "Once," he answered. Then I told him that I had read it three times and suggested that he should read it again. The man did so, and his trouble vanished. The fact is, that we must show boldness, especially in this matter. With regard to other books, I have seen those containing gross and violent attacks on Christianity, and have kept them in my study, saying to those who came to me about them: "There are the books, read them if you like; but read also the answers to them." (Hear.) There was one remark made by the Bishop of Derry which was exactly what had been passing through my mind: It was with regard to Lord O'Neill's statement being deep and solid, and coming from the heart. With regard to Herbert Spencer, I think his accusing Christians of ascribing a love of adulation to God, only shows what straits men are in for an argument when they are driven to the use of such words. Let us all remember that whenever there is anything very startling we ought to examine it, and it may be that, as in this Institute, we shall find that in the discussion of infidel objections we come to the blessed truth of the

Word of God, by which we can carry the mind to that heaven into which His servants have entered.

Sir THOMAS GLADSTONE, Bart.—I have been unexpectedly called upon to discharge a very pleasing duty. Having been an intimate friend of the late Lord O'Neill, I am able to express my entire participation in every word that has fallen from the right rev. prelates who have just addressed you. Not one word they have said was undeserved by the deceased nobleman. It is not my intention, however, to intrude on you beyond making one remark with regard to the very able speech we have heard from the right hon. gentleman on my left, and in reference to the suggestion he has offered to this society, that it should produce such a work as he has so ably sketched out. I would venture to express a hope that he may himself put his shoulder to the wheel, and try what he can do in carrying out such a work. I now beg to second the resolution, which has been so ably proposed, of a vote of thanks to our Chairman. (Applause.)

The vote of thanks having been carried by acclamation,

Sir HENRY BARKLY said: I thank you for the compliment you have paid me, and which I have done so little to deserve. I have long taken great interest in the work of this Society, and it has been a privilege on my part to preside at so large and influential a meeting as this, and to have heard the late Lord O'Neill's paper. I believe the Society is doing a great work, and that it deserves support in its efforts to show that science, when properly cultivated, is not antagonistic to religious truth, but that they are really one and the same. I will not detain you longer, and can only repeat my thanks for the compliment paid to me.

The proceedings having terminated, the members and their friends adjourned to the Museum, where refreshments were served.

The Victoria Institute,

or

Philosophical Society of Great Britain,

7, ADELPHI TERRACE, STRAND, LONDON, W.C.

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Second.—To associate MEN OF SCIENCE and AUTHORS* who have already been engaged in such investigations, and all others who may be interested in them, in order to strengthen their efforts by association, and by bringing together the results of such labours, after full discussion, in the printed Transactions of an Institution, to give greater force and influence to proofs and arguments which might be little known, or even disregarded, if put forward merely by individuals.

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VOL. XV. (for 1881.)

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VOL. XVI. (for 1882.)

61. The Credibility of the Supernatural. (Ann. Address.) By the late Lord O'NEILL.
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The New Materialism Unscientific; or, Dictatorial Scientific Utterances and the Decline of Thought. By Professor LIONEL S. BEALE, M.D., F.R.S.
On the Living and the Non-Living. By the same.
On the New Materialism. By the same.
63. The Theory of Evolution taught by Hæckel, and held by his followers, Examined. By J. HASSELL, Esq.
The Supernatural in Nature. By J. E. HOWARD, Esq., F.R.S.
64. Materialism. By C. W. RICHMOND.

VOL. XVII.—(*First Quarterly Part for 1883.*)

65. The Recent Survey of Western Palestine, and its bearing upon the Bible. By TRELAWNEY SAUNDERS, Esq.; with the Speeches at the Annual Meeting.
Remarks on Climate in relation to Organic Nature. By Surgeon-General C. A. GORDON, M.D., C.B.; Speeches by Sir J. RISDON BENNETT, V.P.R.S., Sir JOSEPH FAYRER, K.C.S.I., M.D., F.R.S., and others.

THE EVOLUTION
OF
THE PEARLY NAUTILUS.

BY
S. R. PATTISON, Esq., F.G.S.

BEING A PAPER READ BEFORE THE VICTORIA INSTITUTE.

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THE EVOLUTION

OF

THE PEARLY NAUTILUS.

IT is a bold, perhaps a rash thing, to question a biological conclusion publicly expressed by the present distinguished President of the Royal Society. But no one would be more ready than he to encourage the pursuit of truth, and in the interest of the latter I offer the following remarks on the subject of evolution, in opposition to statements and inductions expressed by Professor Huxley in the Rede Lecture delivered at Cambridge in the month of June last, and reported in *Nature* of June 31, 1883.

The President defines the term evolution to mean "that the different forms of animal life had not arisen independently of each other in the great sweep of past time, but that the one had proceeded from the other; and that that which had happened in the course of past ages had been analogous to that which takes place daily and hourly in the case of the individual; that is to say, that just as at the present day, in the course of individual development, the lower and simple forms, in virtue of the properties which were inherent in them, passed step by step by the establishment of small successive differences into the higher and more complicated forms, so in the case of past ages, that which constituted the stock of the whole ancestry had advanced grade by grade, in

steps by steps, until it had attained the degree of complexity which we see at the present day.”*

This clear statement of the proposition amounts to an assertion that all the differences between life-forms, ancient and modern, have arisen from time to time by virtue of “inherent properties.”

The eloquent lecturer then sets himself to prove that this hypothesis coincides with the actual life-history on the globe. The evidence on which he relies is, that of the animal inhabiting the shell of the pearly nautilus, as compared with the indications presented by fossil shells of the same general kind. He selects from among the ancient fossils, one called an orthoceratite, a perfectly straight form; he takes this and claims for it the distinction of having been the father and founder of the whole nautiloid tribe. He says that it first underwent a slight curvature and became the *cyrtoceras*; in course of time the curving and rolling up of successive individuals became gradually more and more complete, until it finally issued in the beautiful *Nautilus Pompilius* of the present seas. That the proposition may be more fully before you, I quote further from the report:—“Unquestionably, nautili were found as far back as the Upper Silurian age. Before that time there were no nautili, but there were shells of the orthoceratidæ—of which there were magnificent examples before him—which resembled those of the nautili in that they were chambered, siphoned, &c., with the last chamber of such a size that it obviously sheltered the body of the animal. He thought no one could doubt that the creatures which fabricated these still earlier shells were substantially similar to the nautili, although their shells were straight, just as a nautilus shell would be if it were pulled out from a helix into a cone. Then came the forms known as *cyrtoceras*, which were slightly curved. Along with these they had the other forms which were on the table, and in which the shell began to grow spiral. The next that came were forms of nautilus, which differed from the nautilus of to-day in that the septa were like watch-glasses, and that the whorls did not overlap one another. In the next series, belonging to the later palæozoic strata, the shell was closely coiled and the septa began to be a little wavy, and the whorls began to overlap one another. And this process was continued in later forms, down to that of the present day. Looking broadly at the main changes which the nautilus stock underwent, changes parallel with those which were followed by the

* Rede Lecture, *Nature*, June 21, 1883, p. 189.

individual nautilus in the course of its development, he considered that there could be no doubt that they were justified in the hypothesis that the causes at work were the same in both cases, and that the inherent faculty, or power, or whatever else it might be called, which determined the successive changes of the nautilus after it had been hatched, had been operative throughout the whole continuous series of existence of the genus from its earliest appearances in the later Silurian rock up to the present day."

This was his case for evolution, which he rested wholly upon arguments of the kind he had adduced.

Will it surprise you to be told, after this, that not only is the argument hypothetical, but the facts are hypothetical too? for in the British rocks, and presumably elsewhere, the orthoceras never turned into a cyrtoceras, for the simple and sufficient reason, that the latter actually preceded the former.

They both appear in the same geological day, the epoch of the upper Cambrian, but the cyrtoceras is the first in the field.* After their first appearances both subsist, fully formed and equipped for the campaign of life, both preserving their respective identities, quite distinct from each other, both subsequently become scarce, and disappear. Whilst they lived together side by side in the Silurian times, new genera and species were added to each until there came to be no less than 143 distinct creatures, going down from age to age in lineal descent belonging to the orthoceras group, and 369 belonging to the cyrtoceras, enjoying the same surroundings in every respect, but each species keeping to its own model.

Professor Huxley accounts for the multiplication and variety of these creatures by the hypothesis that the cyrtoceras is an orthoceras in the first instance curved by accident or by external conditions, that thenceforward this individual produced progeny similarly curved, and then similar causes produced like occurrences in succession until the thousand varieties of cephalopodous life thus arose, and what occurred in one group happened also in all, and hence the variety displayed throughout the animal kingdom. Now, whatever else may have been the true history of the origin of the great

* Salter's appendix : *Memoirs of Geol. Survey*, vol. iii., p. 358. "It is the earliest of the Cephalopods known, and it is not a little remarkable that the first species we meet with in ascending order should be—not orthoceras, which is the most diffused and persistent form, but a genus which, so far as we know, is only Silurian and Devonian."

decayed cephalopodous family, I hope to show you that this is not its true pedigree, that the straight orthoceras is not the root of title.

But the President has a right to say that he needed not to ground his argument on the evidence of British rocks alone, nor place it on so narrow a basis as the mere form of the shell. This must be granted. Subsequently to the delivery of his lecture, a most potent ally has come forward in the person of my friend Professor Alpheus Hyatt, the Curator of the Natural History Society of Boston, in Massachusetts, who has devoted all the powers of an acute intellect, large experience, and ample opportunity on both sides of the sea, to the investigation of this very subject, and who has just published, in the proceedings of the Boston Society, his adoption of evolutionary views and of the theory of Professor Huxley. Notwithstanding this, I will try to lay before you the reasons which, in my judgment, are decisive against the conclusions of these eminent men. In doing this, I shall have to trouble you with some dry details of geological, or rather palæontological facts regarding the succession of rocks, and of the life indicated by their fossil contents.

We have first to speak of the shells.

The nautilus is, as is well known, the sole living representative of a vast family of marine creatures, which flourished in the first palæo-ontological ages, and are known to us in a fossil condition under various names. In the lowest strata the form called orthoceras prevailed, though, as we have shown, it does not appear first. In subsequent times the coiled ammonite is the prevailing form. The latter is so numerous in the rocks that its remains stand as the popular type of fossil life in general.

These creatures belong to the group of cephalopods, the highest form of animal life existing in marine shells. They derive their distinctive class-name from their having the feet placed in a ring round the mouth.

The commonest cephalopod now known to us is the cuttle-fish, which has an internal calcareous support; the most beautiful, externally, is the pearly nautilus before referred to. The nautilus has two pair of gills, the cuttle-fish only one pair, and the whole assemblage is divided into two families possessing this difference,—the one called the dibranchiates, the other the tetrabranchiates. The former, the cuttle-fish kind, are the most numerous in the present seas; but in the ancient oceans the nautiloids prevailed, and formed really the leading feature in the life of the period, so far as we know. The London clay immediately beneath where we now stand contains

the shells of numerous species of true nautili, and so does the chalk beneath, whilst that, and the oolites lying next below, abound also in ammonite forms, and the still underlying rocks are thickly strewn with other members of the great tribe.

For the present investigation it is only necessary to dwell principally on two leading forms,—the old straight fossil orthoceras, and its companion called the cyrtoceras, differing from the former in being slightly curved.

The chief home of the orthoceras and cyrtoceras is in the Silurian, both are also found in the Devonian. They begin to be supplanted by other genera in the carboniferous limestone, abound in profusion, in the guise of ammonites, in the Jurassic; rapidly decline and become feeble in the tertiaries; and, save as to the nautilus, are extinct in the present world.

The shell of the orthoceras appears to have resembled that of the pearly nautilus in that it was divided by shelly partitions (called septa) into numerous chambers, connected only by a tube called the siphuncle, running through the septa, and terminating in the body of the animal. The latter evidently lived in the last and largest chamber, the other chambers acting as floats, the siphuncle keeping the chambers in a living condition. The shell of the present nautilus is always completely and elegantly curved, whereas that of the orthoceras is always straight. There are other differences, but the argument of the Rede Lecture is founded on this one distinction. It assumes that the straight form became casually curved in some one individual, whence sprung other similarly curved creatures now named cyrtoceras. A multitude of such casual variations, becoming fixed from generation to generation, constituted the cyrtoceras tribe, whilst some other casual adventure or adaptive habit produced further coiling up and corresponding changes, which resulted in the populous races of ammonites and the persistent nautilus.

We may incidentally remark that both shells, thus claimed as parent and child, have ornaments in the shape of furrows and lines, probably with colour (of which some traces have been seen), thus displaying similar regularity and beauty to the features possessed by their modern representatives. It serves still further to connect the present with the remote past, to learn that the shells of these fossil orthoceratidæ afford, in some instances, marks of having been broken during life, and repaired again by the animal. The very dawn of life on the earth is chequered by ruin and restoration. The cephalopods were the monarchs of the sea, and, indeed, of creation, for there are no remains of fishes, and we have no trace, in the earliest formations of any land animal. There are

orthoceratites upwards of ten feet long. Their function appears to have been to keep the seas clear of superfluous animal matter. No one who has looked a cuttle-fish in the face would wish to cope with an enlarged addition of the uncanny creature, however beautiful its shell might be.

Having now described what we are to look for in past life, I must briefly refer a little more fully to the places where we are to make our search.

The lowest group of sedimentary rocks is called the Laurentian, largely developed in Canada, where it was first distinguished and named. This is estimated at 30,000 feet thick, and consists of gneiss, quartz-rock, and limestone, with occasional beds of graphite. The old granitic rocks of the West of Scotland, and the hard, dark rocks of Skye, are supposed to belong to this series. No trace of organic life has been seen in any part of this vast formation, with the single exception of the masses of eozone, a foraminifer developed and elucidated by the happy labours of Dr. Dawson, of Montreal. Next to the Laurentian, lying upon it, comes a series of coarse, hard rocks, called the Huronian, in which no fossils have yet been found. The reason for placing the Huronian over the Laurentian is that the former lies unconformably on the upturned edges of the latter. Next in the ascending scale is the series in which our best slates are found in Wales, and hence called the Cambrian. These show, in some of their layers, very numerous remains of small marine animals, including a bivalve mollusc called *Lingula*. The *Lingula* zone is the equivalent of the Potsdam sandstone of North America, and of the primordial zone in Bohemia. The Skiddaw slates in Cumberland, and the Quebec group and calciferous slates of New York county are also on this horizon. The assemblage of organic life shown by these rocks displays the well-known curious crustaceans as called trilobites, with great numbers of graptolites, and some shells and sea-urchins but no cephalopods. Next in our upward course occurs a series of slaty rocks, named, from the place where they were first distinguished, the Tremadoc slates. These are on the upper Cambrian level, and contain a distinct collection of animated life, still marine only, and numbering, for the first time, cephalopods. Amongst these latter the bent form, *cyrtoceras*, occurs in the lowest beds, and the straight form, the *orthoceras*, over them, as may be seen, at Tremadoc, in North Wales.

Dr. Blake, the chronicler of the British cephalopods, writes:—"The first to appear is *cyrtoceras*, represented by *C. præcox*, though followed in the uppermost division of the

same rocks by *Orthoceras sericeum*. It has been thought remarkable that the less simple forms should precede the straight orthoceras; but the history of discovery shows that we can place but little trust in such an isolated fact as it is liable any day to be reversed.* Although, therefore, we might be able to claim for the cyrtoceras the distinction of being the primal cephalopod, and so show the impossibility of its having, as the President thought, descended from orthoceras, yet we decline to snap a verdict in this manner, lest it should be reversed on a new trial by the production of further evidence. We prefer to open the question and look at all possible evidence in support of the Professor's proposition.

Those who have to plead for evolution from the orthoceras do not affirm that this was the first creature of its kind, but the first creature of present kinds. They assume the existence of some earlier stage of life (of which, however, we have no evidence whatever), in which there existed earlier and simpler creatures whence either cyrtoceras or orthoceras proceeded, or both. Palæontologists know nothing of this. Mr. Hyatt admits that "in all the larger series of shell-bearing cephalopods the nautiloid shells belong to several distinct series," which, he states, "arose independently from straight cones through the intermediate graded series of arcuate and gyroceran or clearly coiled forms." He lays it down that the ammonites are evidently descendants of the nautilinidæ, and that the evidence is strong that the whole order arose from a single organic centre, the nautilus of the Silurian, or the orthoceras of the Cambrian. But how is this statement consistent with the conclusion of the same writer,† that the study of the tetrabranchs teaches us that, "when we first meet with reliable records of their existence, they are already a highly organised and very varied type, with many genera." They must have had ancestors now unknown to us, "but at present the search for the ancestral form is, nevertheless, not hopeful."

When you visit the grand, capacious Natural History Museum at South Kensington, you find, in the department devoted to molluscan fossil remains, one room—the first, appropriated to cephalopods. The first cases on the right, as you enter, contain the orthoceratites, and next to these are the cyrtoceratites. This relative position is not indicative of order in time, but of apparent simplicity of form. The distinction between the two forms is immediately perceived. The cephalopod room is well worthy of study in the light of the early appearance of these creatures on the earth, and their apparently

* Blake, *British Cephalopoda*, p. 238.

† *Science*, Feb. 1, p. 127.

sudden and general diffusion. Mr. Hyatt, in his work of careful analysis, describes and names 137 genera of the tetrabranchiates, all well marked by permanent transmissible and transmitted differences. The greater number of these arose during the very early period of the life of the globe. It is, of course, conceivable that all these were the results of a natural law, seated in the first and simplest specimen, nor, of course, would this conclusion be at variance with the strictest theism. We might believe that the curved form issued from the straight, and the coiled-up creatures with fringed partitions grew out of the simple ones with even septa; and, again, that the forms uncoiled and ultimately again became straight as in the bactrites of the chalk. But we have no instance whatever, in the whole field of nature elsewhere, of any such series of changes. Time works wonders, it is said, but does not work wonders *per se*.

On further inquiry into the relative numbers of the two forms, taking the "painful" labours of good Dr. Bigsby as our guide, we learn that there are in the Silurian rocks 317 species of the extinct cyrtoceras, and 143 of orthoceras. In the succeeding formation, the carboniferous, there are registered 24 of cyrtoceras and 114 of orthoceras.*

We have thus the contemporaneous existence, through untold ages, of these two typical forms of life, remarkably alike, yet also actually different; each species resembling the other accurately, in all but the minute characters which separated them; each genus and species pursuing its own way without change from age to age in the presence of countless individuals of other genera and species living under precisely similar conditions, yet the two families, the orthoceras and cyrtoceras, ever remain distinct; no more changed by their environments than Egyptian mummies in their grim companionship, each enfolded in its own multitudinous wrappings. As Professor Hall, of Albany (who has probably seen more of these fossils than any one else), said to me last summer, "An orthoceras was always an orthoceras and nothing else, and a cyrtoceras was always a cyrtoceras, and nothing else."

I wish, therefore, to maintain that the one is not a variation from the other, but a distinct thing, so far as we have actual evidence; indeed modern geology is largely based on the permanent or constant distinctions existing between organic fossils.

Prolonged experience has only strengthened the conclusion drawn by William Smith, the father of English geology,

* Bigsby's *Thesaurus*: *Silurian*, 1860; *Devonico-carboniferous*, 1878.

nearly a century since, that strata may be identified by organic remains. Most of the species of the latter prevalent in one formation are peculiar to it, whilst some survive through two or more of the successive stages of the solid deposits of the earth; new forms come in at every stage; and, until some competent second cause can be established accounting for these new appearances, we must perforce call them creations. The similarity of the new forms to the old, and the harmony of the whole, oblige us to term it creation by law, a law very similar to evolution, for the forms succeed each other with differences so slight, that, but for the permanency of the effects, they might be frequently assigned to casual variation. But the results appear to show that every step requires and displays some fresh adjustment, the exercise of a mind *ab extra*. What differences in organic life may be classed as mere modifications, and what may be deemed new departures, must be the subject of protracted observation, and perhaps of dispute, but the distinction is not the less real for this. The researches of Mr. Darwin, though not successful in piercing the mystery of the *modus operandi*, have yet taught us much concerning the limits of variability. They certainly have not established the fact of unlimited variability, which would be requisite for the maintenance of the theory of evolution.

Reverting to the main scope of the present argument, I have to state that, so far as we know, the cyrtoceras and the orthoceras were the first creatures of their class. Previous to their appearance, the rocks show the presence of molluscs of entirely different and lower type. It is not pretended that amongst the latter any ancestor of the cephalopods can be detected. It is certain, says the accomplished Monsieur Gaudry, that the extinct kinds had no influence whatever in the formation of their successors. In palæontology evolution subsists only as a mental conception; as we have seen, the two leading forms which are selected by the Rede lecturer, were present at the earliest life-period of which we have any trace of anything at all like them.

Of course, the differences in the form of the shell are simply indicative of differences in the contained animal. We have no difficulty in concluding that a constant transmissible difference in the form or curvature of the shell, is the result of a similarly constant difference in the living animal.

One internal difference between cyrtoceras and orthoceras is in the usual position of the siphuncle, the tube which runs from the body of the animal backward through the chambers. In orthoceras, though not absolutely invariable, yet it is very nearly so, so much so as to be considered characteristic,

whereas in cyrtoceras the siphuncle is placed sometimes on the dorsal, sometimes in the ventral margin, "and in every conceivable position between these two points."*

Both the orthoceras and the cyrtoceras are nautiloids, and commence life alike in one respect, namely, with conical nuclei or ovisacs, as distinguished from the rounded ovisacs of the subsequent ammonites.

Professor Huxley would have us infer that the ammonite is a modified orthoceratite, but the present state of our knowledge does not confirm this. Monsieur Gaudry, one of the great masters in this science, when writing on the ovisacs, lays it down as follows:—"We must admit that this difference, shown so plainly in the upper Silurian epoch, is, in the present state of our knowledge, an argument of weight against the idea of linking together the whole creation."† Since the researches of Professor Hyatt this characteristic has lost some of its value; but, although he traced in one or more genera the existence of an ammonitoid nucleus, yet, in the vast majority of instances, the old radical difference obtains. As Dr. Blake says:—"We may here learn those characters which point to the origin of the forms possessing them, and any fundamental distinction found will prove a bifurcation of the group."‡ The little cap, or ovisac, is by Sir Richard Owen called the protoconch, and is a distinguishing mark of origin in the vast majority of cases.

Mr. Hyatt lays much stress on the embryological facts which he considers that he has established, that every individual curved cephalopod began life as a straight embryo, becomes curved in its growth, completes its curvature at maturity, has a tendency to uncoil as it arrives at old age. He finds in this life of the single creature a representation of the life of the tribe, and argues that in both cases alike the growth is purely natural, and, as it were, self-contained. Surely this is analogy and not natural history. The tribal and the individual life may thus be parallel in part only. He himself says elsewhere:—"We cannot say that the causes which produced old age, and those which in time produced retrogressive types were identical."§

It seems obvious, therefore, that no reliance whatever can be placed on the argument from embryology.

It is admitted that the marvellously rapid introduction of new species of these two orders in the Silurian epoch is

* Salter, *Memoir by Ramsay, North Wales*, vol. iii., p. 374.

† Gaudry, *Les Enchaînements du Monde*, &c., p. 173. ‡ *Fossil Cephalopoda*, p. 24. § *Science*, February 8, p. 149.

contrary to all our experience of rate of change at present: two assumptions have to be made to get rid of this difficulty; first, the usual one of inconceivably long periods of time; and, secondly, the supposition that the changes took place with far greater rapidity than now, of which, however, there is no proof whatever. On the contrary, the force of heredity is said to be always greatest nearest to the origin of the form. It is a somewhat singular circumstance, and not without a bearing on our question, that in the case of the ammonites we find the first forms closely coiled, but one of the principal last forms—the bacuities—is absolutely as straight as the orthoceratite. If the process from the straight form to the curved is to be called evolution, by what name shall the reverse be distinguished? I show you a bacuities, that you may see that it is not merely an uncoiled ammonite, any more than an orthoceratite is not merely an uncoiled nautilus,—but both are distinct forms, not degenerate but independent creatures.

The importance of the subject, as now elevated into a test case, must be my apology for adducing some authorities on both sides, in addition to those previously mentioned.

We may quote on the one side the utterances of Professor Flower at the recent Church Congress at Reading, who boldly says:—

“The opinion now almost, if not quite, universal among skilled and thoughtful naturalists of all countries, and whatever their beliefs on other subjects, is that the various forms of life which we see around us, and the existence of which we know from their fossil remains, are the product, not of independent creations, but of descent, with gradual modification from pre-existing forms.”* He afterwards, however, states that direct proof of the theory is wanting.

On the other hand, Dr. Duncan, in his presidential address to the Geological Society in 1878, comments on the difficulties of evolution in reference to the nautiloids as follows:—“Every student of palæontology must be impressed at the commencement of his studies with the excessive variety of form displayed by the tetrabranchiate cephalopoda, and when informed that it is produced by natural selection wonder is felt that the shapes assumed had a curious resemblance during the same geological age over the whole world, and that the genus *Nautilus* should have remained so little altered in spite of the struggle for existence, the survival of the fittest, sexual selection, and adaptive modification.”†

* *Nature*, October 11, 1883. † *Quarterly Journal, G. S.*, vol. xxxiv., p. 68.

To oppose my able friend Alpheus Hyatt, I would call up the old renowned chief from Bohemia. The Silurian rocks of that country were patiently examined during a lifetime by the high intelligence and industry of Joachim Barraude. They present most favourable conditions for the search; in no less than 665 species of cephalopods, crowded in a succession of strata generally similar in mineral composition, the phenomena of progressive life forms are abundantly displayed. Barraude writes that he was much struck with the *contemporaneous* appearance of orthoceras and cyrtoceras; and on the whole subject, as the result of his studies, he states that the facts positively forbid the conclusion that "the numerous and varied specific forms of each generic type are derived from each other by a slow and imperceptible transformation, under the influence of the surrounding medium."

Again he writes in his great work:—"In short, the differences between the zoological and chronological evolution of the cephalopods are so great and so plain that it is impossible to recognise any harmony between the two series; but both, being equally founded on facts and considerations outside all arbitrary influence, have their origin in the laws of nature.

In the face of these difficulties, theory can have recourse to the usual excuse, based on the lack of sufficient palæontological evidence. It can also call in either the unfailing resource of infinite and boundless ages of time before the beginning of the palæozoic era, or finally complete destruction of the organic remains in the metamorphic rocks."

Reverting again to a theory which would connect the cephalopods in the chain of evolution, he says:—"Although it is impossible to compare with accuracy the periods when the cephalopods made their first appearance in different countries, we may consider as the oldest representatives of this order those which appeared in Canada and England before the complete establishment of the second fauna. We must then be astonished at seeing that in these two countries the first forms belong to two different types. Thus in Canada there are found small orthoceratites in the passage-beds between the Potsdam sandstone and overlying series; in England, on the other hand, the first form is a little cyrtoceras of the Tremadoc fauna."*

And still further:—"In other words, the absence of the cephalopods in the primordial fauna cannot be reconciled with any hypothesis which would tend to carry over the origin and

development of these molluscs to a pre-Silurian period. We are, therefore, obliged to give up this hypothesis in order to explain the simultaneous appearance of numerous specific or generic forms of this order at very distant spots on the surface of the globe about the time of the origin of the second fauna.

After the facts and considerations which have gone before, the disagreements shown between the zoological and chronological evolution could not be made to disappear, either before the excuse of the lack of sufficient palæontological evidence, or before the hypothesis of a series of antepre-mordial faunas, or before the supposition of the total disappearance of the vestiges of these faunas through the effect of the metamorphism of the rocks.

These disagreements, then, remain in science to show us that the order of the cephalopods, that is, the first order among molluscs, by its organisation, as well as by its numbers, its variety, and the strength of its representatives during the Silurian ages, altogether eludes the ideal combinations which would tend to derive its origin and its primitive form from an imaginary individual, by an indefinite succession of imperceptible variations before the palæozoic era. This bears witness to the powerlessness of theories or self-made explanations to reveal to us the means by which it has pleased the Creator to introduce organic life upon the globe, and to provide for the succession and development of the types which should represent them, each one in the period which has been assigned to it by eternal wisdom."

So far Barrande.

M. Gaudrey, one of the ablest of living palæontologists, an evolutionist, concludes his statement of the case with the following important sentences:—"But, to be strictly correct, it must be added that, in the actual state of our knowledge, we are scarcely permitted to pierce the mystery which envelopes the primal development of the great classes of animal life. No one knows the manner in which the first creature of the foraminifera, the polyps, the jelly-fishes, the urchins, the brachiopods, the bivalves, the ostracods, the univalves, the trilobites, the decapods, the myriapods, the insects, the spiders, the fish, the reptiles, &c., appeared. The most ancient fossils have not yet furnished us with positive proof of the passage of animals from one class to another class."†

I sum up by claiming, on the issue of evolution by the

* *Syst. Silu de la Bohême*, ii., p. 157.

† Gaudrey, p. 292.

influence of external circumstances or internal growth, a nonsuit, or a verdict of "not proven," as well on the evidence as on the admissions in the cause.

But testimony of all kinds appears to be readily set aside by the fascinating, flattering power of the doctrine of evolution. The proposition is repeated so loudly and continuously that it has begun to be accepted as an axiom, not to be questioned. It goes without argument. When a term becomes popular, it invariably comes to be used in a loose sense. Evolution, strictly, can only apply to action taking place in the subject; but, in a looser sense, it is now used to express the successive additions to the subject derived from any source. It is used to include all effects produced by a guiding principle or a possible accident. In order to account for the origin of a species, it is popularly held that nothing more is required than to show one very near to it, and thus resemblance is magnified into cause and effect. But surely permanent differences must indicate the action of corresponding constitutional powers. Naturalists find barriers, which they treat as boundary lines, only because they are so. They call the assemblage of facts within areas so bounded a species, and claim for it an independent origin, and call the mode in which this was brought about creation, for want of any adequate secondary cause. The common sense and common speech of mankind are on their side. Either cephalopods must have been derived from some simpler form, by minute stages of difference, or, they must have been originally created as we now find them, and if the latter supposition which we have seen, is an hypothesis surrounded with difficulties hitherto unsurmounted, requires the multiplication of miracles, we are not alarmed at this conclusion. Up to the present day the domain of natural history has been searched in vain for any second cause adequate to produce the permanent difference between races. Evolution may be a plausible guess, it may be a working hypothesis, but I do not think it bears examination; and there are those who properly say, Why should we resort to guess-work when another department of knowledge gives us the plain, simple truth, God made "everything after its kind"?

Mr. Bouverie Pusey, recently here, successfully established the proposition that variation in the animal kingdom is limited and exceptional. The law which has ruled the existing differences must be a manifestation of creating, and not merely of unfolding. The direction of the will-force was evidently in such lines as to make the successive subjects as nearly alike as possible compatible with ordered essential

differences. The divine skill with which this has been accomplished appears to be the source of our embarrassments. Permitted variations necessary for life under actual conditions render the problem still more puzzling, and give us ample room for experiment and observation to distinguish between constant and inconstant differences ; but this need not drive us to despair, for we do not choose to contemplate nature apart from God. It has been well said by Canon Westcott, that "theology accepts, without the least reserve, the conclusions of science as such ; it only rejects the claim of science to contain within itself every spring of knowledge and every domain of thought."* Nor are we justified in substituting imagination for reason. Let us, by all means, use analogy, fancy, and poetry for our enjoyment and delight, they are beautiful and profitable modes of thought ; but, in constructing the Temple of Science, we may use them as embellishments, not as building materials.

* *Gospel of the Resurrection.*

THE VICTORIA INSTITUTE.

THE ANNUAL ADDRESS
ON
THE CUNEIFORM INSCRIPTIONS
AT
TEL EL-AMARNA.

(Of about the 15th century, B.C.),

BY

THE REV. A. H. SAYCE, M.A., LL.D.,

Deputy Professor of Comparative Philology in the University of Oxford.

With an outline of the Report.

Speakers :—

The Right Honourable THE LORD CHANCELLOR, Sir HENRY BARKLY, K.C.B.,
F.R.S., Admiral Sir ERASMUS OMMANNEY, C.B., F.R.S., Admiral Sir F. LEOPOLD
McCLINTOCK, F.R.S., Sir J. RISDON BENNETT, F.R.S., Captain CREAK, F.R.S.

THE PRESIDENT, SIR GABRIEL STOKES, BART., M.P.,

President of the Royal Society, in the Chair.

July, 1889.

THE VICTORIA INSTITUTE,
ADELPHI TERRACE, STRAND, W.C.,
LONDON.

NOT TO BE BOUND WITH THE VOLUME.

SUMMARY OF THE PROCEEDINGS AT THE TWENTY-
THIRD ANNUAL MEETING OF THE VICTORIA
INSTITUTE, HELD AT THE HOUSE OF THE
SOCIETY OF ARTS, 1 JULY, 1889.

THE PRESIDENT, Sir GABRIEL STOKES, BART., D.C.L., M.P.,
President of the Royal Society, IN THE CHAIR.

The Report (see overleaf) having been read by the Honorary Secretary, Captain FRANCIS PETRIE, F.G.S., &c.,

Sir HENRY BARKLY, K.C.B., G.C.M.G., F.R.S., moved the adoption of the Report, and referred to the important advances made by the Institute and the great value of its existence.

Admiral Sir F. LEOPOLD MCCLINTOCK, R.N., F.R.S., seconded the adoption of the Report, and complimented the Council on the excellent way in which their work had been done.

Mr. DAVID HOWARD, F.C.S., &c., returned thanks on behalf of the Council "whose anxious task had been so kindly recognised."

Professor A. H. SAYCE'S ANNUAL ADDRESS was then read by the Rev. W. WRIGHT, D.D. (Author of "The Hittites") at the Author's request (family matters preventing his presence).

The Right Hon. the LORD CHANCELLOR (Vice-President) moved the vote of thanks to the authors of the papers read during the session, especially to Professor SAYCE for his valuable and interesting Address, pointing out the usefulness, in the present day, of such work; he also complimented Dr. WRIGHT on the way he had done his part.

M. NAVILLE, (the discoverer of Pithom, Bubastis, and other important cities in Egypt), cordially seconded the resolution, and characterised Professor SAYCE'S work as the most important discovery of the present century.

Sir J. RISDON BENNETT, F.R.S., then moved a vote of thanks to the President, which was seconded by Admiral Sir ERASMUS OMMANNEY, R.N., C.B., F.R.S., and conveyed to the President by Staff-Commander ETTRICK W. CREAK, R.N., F.R.S.

The Meeting then adjourned to the museum, where refreshments were served.

..* The large meeting filled the hall and vestibule.

SUMMARY OF THE REPORT.

THE REPORT STATED :—

That in no year since its foundation in 1865 had the Institute's practical work advanced so effectually and decidedly as during the past year. The steady support which both Members and Associates accorded, and the increased number of those in the high walks of Science who co-operated with the Institute, were of the utmost value, giving solidity to the Institute, strengthening its working, and causing many who might otherwise not have joined or aided in its work to do so. The remarkably few retirements had also shown how fully all realised the desirability of making use of the present opportunities of advancing a Society the value of whose aims were recognised by all thoughtful men. Such cordial co-operation was of inestimable value to the Institute and its objects.

That the Institute now numbered upwards of one thousand three hundred Members and Associates, of whom upwards of four hundred were resident abroad, (in India, the Colonies, the United States, and other countries).

That the system under which papers were read, and the discussions and comments thereon published, now enabled Members in the most distant parts of the world to contribute papers, and to take part in the discussions.

In reference to the issue of Vol. XXII. of the Journal, that much of the Institute's work tended to aid science, and much, of a special character, tended to show the errors of those who sought to attack Religion in the name of Science.

That the Institute's American offshoot was progressing satisfactorily, and that, although an independent society, its existence had not lessened the amount of American support to the Institute.

That the need of an increase in the Library fund was desirable, as new works of reference were required, and the expenses in connexion with the new arrangements rendered necessary by the change of the Society's residence,* fell on it.

* The sudden sale of the Institute's former house rendered it necessary to find new premises during the height of the session. The great difficulties encountered were most successfully overcome.

The Report also referred to the Institute's usefulness to Members, &c., all over the world, and to its carefully-planned organisation.

The Papers read were * :—

Meetings.

MONDAY, DECEMBER 3.—“On some of the principal Races mentioned in the Bible” (with illustrations from the Babylonian, Assyrian, and Egyptian Monuments). By Rev. H. G. TOMKINS.

MONDAY, JANUARY 7, 1889.—“On Colours in Nature.” By Rev. F. A. WALKER, D.D., F.L.S.

MONDAY, JANUARY 21.—“Investigations on the Sciences of Language and Ethnography.” By Dr. LEITNER.

MONDAY, FEBRUARY 4.—“The Factors of Evolution in Language.” By JOSEPH JOHN MURPHY, Esq. With Notes by Professor F. MAX MULLER, D.C.L.

MONDAY, FEBRUARY 18.—“Scientific Research and Revelation.” By C. S. WILKINSON, Esq., F.L.S., F.G.S., Pres. Royal Society of New South Wales.

MONDAY, MARCH 4.—“The Meaning and History of the Logos of Philosophy.” By Rev. H. J. CLARKE.

MONDAY, MARCH 18.—“The Dawn of Metallurgy among Primitive Races.” By Rev. J. M. MELLO, M.A., F.G.S.

MONDAY, APRIL 1.—“On the Creation Tablets.” By Professor WARRING. Ph.D.

MONDAY, APRIL 15.—“On the Ethnology and Ancient Chronology of China.” By Surgeon-General GORDON, C.B., Hon. Physician to the Queen.

MONDAY, MAY 6.—1. “On Cuts on Bones as Evidence of Man's Existence in Remote Ages.” By Professor T. McK. HUGHES, M.A., F.R.S., Woodwardian Professor of Geology at Cambridge University; with comments by Professor RUPERT JONES, F.R.S., and others.

2. “Modern Science and Natural Religion.” By Rev. C. G. ASHWIN, M.A.

MONDAY, MAY 20.—A Paper on “The Early History of Eastern Nations and their Language.” By Major CONDER, D.C.L., R.E., late Palestine Survey (now of the Ordnance Survey); with comments by several leading Philologists.

MONDAY, JUNE 3. *Extra*—1. On “The Butterflies and Moths of Africa.” By W. F. KIRBY, Esq. (British Museum).

2. “Niobe, or Neferura-Urmaa,” the daughter of the King of the Hittites.” By the Rev. F. A. WALKER, D.D., F.L.S.

MONDAY, JULY 1.—*Annual Meeting at the House of the Society of Arts*: Address on “The Cuneiform Inscriptions at Tel El-Amarna,” by Professor A. H. SAYCE, LL.D., Dep. Professor of Comparative Philology to the University of Oxford.

Second Extra Meeting at the House of the Society of Arts: Paper by M. EDOUARD NAVILLE on “The Historical Results of the Excavations at Bubastis, &c.”

* Some of the papers read before the Institute are of a more popular kind, and others are careful investigations of important questions in philosophy and science (object 1). These papers and the discussions thereon are of the highest value in furthering the great objects for which the Institute was founded, and the aid of the most distinguished scholars (whether Members or not) is deemed of special importance at all meetings at which these questions are considered.

ADDITIONAL REMARKS.

Among several other matters—the report referred to the importance of an increase of “The Special Fund” used in extending the library of reference, in publishing summaries of important papers, and in organising the publication of the twelve papers in the People’s Edition throughout the world.

[The papers in this edition were often accompanied by the objections and criticisms urged in discussing the subjects, many home and foreign correspondents having urged the value of including these. Single copies were supplied gratuitously or at cost price to all individual lecturers against that infidelity which arose from a misapprehension of the true results of scientific inquiry : including those of the London City Mission, the Christian Evidence Society, and similar bodies at home and abroad.]

Finally, the report said :—“ The present organisation has proved to be admirable, and it needs but an effort on the part of each of the present members and associates to increase the number of supporters, and thereby add to the power of the Institute for good.”

On Some Uses made of the Institute by its Members.—Last year it was pointed out that to many Members their connexion with the Institute had proved more than a mere personal advantage to themselves ; as they found that the Institute met a need felt in their neighbourhood, whether at home or abroad, especially in our Colonies and India, where the want of the true appreciation of the actual results of scientific enquiry has led many, especially the less informed, to credit such statements as that “ Science and Philosophy were alike opposed to Revelation,” and that “ the progress of Science has given a death-blow to all belief in the truth of the Bible.” (As one result of this the Bible is a forbidden Book in more than one Board School at home and in our Colonies). And many have sought to make use of the Institute’s investigations to dispel such erroneous ideas as those referred to, (I) by using the papers in the Journal as lectures, or to lecture from, in their respective localities, often corresponding with the Institute as to the preparation of such lectures ; (II) by reprinting portions of the Journal in foreign and Colonial journals, translating papers (in many countries) ; (III) by using their influence in their respective localities to secure that local libraries and institutions should subscribe for the Journal, thus bringing its pages before a still wider circle of readers ; (IV) by interesting others in its proceedings, and in many other ways which the Council trust may be even more generally adopted.

THE VICTORIA INSTITUTE ANNUAL

ADDRESS, 1889.

THE CUNEIFORM INSCRIPTIONS OF TEL EL-AMARNA. By the REV. A. H. SAYCE, M.A., D.D., LL.D., Deputy Professor of Comparative Philology in the University of Oxford.

THE winter before last, one of the most extraordinary and unexpected archæological discoveries of modern times was made in Upper Egypt. Egypt has always been the land of archæological surprises, but its last surprise is, perhaps, the greatest that it has ever afforded us. About midway between Minieh and Assiout, but on the eastern bank of the Nile, are the extensive mounds of an ancient city, now known under the name of Tel el-Amarna. They cover the remains of the capital built by Amenophis IV. or Khu-en-Aten, "the heretic king," as he is familiarly called in the histories of monumental Egypt. Alone among the Pharaohs of his country he deserted the religion and traditions of his fathers, and endeavoured to impose upon his unwilling subjects a new form of faith. Forsaking the worship of Amen of Thebes, of Ra of Heliopolis, of Ptah of Memphis, he professed himself the devoted adorer of the radiant solar disk, in which he saw the image and symbol of the Supreme Deity.

The worship of the solar disk points unmistakably to

*Address :—*Victoria Institute, 1889.

Syria. It was here that the Sun-god was the central object of worship, adored, though he may have been, under various manifestations and forms. It was here, too, that his special symbol was the solar disk, with wings issuing from either side to denote his omnipresent energy. The winged solar disk may have been originally of Babylonian invention, but it passed at an early time to the other Semitic populations of the East. We find it above the figure of a king on a monolith from Birejik, now in the British Museum, and it is specially characteristic of the monuments of the Hittites. It is true that the same symbol is occasionally met with in Egypt;—Mr. Flinders Petrie has found it on a monument of the Fifth Dynasty, and it surmounts the inscription of a king of the Eleventh Dynasty which is preserved in the Boulaq Museum. But its rarity indicates that it was borrowed from abroad, and it is not until the epoch of the Hyksos invaders, and the age when the Asiatic wars of the Eighteenth Dynasty brought the Egyptians into contact with Syria and Mesopotamia, that we find it occupying a recognised place in Egyptian art. Like the religious ideas with which it was associated, it was an importation from Semitic Asia.

We now know that the mother of Amenophis IV. was of Asiatic birth. The conquests of Amenophis III., one of the greatest of the great monarchs of the Eighteenth Dynasty, had extended the empire of Egypt as far as the banks of the Euphrates. Here his dominions bordered on those of Tuisratta, called in the cuneiform tablets King of Mitana, a district which is described by Tiglath-pileser I. as lying on the eastern shore of the Euphrates, opposite the Hittite fortress of Carchemish.* The Egyptians called it the land of Nahrina or the "Rivers," and included under the designation the country westward of the Euphrates as far as the streamland of the Orontes. It is the *Aram Naharaim*, or "Syria of the two rivers," of Scripture, and it was from thence that Chushan-rish-athaim came to oppress Israel in the days of Othniel (Judges iii. 8–10). Chushan-rish-athaim must have been a successor of the grandfather of Amenophis IV.

For awhile after his father's death, Amenophis IV. conformed outwardly to the State religion of Egypt, or, at all events, made no endeavour to suppress or supersede it. But a time came when the smouldering hostility of the king and the powerful priesthood of Thebes burst into a flame. Amenophis found it difficult, if not impossible, to remain in

* In one of the cuneiform tablets at Boulaq the name of the district is written *Mitana-nanu*.

the capital of his fathers. Along with the other followers of the new creed, he left Thebes and built himself a new capital on the edge of the desert to the north. Here he assumed the name of Khu-en-Aten, "the glory of the solar disk," while his architects and sculptors consecrated a new and peculiar style of art to the new religion, and even the potters decorated the vases they modelled with new colours and patterns.

The archives of the empire were transferred from Thebes to the new residence of the king, and there stored in the royal palace, which stood among its gardens at the northern extremity of the city. But the existence and prosperity of Khu-en-Aten's capital were of short duration. When the king died, he left only daughters behind him, whose husbands assumed in succession the royal power. Their reigns lasted but a short time, and it is even possible that more than one of them had to share his power with another prince. At any rate, it was not long before rulers and people alike returned to the old paths. The faith which Khu-en-Aten had endeavoured to introduce was left without worshippers, the Asiatic strangers whom he and his father had promoted to high offices of State were driven from power, and the new capital was deserted, never to be inhabited again. The great temple of the Solar Disk fell into decay like the royal palace, and the archives of Khu-en-Aten were buried under the ruins of the chamber wherein they had been kept. Here they remained, concealed by the friendly sand, until the *fellahin*, searching for *sebâhh*, or nitrous earth, with which to manure their fields, at last brought them to light.

I happened to arrive at Cairo shortly after the discovery was made, and as no cuneiform scholar had as yet seen the tablets, I was of course very anxious to examine them. A few had already been secured by the Boulaq Museum; the rest of those which had been brought to Cairo had passed into private hands, and had been carried away elsewhere. Owing to an unfortunate misunderstanding, I failed to see the ones which were in the Museum, and it was not until a little before my departure from Egypt, in April, 1888, that M. Bouriant, the Director of the French Archæological School, obtained possession of about a dozen, which he kindly allowed me to copy. M. Bouriant's tablets were all, unfortunately, more or less injured, and I sought in them in vain for an indication of date. One of them, however, contained a reference to "the conquest of Amasis" (*Kasad Amasi*), and as Egyptian history knows of only two kings of that name,—the founder of the Eighteenth Dynasty, and the contemporary of Nebuchadnezzar,—I was bound to conclude that the latter was referred

to. We already knew that Egypt had been invaded by the great Chaldaean monarch; and, since the forms of the characters found upon the tablets belonged to the Babylonian and not to the Assyrian variety of cuneiform script, it appeared necessary to see in M. Bouriant's tablets relics of Nebuchadnezzar's Egyptian campaign. The Boulaq Museum already possessed three cylinders, which came from the neighbourhood of the Suez Canal, probably from Tel Defenneh or Tahpanhes, and bore the name and titles of Nebuchadnezzar.

One difficulty, however, stood in the way of ascribing the tablets of Tel el-Amarna to so late a date. On one of those belonging to M. Bouriant, the name of Gimti or Gath occurs, and it is pretty certain that Gath had ceased to exist before the sixth century B.C.

After my departure from Egypt, the question was finally cleared up. More than 160 tablets had been offered for sale at Vienna, and eventually bought by the Museum at Berlin. Here they were examined by two young Assyriologists, Drs. Winckler and Lehmann, who soon discovered that they consisted of letters and despatches sent to Amenophis III. and his son, Amenophis IV., thus explaining how it was that they had been disinterred at Tel el-Amarna. Another collection of 82 tablets was subsequently acquired by the British Museum, and, during the past winter, the courtesy of M. Grébaut and Dr. Brugsch-Bey has afforded me every facility for copying and examining the collection in the Boulaq Museum. This includes not only the tablets which I had failed to see the preceding spring, but others also which had been afterwards obtained by M. Grébaut.

My visit to Tel el-Amarna, last January, confirmed M. Grébaut's belief that no other tablets now remain there. The collection was found together in one place, which was pointed out to me, and the discoverers have been careful not to leave a fragment behind them. It is possible, however, that a few pieces may still be in the hands of native dealers; but, substantially, the whole body of tablets is now in European hands. We know, consequently, what they have to tell us.

And the tale is indeed a wonderful one. We learn that in the fifteenth century before our era,—a century before the Exodus—active literary intercourse was going on throughout the civilised world of Western Asia, between Babylonia and Egypt and the smaller states of Palestine, of Syria, of Mesopotamia, and even of Eastern Kappadokia. And this intercourse was carried on by means of the Babylonian language, and the complicated Babylonian script. It implies that, all over the civilised East, there were libraries and schools,

where the Babylonian language and literature were taught and learned. Babylonian, in fact, was as much the language of diplomacy and cultivated society as French has been in modern times, with the difference that, whereas it does not take long to learn to read French, the cuneiform syllabary required years of hard labour and attention before it could be acquired. We can now understand the meaning of the name of the Canaanitish city which stood near Hebron, and which seems to have been one of the most important of the towns of Southern Palestine. Kirjath-Sepher, or "Book-town," must have been the seat of a famous library, consisting mainly, if not altogether, as the Tel el-Amarna tablets inform us, of clay tablets inscribed with cuneiform characters. As the city also bore the name of Debir, or "Sanctuary," we may conclude that the tablets were stored in its chief temple, like the libraries of Assyria and Babylonia. It may be that they are still lying under the soil, awaiting the day when the spade of the excavator shall restore them to the light.

The literary influence of Babylonia in the age before the Israelitish conquest of Palestine explains the occurrence of the names of Babylonian deities among the inhabitants of the West. Moses died on the summit of Mount Nebo, which received its name from the Babylonian god of literature, to whom the great temple of Borsippa was dedicated; and Sinai itself, the mountain "of Sin," testifies to a worship of the Babylonian Moon-god, Sin, amid the solitudes of the desert. Moloch, or Malik, was a Babylonian divinity like Rimmon, the Air-god, after whom more than one locality in Palestine was named, and Anat, the wife of Anu the Sky-god, gave her name to the Palestinian Anah, as well as to Anathoth, the city of "the Anat-goddesses." The resemblances that have been observed between the cosmogonies of Babylonia and Phoenicia probably admit of a similar explanation. Here, too, the religious and philosophical ideas of the people of Canaan were moulded by their Babylonian instructors. Among the tablets from Tel el-Amarna, now in the Boulaq Museum, is a legend about Namtar, the Babylonian god of destiny and plague.

It was the southward march of the Hittites from the north, the destructive wars between them and Rameses II., which wasted Palestine with fire and sword, and, finally, the Israelitish conquest of Canaan, which appear to have put an end to the old literary intercourse among the populations of Western Asia, and to have caused the Babylonian language and script to be disused and forgotten. The Hittites forced themselves like a wedge between the Semites of the East and of the West,

while the Israelites destroyed the cities and culture of the Canaanites, already exhausted, as they were, by the Hittite invasion and the campaigns of the Egyptian Pharaoh. We know from the Old Testament that Kirjath-Sepher, with its library, was one of the cities smitten by Othniel, never to rise again (Joshua xv.; Judges i.). A knowledge of cuneiform writing ceased to extend westward of the Euphrates, and for a while the inhabitants of Syria had to be content with the hieroglyphs of the Hittites. But it was not long before the practical traders of Phœnicia devised a better means of recording their thoughts or registering their cargoes than the cumbrous pictorial forms which the mountaineers of the Taurus had brought with them. The characters of the Egyptian alphabet were borrowed in their hieratic form, and adapted to the needs of the borrowers. In the tenth century before our era, the Phœnician alphabet comes before us already fully formed.

Among the Tel el-Amarna tablets now in Berlin and London are some from the Babylonian king Burna-buryas, the son of Kuri-galzu, who reigned about 1430 B.C. But the larger part of them are written by persons who were in no way connected with Babylonia, and to whom therefore Babylonian was a foreign language. A considerable number are despatches from Egyptian officers in Palestine and Syria, many of whom bear Semitic names. They throw a curious and unexpected light on the inner history of the country in the age when "the Canaanite was still in the land."

In the present paper, however, I intend to confine myself to the tablets belonging to M. Bouriant and to the Boulaq Museum which I have myself examined and copied. They include some of the most important contained in the whole collection.

Those relating to Palestine first claim our attention. They bear out the evidence of the Egyptian monuments, and indicate that the cities of Palestine acknowledged the suzerainty of the Egyptian sovereign. The affairs of Phœnicia were directed by an Egyptian governor, who bears the Semitic name of Rib-Addu or Rib-Hadad, and who was assisted by Yapa-Addu and Aziru.* Several of his despatches relate to the city of Tsumura or Simyra, the Zemar of Gen. x. 18, which he describes in one of them as "very strongly situated, like a bird whose nest is built on a precipice." At the end

* The name of Rib-Addu may also be read Rip-Dadu. Yapa-Addu, or Dadu, is probably "Hadad is beautiful" (from יפה); and Aziru seems to be the Biblical אַצִּיר.

of the same despatch reference is made to "the King of Mitana," or Aram Naharaim, "the King of Tarkusi, and the King of the Hittites," as well as to a certain "Yankhan, the servant of the King of Yarimuta"; but the tablet is too much injured to enable us to say whether the relations of the Egyptian official to these personages were friendly or otherwise. Another letter from the same official mentions that two ships belonged to him, and adds that certain animals had been brought to him by Yapa-Addu. In a third tablet the city of Sidon seems to be named, while the tablets at Berlin speak of Tyre, Acre, and Megiddo.

The territory of the Philistines, commanding as it did the northern end of the road from Egypt into Palestine, naturally occupied the attention of the Egyptians a good deal. One of the tablets belonging to M. Bouriant, though broken at the end, is very interesting in this respect. It runs thus: "To the king my lord, speak thus: Thy servant Aruki (or Arudi) says: (at the feet of the king) seven times seven do I prostrate myself. . . . When a raid was made, Milki (Melech) of the sea-coast (marched) against the country of the king my lord, commanding the forces of the city of Gedor (*Gaturri*), the forces of the city of Gath (*Gimti*), and the forces of the city of Keilah (*Kilti*). They seized the country of the city of Rabbah (*Rubute*) dependent on the country of the king, belonging to the 'Confederates' (*khabiri*). And again he destroyed entirely the city of the land of Urursi, the city of the god Uras, whose name (there) is Marru (Marnas), the city of the king, dependent on the locality of the men of Keilah, and twelve cities of my king." Two small tablets in the Boulaq Museum, both unfortunately broken in half, give us further information about the affairs of Southern Palestine. One of them may be translated as follows: "To the king my lord, my gods, my Sun-god, by letter I speak, even Su-arda-ka, thy servant, the dust of thy feet. At the feet of the king my lord, my gods, my Sun-god, seven times seven do I prostrate myself. The king of . . . set himself to make war. In the city of Keilah (*Kelti*) he made war against thee for the third time; a complaint was brought to myself. My city that belongs to me adhered (?) to me. Ehed-tob sent to the men of Keilah. He sent fourteen pieces of silver, and they marched against my rear, and they overran the domains of the king my lord. Keilah, my city, did Ehed-dhabba remove from my jurisdiction. The pleasure-park (?) of the king my lord, and the fortress of Baal-nathan, and the fortress of Hamor (the Amorite) he removed from his presence and his justice. Lab-api, the halting in speech, occu-

pied the fortress of . . . ninu, and when Lab-api, along with Ebed-dhabba and [his companions] occupied the fortress of . . . ninu, the king [sent] to his servant."

Lab-api is mentioned again in the other tablet to which I have referred. What remains of it runs thus: "And, again, the city of Pir(qar), the fortress which is in front of this country, belonging to the king, I made faithful. At that time the city of Gaza (*Khazati*), belonging to the king, which is on the shore of the sea, westward of the country of the cities of Gath and Carmel(?), * fell away to Urgi and the men of Gath. I rode in my chariot (?) for the second time, and we marched up (out of Egypt). Lab-api and the country which thou possessest [went over] for the second time to the men of Hebron, the Confederates (*khabiri*) of Milki-ar'il, and he took (their) sons as hostages (?). At the same time he uttered their requests to the men of the district of Kirjath (*Qarti*), and we defended the city of Ururusi. The men of the garrison whom thou hadst left in it were collected by Khapi (Apis), my messenger. Addasi-rakan in his house in the city of Gaza [sent messengers] to the land of Egypt."

The use of the word *khabiri*, which occurs here and in the first text I have translated, seems to show that we must render it by "Hebronites" rather than as the common noun "confederates." The word may throw light on the origin of the city of Hebron, which grew up out of a confederacy of tribes worshipping at a common sanctuary, and may explain why the name is not met with on the Egyptian monuments. Kirjath is, perhaps, Kirjath-Sepher, though it may also denote Kirjath-Arba, the old name of Hebron. As for Milki-ar'il, it is formed like Melchizedek or Malchiel, and must be interpreted "Moloch is Ar'il." Ar'il, the Ariel of Isai. xxix. 1, and the "lion-like men" of the A. V. in 2 Sam. xxiii. 20, has been shown by a passage in an Egyptian papyrus to mean "hero," so that when King Mesha declares on the Moabite Stone that he carried away the אַרְלִיּוֹם of יהוה and הִרְוּה, we must understand that he carried away the consecrated "heroes" who protected the Israelitish shrines of Yahveh and Dodah.

Dodah is the same name as that which we find in the varying forms of Dodo, Dod, and David, and up to now it has not been found outside the pages of the Old Testament, though the feminine Dido proves that it was known to the Phœnicians; and the Assyrian Dadu, corresponding to the Syrian Hadad, comes from the same root. But one of the

* It is doubtful whether we are to read Irmila or Kirmila.

Tel el-Amarna tablets in the Boulaq Museum now informs us that Dûdu or David was a name employed among the Semites long before the age of the founder of the Empire of Israel, or even of the Exodus. The tablet is a letter addressed by Aziru to his "lord" and "father" Dûdu. We have already made the acquaintance of Aziru, who was one of the lieutenants of Rib-Addu in Phœnicia; and it is possible that the letter to his father was written from that part of the world. The middle of the tablet is injured; what is left of it runs as follows: "To Dûdu, my lord (and) father, I speak, even Aziru, thy son, thy servant; at the feet of my father I prostrate myself; unto the feet of my father may there be peace! O Dûdu, now . . . the foundations of the palace of my lord have been laid, and I have founded (them) for a temple. . . . And now, O Dûdu, my father, plant the gardens, and I will look after the daughter (of the king). [Behold], O my father and my lord, I will look after the girl. . . . I have directed the planting (of the gardens), and have planted the trees. . . . I am the servant of the king my lord [who comes] from executing the commands of the king my lord [and] the commands of Dûdu my father; (everything) do I observe until his return home . . . he has sent a soldier, and let me come unto thee."

It is clear from the letter that Dûdu, or David, occupied a high position in the court of the Pharaoh, and, like his son, appears to have been employed in laying out the gardens attached to the palace of the Egyptian king. It is even possible that he may have been a Hebrew; at all events, the name has never yet been found in a Phœnician inscription, while we know that it was borne by Israelites. Aziru, too, is probably the Biblical Ezer.

Phœnicia seems to have been the furthest point to the north to which the direct government of Egypt extended. At any rate, the letters which came to the Egyptian monarch from Syria and Mesopotamia were sent to him by princes who called themselves his "brothers," and not by officials who were the "servants" of the king. Doubtless, many of these princes were but semi-independent, and in case of war were required to assist the Egyptian Government. One of those in most frequent correspondence with the Pharaoh was the King of Alasiya, a country which lay to the east of Arvad, in the district afterwards occupied by Homs and Hamath, though it also seems to have possessed a port on the sea-coast. The name of the country has been read "Aroscha" and "Arsa" by Egyptologists; but the cuneiform texts now furnish us with its true pronunciation. A very perfectly-preserved

tablet at Boulaq, containing a letter from the King of Alasiya, has a docket attached to it in Egyptian hieratic characters, which reads: "The correspondence of the prince of the country of Alasha." The letter is as follows: "To the king of Mitsri (Egypt), my lord, I speak by letter, I, the king of the country of Alasiya, thy brother. I am at peace, and unto thee may there be peace! To thy house, thy daughters, thy son,* thy wives, thy multitudinous chariots, thy horses, and in thy land of Mitsri may there be peace! O my brother, my ambassador has carefully conveyed a costly gift for them, and has listened to thy salutation. This man is my minister, O my brother. Carefully has he conveyed to them the costly gift. My minister has not brought my ship along with them." There is another letter in the Boulaq Museum which is clearly from the King of Alasiya, though the commencement of it is lost. Here we find: "Now I have sent [thee] as presents a sea (?) of bronze, three talents of hard bronze, the tusk of an elephant, a throne, and the hull (?) of a ship. These gifts, O my brother, this man [brings in] this ship of the king [my lord], and do thou in return send a costly gift to me carefully. [And] do thou, O my brother, [listen to] my request, and give to me the . . . which I have asked for. This man is the servant of the king [my] lord, but the carpenter with me has not finished (his work) in addition to the other presents; yet do thou, O brother, send the costly gift carefully."

The reference to the *sinnu sa biri*, or "elephant's tusk," is interesting. We know, from the Egyptian inscriptions, that Thothmes III. hunted wild elephants in the neighbourhood of Ni, near Aleppo; while, some four or five centuries later, Tiglath-pileser I. did the same in the neighbourhood of Carchemish.

The King of Alasiya was not the only foreign potentate whose letters are preserved in the Museum of Boulaq. One of the tablets in the collection begins in this way: "[To N]imutriya, the King of Egypt, [I speak] by letter, even I, [Ris-takul]la-Sin, the king of the country of Babylonia. My peace be [upon thee], and upon thy wife, thy children, [thy house], and thy chariots and horses; upon all thy [possessions] may there ever be peace!" The letter then goes on to state that the father of the writer had sent his daughter, Irtabi, to the Egyptian Pharaoh many years before, Nimutriya sending presents in return to his father. After his accession to the throne, the Babylonian prince "again sent

* Perhaps we may infer, from the mention of the Pharaoh's son, that the letter was addressed to Amenophis III., and not to Amenophis IV.

an ambassador" to Egypt; and, six years later, the Pharaoh forwarded by his envoy Salmási, thirty manehs of gold, besides a certain amount of silver. The object of the letter is to inform the Egyptian monarch that other presents are now on their way from his brother-in-law.

Babylonia is here called Kara-Duniyas, the name by which it went in the age of the Kassite Dynasty. Another potentate who corresponded with the Egyptian kings ruled over a country the name of which is unfortunately lost, a fracture of the tablet having destroyed the characters which composed the name. The letter commences with the words: "[I am] Subbi-kuzki, the king of the country of . . . ma(?)-ti; to Khûrî[ya], the [king of] Egypt, [I speak] by letter. [May] there be peace before thee, may there be peace [unto thy wife], thy children, thy house, thy soldiers, [thy] chariots, [and in] the midst of thy country may there ever be peace: O my brother, my ambassador whom I sent to thy father, and the request which thy father made to the king, saying: 'O prince, let us take counsel together,' I did not countermand." The royal scribe then inquires why no acknowledgment has been made of the presents he has sent to Egypt, and adds that he is forwarding various other gifts, including a cup of silver five manehs in weight, and a second cup of silver three manehs in weight, as well as two other objects of silver ten manehs in weight.

The most interesting, however, of all the tablets at Boulaq is a long and well-preserved one, which is addressed by Tarkhundaras, king of the country of Arzapi, to Nimutriya, or Amenophis III., the Pharaoh of Egypt. The heading and one or two technical words are in Semitic Assyrian, but the rest of the letter is written in an unknown language. The ideographs employed in it show that the introductory greetings are the same as those found in other letters from foreign potentates to the Egyptian king, and we are thus enabled to determine the meaning of the phonetically-written words which occur in them. Thus the possessive pronoun "my" is expressed by the affix *mi*, and the pronoun "thy" by *ti*, *tim*, and perhaps *ta*, which become *tu* when suffixed to the word signifying "trees." These two pronouns offer a strange similarity to the corresponding pronouns in the Indo-European languages. *Bibbi* is "chariot," and *bibbid* "chariots," while *kalatta* seems to mean "brother." *Ganeda* is "exceedingly," and *khuman-sakh(?)*-in "may there be peace;" *sakh(?)*-an-ta being "thy peace-offering," and *khalu-garitsi* "a messenger." Now, Tarkhundaras is a Hittite name, like the names of Tarkhu-nazi and Tarkhu-lara found on the Assyrian monuments,

or the name of Tarkondêmos on the now famous bilingual boss ; and the name of the country over which he ruled reminds us of Rezeph (2 Kings xix. 12), in North-western Mesopotamia. I am, therefore, tempted to see in the language of the letter one of the Hittite dialects which are concealed under the hieroglyphs of the Hittite texts. The purport of the letter is to describe the various presents sent by Tarkhundaras to the Pharaoh by the messenger, Irsappa, in return for the hand of the Pharaoh's daughter, who had been given to him as a wife. Among the presents sent were 20 manehs of gold and 100 shekels of lead. Mention is made in the letter of "the prince of the Hittites" (*Khatte*), who, it would appear, lived in the mountains of I-gaid.*

The Hittites are alluded to in other tablets at Boulaq. I have already spoken of the despatch of Rib-Addu, in which reference is made to the kings of Tarkusi and the Hittites, as well as to the adjoining kingdom of Mitanna or Naharaim. Another tablet of black clay, unfortunately much worn and injured, tells us that "at that time the king of the Hittites was captured in the vicinity of the country of Kutiti (and) the kings of Mittanni and Nabuma" joined in the war. A despatch now at Berlin contains an urgent request from one of the cities of Syria for help against the Hittites, whose forces were advancing southwards.

One of the facts which result most clearly from a study of the tablets is that, not only was a Semitic language the medium of literary intercourse between the Pharaoh of Egypt and his officers abroad, but that Semites held high and responsible posts in the Egyptian Court itself. Thus we find Dudu, or David, addressed by his son as "my lord," and ranking, apparently, next to the monarch ; and there are letters in the Boulaq Collection written not only by officials with an Egyptian name, like Khapi or Hapi (Apis), but with such Semitic names as Rib-Addu, Samu-Addu ("Shem is Hadad") of "the city of Samkhuna," Dasru, Bu-Dadu (the Biblical Bedad), and Milkili (the Biblical Malchiel). Even the Assyrian Su-arda-ka occurs in one of them. A flood of light is thus poured upon a period of Egyptian history which is of high interest for the student of the Old Testament. In spite of the reticence of the Egyptian monuments, we can now see what was the meaning of the attempt of Amenophis IV. to supersede the ancestral religion of Egypt. The king was in all respects an Asiatic.

* According to the "Travels of the Mohar" (Brugsch's translation), the land of Igad'ai bordered on the country of the Hittites to the north of Aleppo.

His mother, who seems to have been a woman of strong character,—able to govern not only her son, but even her less pliable husband,—came from the region of the Euphrates, and brought with her Asiatic followers, Asiatic ideas, and an Asiatic form of faith. The Court became Semitised. The favourites and officials of the Pharaoh, his officers in the field, his correspondents abroad, bore names which showed them to be of Canaanite and even of Israelitish origin. If Joseph and his brethren had found favour among the Hyksos princes of an earlier day, their descendants were likely to find equal favour at the Court of “the heretic king.”

We need not wonder, therefore, if Amenophis IV. found himself compelled to quit Thebes. The old aristocracy might have condoned his religious heresy,—they could not condone his supplanting them with foreign favourites. The rise of the 19th Dynasty marks the successful reaction of the native Egyptian against the predominance of the Semite in the closing days of the 18th Dynasty. It was not the founder of the 18th Dynasty, but the founder of the 19th Dynasty that was “the new king who knew not Joseph.” Ever since the progress of Egyptology had made it clear that Rameses II. was the Pharaoh of the oppression, it was difficult to understand how so long an interval of time as the whole period of the 18th Dynasty could lie between him and that “new king” whose rise seems to have been followed almost immediately by the servitude and oppression of the Hebrews. The tablets of Tel el-Amarna now show that the difficulty does not exist. Up to the death of Khu-en-Aten, the Semite had greater influence than the native in the land of Mizraim.

The legend under which Manetho veiled the history of the Exodus now also receives its explanation.* Amenophis, the son of Rameses, we are told, desired to see the gods, like his predecessor, Oros, and accordingly, by the advice of the wise man Amenophis, the son of Paapis, he removed all the leprous people in Egypt, 80,000 in number, to the quarries on the east bank of the Nile. Among them was a priest of Heliopolis, Osarsiph, in whose name the sacred first syllable of *Joseph* has been replaced by the name of the Egyptian god Osiris. After a time, Amenophis retired to Ethiopia, the leprous people, who had meanwhile been transferred to the deserted city of Avaris, having revolted with the assistance of the descendants of the Hyksos, now settled in Jerusalem. For 13 years, Egypt was wasted by them with fire and sword, its temples plundered, and the images of the gods destroyed;

* Josephus, cont. Ap. i. 26-35.

and it was not until the end of that fatal period, that Amenophis returned from Ethiopia with his son Sethos, and expelled the enemy under their leader Osarsiph, who had assumed the name of Moses. Sethos is plainly Seti II., Rameses being Rameses II., and Amenophis his son Meneptah, in whose reign, as we now know, the Exodus must have taken place. Oros, whose conduct Amenophis desired to imitate, was a king of the 18th Dynasty, and takes the place of Khu-en-Aten in the list of Manetho. In the tablets of Tel el-Amarna, Khu-en-Aten is usually called Nimkhururiya, corresponding to the prænomen hitherto read by Egyptologists, Nofer-kheperu-Ra; but, as we have seen, Subbi-kuzbi, in the letter mentioned above, gives him the abbreviated title of Khūriya, which is exactly the Oros of Manetho. It would appear, then, that the Egyptian legend has mixed together Amenophis IV., under whom the Semites and their religion became predominant in Egypt, with Meneptah, the Pharaoh of the Exodus. As Professor Erman has pointed out, Amenophis, the son of Pa-Apis, must be Amen-hotep, the son of Hapi, who erected the colossus of Memnon at Thebes during the reign of Amenophis III.

So far as the date of the Exodus is concerned, the newly-found tablets confirm the conclusions already arrived at by Egyptology, and so brilliantly verified by M. Naville's discovery of the site of Pithom. At the close of the 18th Dynasty, Palestine was still Canaanite; the Israelitish invasion had not as yet taken place, and the only foreign dominion acknowledged by its cities was that of Egypt. Between Canaan and Egypt, indeed, there was close and constant intercourse. The towns of Palestine were garrisoned by Egyptian troops, and, though its governors bore Semitic names, they were officials of the Egyptian king. Egyptian influence and supremacy extended through Syria as far as the banks of the Euphrates; the Hittite conquests in the north and the Israelitish conquests in the south had not as yet driven Egypt back into Africa, and separated the eastern and western portions of the educated world one from the other.

How highly educated this old world was we are but just beginning to learn. But we have already learnt enough to discover how important a bearing it has on the criticism of the Old Testament. It has long been tacitly assumed by the critical school that writing was not only a rare art in Palestine before the age of David, but was practically unknown. Little historical credence can be placed, it has been urged, in the earlier records of the Hebrew people, because they could not have been committed to writing until a period when the

history of the past had become traditional and mythical. But this assumption can no longer be maintained. Long before the Exodus, Canaan had its libraries and its scribes, its schools and literary men. The annals of the country, it is true, were not inscribed in the letters of the Phœnician alphabet on perishable papyrus; the writing-material was the imperishable clay,—the characters those of the cuneiform syllabary. A new light is thus thrown on royal lists like that contained in Genesis xxxvi. Why should this not be an extract from the chronicles of Edom originally written in the cuneiform syllabary of Babylonia? A connection with Babylonia is indicated by the statement that Saul came from “Rehoboth” or “the city-streets by the river” Euphrates, more especially when it is remembered that Saul, or Sawul, is the Babylonian name of the Sun-god. Though Kirjath-Sepher was destroyed by the Israelites, other cities mentioned in the Tel el-Amarna tablets, like Gaza, or Gath, or Tyre, remained independent, and we cannot imagine that the old traditions of culture and writing were forgotten in any of them. In what is asserted by the critical school to be the oldest relic of Hebrew literature,—the Song of Deborah,—reference is made to the scribes of Zebulon “that handle the pen of the writer” (Judges v. 14), and we have now no longer any reason to interpret the words in a non-natural sense, and transform the scribe into a military commander. Only it is probable that the scribes still made use of the cuneiform syllabary, and not yet of the Phœnician alphabet.

In the hands of writers like Stade, criticism has reached the extreme point of scepticism; and, just as in early Greek history, the discoveries of Schliemann and others have obliged us to re-consider the negative judgments of twenty years ago, and to admit a substratum of truth in the old traditions, so, too, we may confidently hope that archæological discovery will, before long, enable us to reconstruct that history of Israel of which modern criticism would fain deprive us. At all events, the Tel el-Amarna tablets have overthrown the primary foundation on which much of this criticism was built, and have proved that the populations of Palestine among whom the Israelites settled, and whose culture they inherited, were as literary as the inhabitants of Egypt or Babylonia. If we are to doubt the statement that Othniel, the Kenizzite, took the city of Kirjath-Sepher and defeated the forces of the king of Aram-Naharaim, it must be for some better reason than the literary ignorance of the Hebrews and the neighbouring tribes.

It is impossible for me now to touch upon the many other

points in which the tablets of Tel el-Amarna have come to the aid of the student of ancient history. Thus light is thrown upon the pronunciation of ancient Egyptian by such spellings as Nimutriya and Nimmuriya for the prænomen of Amenophis III., hitherto read Ra-mât-neb and Ra-mâ-neb; and the etymology I proposed for the name of Moses, in my Hibbert Lectures,* has received a striking verification. I had there pointed out that the name is the exact equivalent of the Babylonian word, *Masu*, "a hero," an epithet which I tried to show was applied to the Sun-god. Within a year after the publication of my Lectures, one of M. Bouriant's tablets showed that my conclusions were right. In a despatch from Zinarpi to the Egyptian king, the Pharaoh is called, as usual, "the Sun-god rising from the Divine Day"; and it is then added, in a parenthesis, "whose name is Masu." This proves not only that the term "Masu" was applied to the Sun-god, but was actually used of the Egyptian Pharaoh in the century before Moses was born. It may be that later ages confounded the Semitic "Masu" with the Egyptian *mesu*, "a son," and the Hebrew "Mosheh," or Moses, with "Mes," "the Prince of Kush," in the reign of Rameses II., thus originating the legend, recorded by Josephus, of the campaign of Moses in Ethiopia; but it is impossible to believe that the great law-giver of the Hebrew nation could have continued to bear through life an Egyptian name.

But, apart from such side-lights as these upon ancient history,—apart also from the more important facts which have already resulted from an examination of the texts,—the discovery of the tablets of Tel el-Amarna has a lesson for us of momentous interest. The collection cannot be the only one of its kind. Elsewhere in Palestine and Syria, as well as in Egypt, similar collections must still be lying under the soil. Burnt clay is not injured by rain and moisture, and even the climate of Palestine will have preserved uninjured its libraries of clay. Such libraries must still be awaiting the spade of the excavator on the sites of places like Gaza or Kirjath-Sepher, or others whose remains are buried under the lofty mounds of Southern Judæa. Why should Palestine, the sacred land of our faith, remain unexcavated, while all over the rest of the ancient Oriental world the disinterrers of the past have been vieing with one another with feverish activity? Why should workmen and funds be found for exhuming the buried history of early Greece, while the religious public is content with surveying the surface of the soil of Palestine?

* *On the Religion of the Ancient Babylonians.*

There is not much to be discovered on that surface which has survived the wreck of centuries ; it is only within the kindly bosom of the earth that we shall find, hidden and preserved, the precious relics of the past. The tablets of Tel el-Amarna are an earnest that they will yet be found, if they are properly searched for ; and that our children, if not ourselves, will yet know how the people of Canaan lived in the days of the Patriarchs, and how their Hebrew conquerors established themselves among them in the days when, as yet, "there was no king in Israel."

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VOL. XXI.—1887-8.

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BY

THE REV. HENRY GEORGE TOMKINS.

WITH NOTES BY PROFESSOR MASPERO AND OTHERS.

*BEING A PAPER READ BEFORE THE VICTORIA INSTITUTE, OR
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THOSE who know the kind of interest which Mr. George Grove has described as springing from the study of Biblical names, will lend a willing ear to anything that will help toward the cultivation of so fruitful a field.*

More to stimulate than to satisfy such interest I venture to lay before you some inquiries into the bearing of late researches on this matter.

In 1865 a very useful work was published by the Rev. W. F. Wilkinson on *Personal Names in the Bible*.†

I recommend this little book to the attention of students ;

* "*P.E.F.*," 1880, 197.

† Strahan.

but its perusal will show how much ground has been gained within the last sixteen years. This will easily appear by collating the work with the index of Bible names given by the Rev. T. K. Cheyne in the *Variorum Teachers' Bible* of Messrs. Spottiswoode (1880), and there is still much to be done in explaining the origin and affinities of Biblical Proper Names.

All kind forbearance I must crave, for the subject is immense and most difficult, and while I have been turning it over, new lines have been struck out, as, for instance, by Professor Robertson Smith in his paper on *Animal Worship and Animal Tribes among the Arabs and in the Old Testament*;* and important material has been contributed by M. Lenormant in his work *Les Origines de l'Histoire* and by Dr. Friedrich Delitzsch in his essay on the *Site of Paradise*,† which contains a profusion of geographical knowledge far beyond the limits suggested by the title. M. Derenbourg has also compared the proper names of persons in the Old Testament with those of Himyaritic inscriptions, in an interesting article in the new *Revue des études Juives*.

But for a rash promise I should have shrunk from this difficult topic altogether; but I hope to show how in various directions the names of the Bible agree with the assumed conditions of the holy writings, and may help us in further fruitful studies to the glory of that "Name which is above every name."

Names Personal and Local.

Personal and local names are vitally connected. Men of old loved to "call their lands after their own names," and were called after their native land, and the man gave name to his race, which is included in a vivid way in the personal name and the territorial. So it is often hard to know whether we are reading of men, or tribes, or cities and regions, for all have their pedigrees, and the fashion of recording them was often similar or the same.

M. Clermont Ganneau‡ has noticed, for instance, that the modern name of the Belka is the same as that of Balak, king of Moab (compare Belkis, queen of Sheba, H.G.T.); that Shihân, where M. de Vogüé found a magnificent bas-relief of a king, is the same word as Sihon, king of the Amorites; the

* *Journ. of Philology*, ix. 75.

† *Wo lag das Paradies?* Leipzig, 1881

‡ *P.E.F.* 1881, 12.

Aujeh, an affluent of the Jordan, as Og, king of Bashan; Ajlûn as Eglon, king of Moab, &c.

And if personal and ethnic names have been thus sown in the earth, no less have attributes of Godhead grown into titles of renown, and clad heroes of old with mantles from the skies, so that *numina nomina* is as true as the converse *nomina numina*.

If Laban, and Makhir, and Gad, and Adrammelek were names of gods, they were borne by men of the Old Testament as naturally as the names Hermes, Nereus, and Phœbe, by men and women of the New Testament. Erroneous inferences have been drawn from this, the extreme use of divine names: the subordinate use in compound names is very interesting.

As in former papers, I must avoid the more accustomed lore, and take up a selection of typical instances, for the most part, perhaps, unfamiliar to the student of the Bible.

With regard to local names within the Holy Land, the great survey of Western Palestine, with its accompanying books, quarterly statements, and memoirs, has given us an almost endless amount of information, on which I shall draw very little in this paper. The survey of Eastern Palestine, now in progress under Lieut. Conder, R.E., will not be an unworthy supplement to the former.

Names containing Divine Titles.

A large proportion of names personal and local were built with the name or title of some god. Both in and out of the Bible these words abound. For instance, Ab (father), Akh (brother), Am (in the sense of kinsman), are constantly joined to the names of gods, and I think generally used as a predicate:—Abiah, for instance, “A father is Yah.”

After all that has been said of the name Abram, may it not be classed with Abi-ram, Akhi-ram, Adoni-ram, and Malkhi-ram, and Am-ram, and explained by the name of the god Ramu* (𐤓𐤌𐤕 𐤔𐤏𐤓𐤕)? Hesychius gives *Ραμας, ὁ ὑψιστος θεός*. Thus we have an Ab-ramu in the reign of Esar-haddon,† and an Akhi-ramu (a Syrian) in the Annals of Assurbanipal, and a Ba'al-ram in a bilingual Phœnician and Cypriote inscription.‡ We know that in Chaldea Abram's fathers “served other gods,” and if indeed his original name was of this class, then a divinely-given change of name would be the

* *T.S.B.A.*, vii. 90.

† *Ep. Canon* 69, *Rec.* iii. 52.

‡ *T.S.B.A.*, i. 155.

more naturally explained. The new name Ab-raham, generally interpreted as "father of a multitude" is elucidated by Harkavy in the light of the Assyrian *rahimu*, loving, as "loving father." Compare with this in *sense*, Isaiah, xli. 8. "Abraham that loved me," although the verb is different. I do not say that Harkavy is right.

Very many names of this class are obvious enough, as Akhi-yah, Abi-yah, Ammi-el, Ammi-shaddai, but in many cases we have not yet traced with certainty the latter element.

Akhi-man was one of the "three sons of Anak"* whom Caleb drove out from Hebron. Is the *man* in this name "Manu the Great" of the Babylonians, the god of fate?†

In the group of names ending in "hūd" (Abihud, Akhihud, Ammihud, Ishhud) is this the Hūd of the Egyptians, the solar winged disk, or may it be the Akkadian sungod Ud, or are both identical?

Akhi-mōth seems to involve the name of the Phœnician Pluto, Mōth.‡ The local names Hazar-maveth or Hazar-mōth, and Az-maveth or Beth-azmaveth, are parallel.

In Abi-melek, Akhi-melek I think we have a similar case, the name of the god Melek or Molek being compounded; which is, of course, rather an epithet, like Ba'al, than a name.

In Abi-no'am and Akhi-no'am a title of Tammuz may be found, as Mr. Cheyne has so well pointed out in the Syrian Na'aman. §

In Assyrian annals we have Akhi-melek, Abi-melek, Akhi-tōb, and the like.

I think Tōb must be distinctly a divine title. It is, however, obvious that it was a gradual growth that gave such epithets as "good," "high," "just," the force of a separate divine personality; and they were challenged for their rightful owner in such names as Tob-adoni-Yah, just as another familiar heathen title in Ba'alyah "the master is Jehovah," or Yobel. || How curious is the name of a son of David (whose mother was one of the wives whom he took in Jerusalem) Ba'alyāda, elsewhere called El-yāda ("Ba'al knoweth," "God knoweth.")

Even Zedek in Adoni-zedek and Melki-zedek may be the god of the Phœnicians. Melkizedek may have had a heathen or half-heathen name given to him by such parents as Abram

* Josh., xv. 13.

† Lenormant, *Les Origines*, 546.

|| Judges, ix. 26; lxx.

+ *Chald. Magic*, 130, 133.

§ Isaiah, i. 104.

had, and yet have retained, or revived, as pure a worship of the Most High God as Abram offered. The name of Ba'al-zebul, lord of the height, like Ba'al-ram, is a most fit title for the Most High God, but these and other sublime names were debased to hell by the "many inventions" of pantheism, and polytheism, and what has been called by Professor Max Müller "henotheism." Names compounded with Töb, Zedek, and the like, remind us of Mr. Budge's remark that there were temples erected in Babylonia to abstract qualities,* which are mentioned in fragments of cylinders of Nebuchadnezzar. Zidqa is the name of a king of Sidon in the records of Sennakherib.

Other names are derived from those of gods with an addition of *i*, as in patronymic or gentilic names; as Barzillai from Barzil a title of Ninip an Assyrian god. Under this head I think Sheshai and Talmai, two of the "sons of Anak," come. The former seems connected with Sheshan, and Shesh-bazzar, the numeral *shesh* (six) lying at the root, as a symbol of a god. It symbolized the god Bin or Ramanu. Ba'al Shalisha indicates *three*. I have elsewhere traced "Arba" (four) in connexion with Kiriath-Arba' and other places.†

Sheba (seven) appears in Bath-sheba and other names, and may be connected with the god Sbat, and the Seb of the Egyptians. And Eshmün, (eight) the eighth of the Kabirim, is well-known. But these remarks on numerical symbols are parenthetical and illustrative of Sheshai.

In like manner Besai seems clearly to indicate the god Bes, or Besa, of Arabian origin, of whom the Egyptians were so fond, his deformed visage being associated with articles of the toilet.

Brugsch has very naturally connected with him the feminine Beset (or Bast) whose name appears in Pi-beseth (Bubastis) in Lower Egypt.

I have often thought that the familiar play on the word bōsheth (which in the Hebrew means "shame") in connexion with Ba'al-worship may have some allusion to this goddess of eastern origin.

Sippai (or Sapi), ספי, and Saph or Sap, ספ, equally recal Sap, the god of the Eastern borders of Egypt. And Bebai seems clearly enough derived from Beh, a Typhonic name well-

* *Ch. Sunday Sch. Mag.*, 1880, 244.

† *Trans. Vict. Inst.*, 1877 : *Studies on the Times of Abraham*.

known in Egypt and Sinaïtic Arabia, as I have already suggested elsewhere.*

Hori, Horaï, Huraï, are perhaps derived from the Egyptian god Horus, and Hur is supposed to be included in the same category.

Hori (like Seti, Ameni, and other names familiar enough), is a pure Egyptian name. So is Hora (הֹרָא), and Harnefer is found in Egyptian inscriptions, meaning "the good Horus." †

Maharaï, מַהֲרַי, the name of one of David's valiant men, is very interesting. It is derived from *Mohar*, a Semitic word for a hero or champion which was introduced into Egypt about the time of Rameses II. Compare the Carthaginian Mahar-bal.

Aziza is a curious name with which we compare the Nabathæan god Aziz, and the well-known Abdul-Aziz of these days. ‡

From Egypt we gain much in the explanation of Biblical names. Puti-p-ra and Puti-p-har (which involves the name of Horus, not of Ra) are well-known.§ To these we add Puti-el, a compound of Egyptian and Semitic exactly paralleled by the Pet-Ba'al mentioned by Brugsch. Puti-el was the name of the man (Egyptian?) whose daughter was the wife of Eleazar, son of Aaron, and mother of Pinehas. This name, Pi-nehas, Brugsch claims as Egyptian|| (from Nahasi, the negro; perhaps he inherited a dark complexion from Puti-el.) Lui (Levi) was the name of a high-priest of Amen under Menephtah, and therefore probably contemporary with Moses.

May not Miriam be one of the many Egyptian names beginning with Meri? Râmeses II. bore the well-known title of Meriamen, and so did one of his daughters, while the princess Merris¶ (Meri, one of the younger daughters of Râmeses) is said to have been the protector of Moses. Now Miriam is called by Josephus Mariamne, and the same form of the name became famous in the Herodian house. Does not this make it probable that Meriamen was the original name, perhaps shortened from aversion to the full Egyptian form? The same name Mariamne or Mariamme belonged to a place in Syria, west of Emesa, and in this case it seems

* *Trans. Vict. Inst.*, xv. 90.

† *Deveria Cat. MSS.*, 66.

‡ *Ezra*, x. 27.; *Pierret, Petit Man.* 100.

§ *Trans. Vict. Inst.*, xv. 91.; *Ex.* vi. 25.

|| Brugsch, *Hist.* ii., 130.

¶ *Euseb., Præp. Ev.*, ix. 27.; Brugsch. *Hist.*, ii. 112.

likely enough that the name was that of Râmeses Meriamen, who founded (or refortified) a strong post in that part of Syria under his own name.

The Egyptian women Shiprah and Puah bore names which have been explained in accordance with hieroglyphic names in inscriptions.*

That the Israelites should have among them a number of Egyptian names is also to be expected from their long continuance in the land first of their refuge and prosperity and then of their bondage, and I think they will be found on careful search.

Amon is purely Egyptian, the familiar name of the great God. Asir is probably to be taken as the name of Osiris. Compare Abd-osir and Osir-Shamar in a Phœnician inscription found in Malta.†

Kheper, with the local name Gath-Kheper, bring to us the name given to the creator Ptah, and symbolized by the scarabæus (חפר). It is curious, moreover, that the name of the late Pharaoh "Hophra" is given as חפרע, as if it were the familiar Kheprā of Egypt. It expresses, however, the , Haabra of the inscriptions.

Surely Sia (סיעא)‡ and still more clearly Siah (סיעה)§ must be Si-aah, son of the Moon-god, and Akhi-ra is a cross-bred name, like Puti-el, "a brother is Râ," the great Egyptian sungod.

Bathyah (בתיה) || "the daughter of Pharaoh" may well stand beside Bath-anat (or Bent-anat) the favourite daughter of Râmeses II., the form of names being parallel and purely Semitic.

The divine name Yah seems to me to be equally involved in the local name Beth-ia in the Karnak lists of Palestine of the time of Thothmes III. If it be really so it is well worthy of remark, and may fitly stand beside the name in the list No. III. in Mariette's Karnak, which Brugsch identifies with Penuel Paaun'el.** Beth-yah would be nearly equivalent to Beth-el.

Another name, long before the Exodus, appears to contain the divine appellative Yah. It is the remarkable name of a

* *Sp. B.*, *Ec.* i. 15; Vigouroux, *La Bib.*, ii. 230.

† Cheyne, *Isaiah*, ii. 135; *Ex.* vi. 24; *Ebers*, *Aeg.*, 159.

‡ *Neh.*, vii. 47.

§ *Ezra*, ii. 44.

|| *Chron.* iv. 18.

¶ No. 97.

** 312.

man in Egypt in the time of Amenhotep I. Kafeniāa . The first element is *, which occurs in Khafni (Hophni) a pugilist, and is also found among names in Himyaritic inscriptions.† The composite name would mean “a combatant is Yah.”

Some other Egyptian names.

It is worth while to mention, by the way, that one of the earliest Egyptian names in Holy Scripture, Hagar, occurs as the name of a king of the XXIXth dynasty Hag'r) known by the Greeks as Achoris; Brugsch spells the name Hagar.

Takhpenes (תַּחֲפֵנִיס) is the name of an Egyptian queen‡ whose sister married Hadad the Edomite in the time of Solomon.

Now the name Ta-apenha occurs as that of the Mother of Aahmes,§ an officer of Darius in Egypt. The local name given as Tahpanhes appears as Ta-benet in the Delta, the Greek Daphnæ Pelusiæ, and the present Tell-Defenneh, if Brugsch be right.||

I fancy that some Biblical names may throw light on the interesting question of the race to which we must ascribe the beautiful queen Thii , the consort of Amenhotep III., who is believed to have been a foreign princess, and who appears to have introduced the worship of the solar disk (*Aten*). Her father's name was Iuaā, and her mother's Tuaā. In the Louvre is a group of an Egyptian nobleman,¶ with his wife Taei, and their infant. Her complexion, like that of Queen Thii, and this race, is painted rosy, and not yellow like the Egyptian women. Iuiu, Uai, Nai, are names belonging to the same race, neither Egyptian nor Semitic.** It was conjectured by M. Emman. de Rougé that they were Libyans. But we find some names in the Bible of a similar cast, and in a quarter with which the Egyptians had much to do. We find a Tai,†† or Toü (or Thai, Thou) King of Hamath, with a son Iuram, or Ioram. (Heb. יורם or יורם; and יורם, or הדרם, Hadoram). Now Hamath was at that time (of David)

* Lieblein, *D. de Noms*, p. 183; *Brugsch, Hist.*, i. 255.

† *R. des études Juives*, i. 50.

§ Cooper, *Arch. Dict.*

¶ *De Rougé Mons. du Louvre*, 32.

†† 2 Sam., viii. 8, 9; 1 Ch., xviii. 9.

‡ 1 Kings, xi. 19.

|| *Brugsch, Hist.*, ii. 358.

** Pierret, *Dic.*, 533.

an independent Hittite kingdom, the rival of Syrian Damascus. I would compare the name of Thaï or Thaü with Thii and Taei, and that of Iuaä, her father,* with Iva, or Ava, a city mentioned in connection with Hamath. The Syrian regions of the Hittites, and the land of Naharina, were familiar to Amenhotep III. And I would set these names beside that of a town in Syria, Thiaï, or Thai, or Thia

, , mentioned in the Karnak lists of Thothmes III. next in order to Shabtuna,† an important place near the lake of Kadesh on the Orontes, and not far south of Hamath, in the midst of the Hittite region. The Hittite ladies appear to have been fair in complexion and to have had delicately-formed features, as shown by a beautiful relief in porcelain in the British Museum. Is it not probable that these fair foreigners in Egypt were Hittites, and not Libyans?

From the time of the Hyksôs, or even before, Egypt gives us many traces of Biblical names.

For instance, Shua, the "Canaanite of Adullam," whose daughter Judah had married, is the familiar name of the Hyksôs themselves, Shaua.

Anub and Anan (Onan) are among the names of the Hyksôs rulers.

Sekhem was not only the name of the renowned city below Gerizim, but also of a district of the Delta, whose capital was Pi-beset (Bubastis), and its Egyptian meaning was not only "sanctuary" but "possession," as in Jacob's words in his blessing of Joseph.‡

Compare, again, the mutilated name of the time of Meneptah "Ba'al . . . son of Zapur"§ with Balak, son of Zippor, of the same period, and remember that Zipporah, the wife of Moses, was a Midianite, not far removed from Moab.

Names in Palestine and Syria.

As regards the nations by whom the land of Canaan was inhabited, we have increasing light from Egypt and Assyria, taken together with the evidence of existing names and living men.

Take the Kheth of Scripture, Kheta of Egyptian monuments, Khatti of Assyrian annals; that splendid race whose ruin-heaps still bear such names as Tell Ketîn in northern

* 2 Kings xvii. 24; xviii. 34; xix. 13; Isaiah, xxxvii. 13. † No. 74.

‡ Gen. xlviii. 22. Pierret. *Vocab.* 531, 532. § Brugsch, *Hist.* ii., 125.

Syria, Heit near their ancient lake of Kadesh on the Orontes, and Hattîn near the Sea of Galilee.

Their existence as a formidable race on the west of the Euphrates is attested in the time of Abraham not only by the allusions in the book of Genesis but by curious passages in the records of Sargina and his son Naram-Sin, by whom they were conquered for a time. From the reign of Thothmes III. they occupy a signal position in the records of Egypt for some centuries, and the "Kings of the Hittites" are no less important to the Egyptians than to David and Solomon and their successors until they were finally subdued by another Sargon, rather more than 700 years before Christ. Professor Sayce, Mr. Boscawen, and others have already given us so much interesting information about the Hittites that we ought to take heed that impending discoveries do not languish for lack of public support and sympathy. That distinguished officer, Lieutenant Conder, R.E., has recently visited the upper Orontes, and, as he and Lieutenant Mantell believe, has identified the renowned stronghold of Kadesh where the great exploit of Râmeses II. was performed. I do not think he has hit upon the right spot yet. But when Kadesh is found we shall possess, as it seems, a Biblical site. For in one passage, at least, this sanctuary is mentioned, namely in the account of David's census,* where we are told that Joab and his officers crossed the Jordan and worked northwards through Gilead "to the land of Takhtim-Khodshi."

All the translators have been baffled by this passage. At last, however, Mr. Cheyne and Mr. Driver, following four codices of the Septuagint, have restored (as it appears) the true reading, and we find Joab passing through "the land of the Hittites unto Kadesh." The difference in the Hebrew is but slight, but the meaning as clear and obvious as possible. I have also some belief that this Kadesh occurs in a familiar passage. The magnificent twenty-ninth psalm describes the thunderstorm rolling over Lebanon, breaking the cedars and shaking the "wilderness of Kadesh." Now it seems to me that the region of the highest waters of the Orontes, where Kadesh stood by its lake beyond the northern end of the Lebanon, where the storm would roll across to the mountains of the Ansairieh, is a far more likely wilderness (*midbâr*) to pass before the mind's eye of the poet than Kadesh Barnea three hundred miles to the south. If that be so, then this

* 2 Sam., xxiv.

capital of the Hittites, next in renown to Karkemish, is twice mentioned in holy Scripture.

In treating of Biblical names, it is only fair to allow that the Hittite names recovered from Egypt and Assyria differ in character from the few that appear in the books of Scripture. But the whole question is in a very nebulous state at present. The lists of names which appear to include those of Hittite places and persons present a curious mixture of Semitic language with some other element. The names in Scripture may be Hebraized. Some Hittites (Uriah for instance) may have received new names. And we must wait with patience for a solution which will most likely come in due season.

The Amorite is well known in Egyptian record and wall-sculpture, and at this day both Northern Syria and Southern Palestine bear witness to his dwelling-place, herein confirming the notices of Scripture.

Tell Amârîn, north of Hamah, 'Amary, by the Lake of Kadesh, Tell 'Amârah in the Lejah, and in the south the 'Amârîn mountains and other places, are stamped with this ancient name. In the great battle-pieces of Egypt they appear in their strong chariots and on their castles "walled up to heaven," with bow, and buckler, and spear. They are closely associated with the Hittites, and "the land of the Amorites" round the upper Orontes tallies exactly with that of the book of Joshua,* where Aphek (Afka) is on their border.

The Amorite has marked one celebrated mountain, "Mount Hermon, which Hermon the Sidonians call Sirion; and the Amorites call it Shenîr,"† and in Assyrian history it bears the Amorite name of Shanîru.

The Gergashite (גרגשי), is likewise found among the northern allies against Egypt, if we take the probable explanation of the Kerkesh mentioned in the monuments of Râmeses II. It seems to me that the name is preserved in Gergis, marked in Rey's map, very near the Orontes, to the west of Er-Restan (Arethusa), in a most probable position for the Gergashite.

The Khivvites (Hivites) were a people of renown in the days of Moses, and long after. Dr. Friedrich Delitzsch‡ has just identified them with the Khavvat of the Assyrian in-

* Josh., xiii. 4.

‡ *Wo lag das Paradies?* 276.

† Deut., iii. 9.

scriptions (hitherto read Khammat and confused with Amat (Hamath). A very important nation they were in the days of Shalmaneser II., who links them with the "Kings of the Hittites,"* under their king, Irkhulina, in a great league with Benhadad against the Assyrians, who defeated them with terrible slaughter at Karkar.

This agrees very well with the mention of "all the cities of the Khivvites"† with Sidon and Tyre. But I must not attempt to go through all the coincidences of Scripture with the monuments as regards the races of Canaan and Syria. I will only mention the name Mat-amim in the travels of the Mohar, a well-known story of an Egyptian scribe. For Mat-amim would simply mean land of the Emim.

Some Babylonian and Assyrian Names.

And now we must turn to Babylonia and Assyria, whence most important results have been already obtained in the elucidation alike of very early and late names in the Old Testament.

Akkadian, Sumerian, Kassite, Elamite, names on the one hand, and Semitic names on the other, have enabled us to verify the historic data of scripture to an extent quite unexpected and surprising. Thus we have Babel, and Erech, and Akkad, and Kalneh, and Ur, in the records from the earliest times. For the name Nimrod we have more than one derivation. Professor Sayce and M. Grivel give the Akkadian Namar-ud, illumination of the sun (which by no means excludes his human status by the divine solar title), and Dr. Friedrich Delitzsch has lately suggested the possible alternative of *Nu-Marad*, "Man, or hero, of Marad,"‡ a very ancient Chaldean city. This distinguished Assyriologist has treated very carefully the subject of these local names in his new work, "*Wo lag das Paradies?*" M. Lenormant will doubtless deal with them in the next volume of his newly-cast *History of the East*; and those who do not seek information beyond our own language, will find much in George Smith's very useful *History of Babylonia*, edited by Professor Sayce, and in the "*Chaldean Genesis*," and also in the volumes of "*Records of the Past*."

One of the most striking points in this non-Semitic lore is the occurrence of the Elamite name of Kudur-lagamar, with

* *Rec.* iii. 99; v. 32.

† 2 Sam., xxiv. 7.

‡ *Paradies*, 220.

his tributaries in the fourteenth chapter of Genesis, of which I have treated on a former occasion.*

Contemporary with these rulers we may cite Semitic names of considerable interest. Mr. Boscawen writes to me: "Some time ago I made a special study of a number of early Chaldæan tablets of a commercial nature found at Warka [ancient Erech] and Mugheir [Ur of the Chaldees]. These are dated in the reigns of Eri-aku or Erioch (Gen. xiv), and of Hammuragas, and others of that period, and among them I found such names as Abu-Khibu, "father of concealment," Bel-ni, "my lord," Abbu, "green" [cf. אב, but may not the meaning be "fruit?" see Gesenius]; Banu בנה; Lazibu (לצב), Kainu (כונ) [קין], Ram-ena-ya "the lifter up of my eyes," Mukhaidū (מחורה), "the joyful one" [מחירה, Ezra ii. 52., Neh. vii. 54, "perhaps a joining together, Ges.] Abil (הבל) [*Abel*. It is very interesting to find this name, "a son," used absolutely. It was Dr. Oppert who first pointed out the true meaning of *Abel* from the Assyrian]; Abil-irziti, "son of the soil"; Miss Braddon's "only a clod?" [does it not rather mean "son of the land?"] Akhu Sunu (their brother) Akhu-kalli "brother of all," Pirkhu (פרח). There are more than a hundred names of this class," Mr. Boscawen adds. I trust he will make public his study of this very important collection of Semitic names of so early a date. Meanwhile we have here the names Cain and Abel, for Mr. Boscawen identifies the former name in a paper contributed to the Palestine Exploration Fund's statement.† Mr. Pinches has remarked: "almost every proper name in Assyrian, as in Hebrew, tells of some event or circumstance connected either with the birth or the life of the person bearing it."‡

This is very well brought out, with fine feeling and reverence, by Mr. Wilkinson in his work before mentioned on the Personal Names of the Bible. A large number of such names are actual sentences that will stand on their own feet, alike in Babylonian, Assyrian, and Hebrew names. But we must not enlarge on these.

The names which emerge in the captivities on the Tigris and Euphrates are interesting; such, for instance, as those given to the noble Jewish captives in Babylonia. I suppose Belteshazzar (בלטשאצר) is Bilat-sarra-utsur, "Beltis defend

* *Trans. Vict. Inst.*, xii. 37; also see *Studies on the Times of Abraham*.

† *P.E.F.*, 1881. 224.

‡ *Rec.*, xi. 22.

See also Lenormant "*Les Origines, &c.*" xi., 153.

the king." M. Lenormant has suggested that שורק (Shadrak) may well stand for Sutruk or Sudruk, an Elamite name naturalised in Babylon. And as to Meshak (מישך) he says it is evidently an alteration,* under the hands of transcribers, of an original form where the latter element of the Jewish name of Mishaël has been replaced by the appellative of some Babylonian god, perhaps Misha [Marda] kh (Assyrian Ma-sa-Maruduk), and compares the great contraction of Assurbanipal into Asnappar.

But may not the contraction be rather of Misha Sheshak (Assyrian Ma-sa-Sisku) into Meshak?† Dr. Lauth has suggested that Sisku may be a divine name, meaning "the brilliant protector" (Marduk?) Sir Henry Rawlinson had connected the same word with the passages in Jeremiah,‡ where the name Sheshak is mentioned in connection with Babylon, and had taken the word as a divine name.§

Animal Names.

But this paper must not be unduly protracted, and we will now turn to a very different topic, the use of animal names. To these Professor Robertson Smith has called our attention in the *Journal of Philology*, in his remarkable and very striking paper on "Animal worship and animal tribes among the Arabs and in the Old Testament."||

In this paper he connects the "Totem-worship" with its apparent origin and consequences, among barbarous tribes, as expounded by Mr. MacLennan, with usages and tribal and personal names among the Arabs, and through Arabian channels with the tribes of the Hebrews, but especially Judah, and in a smaller degree Benjamin, Simeon, and Dan. There is much that is very shocking and sorrowful in this disquisition, as in other recent inquiries of a similar kind. This should make us the more highly value the "sweetness and light" of Moses and Samuel and the prophets.

The class of animal names are claimed as derived from a stage of fetish-worship, and "the line of descent is through the mother who gives her totem to her children." This is connected with abominations proscribed in the books of Leviticus and Deuteronomy, of which the very proscription proves its own need.

* *La Divination*, p. 178.

† Jer., xxv. 26 ; li. 41.

|| *Journ. of Philology*, ix. 75.

† *Proc. S. B. A.*, 1881, 48.

§ Her., i. 506.

It seems to me that Mr. Robertson Smith has made out a strong case with regard to the Arabs in their præ-Mohammedan ages; and he is quite right in tracing the influence of their tribes in southern and eastern Palestine; and perhaps in a great degree he justly connects even in the days of David the outrages against Mosaic rules of domestic morality to such sources as he indicates. Some of the most interesting names involved in this inquiry are such as "Oreb (Raven) and Zeb (Wolf); Caleb (dog) whose position as a proselyte from Edom has been so well traced by Dr. Plumptre in his excellent "Biblical Studies;"* Khamôr of Shekhem (wild ass), Ja'el (Ibex); Ephraim and Ephron (Fawn), 'Eglon (calf), Akhbor (mouse), Shaphan ("cony" or rock-badger), Khezer (swine); and the like.

Doubtless the question thus raised will be carefully considered and examined in detail by those best qualified to decide on its merits. The subject of Biblical names could not be fairly treated without indicating this fresh departure. Let us remember that it is not the judgment of the prophets that is impeached by any of the painful exposures of religious defection in the children of faithful Abraham. There is much justice in the concluding sentences of the essay. "It is a favourite speculation that the Hebrews or the Semites in general have a natural capacity for spiritual religion. They are either represented as constitutionally monotheistic, or at least, we are told, that their worship had in it from the first, and apart from revelation, a lofty character from which spiritual ideas were easily developed. That was not the opinion of the prophets, who always deal with their nation as one peculiarly inaccessible to spiritual truths, and possessing no natural merit which could form the ground of its choice as the people of Jehovah. Our investigations appear to confirm this judgment, and to show that the superstitions with which the spiritual religion had to contend were not one whit less degrading than those of the most savage nations. And, indeed, the second commandment, the cardinal precept of spiritual worship, is explicitly directed against the very worship of the denizens of air, earth, and water, which we have been able to trace out. It does not appear that Israel was, by its own wisdom, more fit than any other nation to rise above the lowest level of heathenism."

* Strahan, 1870.

Conclusion.

It is only due to my audience and to this vast and fertile subject that I should end as I began by craving your kind forbearance.

There are some branches of the inquiry into Biblical names too sacred and dark with glory, some too fresh and uncertain, some too old and familiar, to serve our purpose this evening. But within my old line of historic illustration I must affirm that to me there appears a coherency between the names, brought from quarters scattered and for all the intervening ages forgotten and unexplored, and their position and surroundings, in the scripture narratives, or oracles, or poetry, which to an honest seeker after truth is "confirmation strong," and may well rank high as "proof of holy writ." It has been elaborately shewn by the recent surveyors and explorers of Palestine, that the geographical and topographical names mentioned in Egyptian and Assyrian monumental records, and in classic and rabbinic literature, and now found in the mouths of the fellahîn, in numberless instances chime with the Bible story.

If we have caught this evening startling glimpses of "high places" and "chambers of imagery," it is only what a thoughtful student of scripture might expect; and readers of Pleyte, Tiele, and similar writers, have seen the dark shadows cast in gigantic proportions. Out of how rough and deep a "hole of a pit" has our Redeemer in all ages drawn the fair stones of His new Jerusalem! How does the perverse mind of man forsake the living fountain, and hew out for itself broken cisterns.

We would "justify the ways of God to man." We cannot justify the ways of man to God.

APPENDIX.

My best thanks are due for several kind contributions of notes and suggestions received since the above paper was printed.

The Lord Bishop of Bath and Wells writes:—

Very many thanks for your valuable, interesting, and suggestive paper.

The animal names strike me as very interesting, and the argument from the agreement linguistic, moral, and religious, between the names and the surrounding circumstances of those who bore the names, is very cogent as unmistakable evidence of historical truth. As regards Caleb, to whom I see you refer at p. 15, I believe the discovery of his Edomitish ancestry

and the proof of it was my own, as given in ch. ii., sect. ii., of my *Genealogies*. I have not seen our Dean's *Biblical Studies*, to which you refer.

The Rev. T. K. Cheyne, Fellow of Balliol :—

A number of combinations are quite new to me. Maharaï= Mohar is very attractive. Sippai, Bebai, Besai, Shua, Zapur: Sheba, as connected with Sbat and Seb. (Do you mean that the connexion with "seven" is a "Volksetymologie," Gen. xxi. 30? or that "seven" is a numerical symbol for the Egyptian god?) Can you trace a connexion between Bast and Baal, as objects of worship? Otherwise, are we helped by the similarity of Beset and Bosheth? [See below.—H. G. T.]

Barzillai, Sheshai, Talmai. The first must be very plausible, for it strikes me at once that I have heard it before, and yet I do not think I have.

I would rather not have to do with an Accadian god in a Hebrew name, until I am compelled (Ammi-hud).

Zedek. It occurs as a separate divine name in Philo of Byblus, does it not? Zidqa is evidently adopted from a god.

Tob, I suppose, does not occur alone as a personal name (a *region* in "Judges").

Abraham: I remember Harkavy, but think it is delusive. Better an Aramaizing pronunciation of Abram.

Cain: very interesting. We had only a Himyaritic Qainu before?

Abil-irziti. ? comp. אִירְחִי (אִירְחִי) the patronymic.

As to names compounded with *ab*, *ab*, *ach*, &c., comp. P. de Jong, "Over de niet *ab*, *ach*, *enz*, zamengestelde Hebreeuwsche eigennamen. Amsterdam: J. Müller, 1880." Noticed by Graf Baudissin in the Leipzig *Theolog: Literatur-zeitung*, Jan. 1, 1881. I have no doubt you know Nestle's "*Die Israelitischen Eigennamen*," Haarlem: 1876. On the compound names the two appear to differ—de Jong thinking that Nestle and those who agree with him have gone too far. I have not seen de Jong's book, and my prejudices are with Nestle. De Jong seems to think that divine names were sometimes otiose, and merely added to make a new name ("like Hermobios with Bios, and Diogeiton with Geiton"). He so explains names like Abijah and Achijah.

I see you have given Mr. Driver and myself the credit of the emendations in Samuel. Hitzig and Wellhausen were, as noticed in Q. P. B., our authorities. "Wilderness of Kadesh." Very plausible, supposing the psalm to be an early one. [Is it not, as generally accounted, "a Psalm of David"?—H. G. T.]

Mr. Cheyne has also favoured me with the following valuable note on זָבַל, as interpreted "height" rather than "habitation" (p. 5), in confirmation of his views expressed in his work on Isaiah, vol. ii. 155 :—

Two things seem clear—1. That זָבַל is an almost forgotten Hebrew root; in Gen. xxx. 20, the writer selects an alternative root זָבַר (itself almost confined to proper names) to illustrate זָבַלָן. 2. That זָבַל was specially

applicable to the heavenly or the earthly **היכל** of **יהוה**. (1) justifies us in expecting some light from Assyrian; (2) in presuming some idea suitable to a palace. I suppose most of the houses at Jerusalem were low, and the **אַרְמָנִים** would domineer over them, and above all the Temple?

Of course, a vague sense like "habitation" may just do. But I do not see that it has any *greater* claim, at any rate, than "elevation"; it looks, indeed, very much like a guess. One may no doubt quote 1 Kings, viii. 13, and say that **זָבַל** is parallel to **לְשִׁבְתָּךְ**. But **בֵּית זָבַל** may quite as well be parallel to **מָכוֹן** (**לְשִׁבְתָּךְ** applying to both equally), for **מָכוֹן** itself is a word specially set apart for the heavenly as well as the earthly **היכל** (in passages where **מָכוֹן** occurs). Of course, **מָכוֹן** is not vaguely "habitation," but something firmly founded. I have no fresh light to throw.

I gathered from Sayce that, though Guyard's evidence was not all equally sound, the main part of it was sound; he himself accepted the result.

[See Cheyne, *Isaiah* ii. 155, where the opinion of M. Stanislas Guyard is quoted with regard to the root *zabal* in Assyrian.

It may be worthy of notice that Pierret gives in Egyptian (on the authority of Brugsch) *tsebu* ( ) "cf. **𓂏𓂐𓂏**, *transcendere, superare, elevare, extollere*" (vocab. 726), and notices (p. 739) that **𓂏𓂐** is *acutus*, whence **𓂏𓂐𓂏𓂏**, *jaculum*. Possibly a common root may have existed at the bottom of these words and *zabal*.—H. G. T.]

The Rev. Robert B. Girdlestone, Principal of Wycliffe Hall, Oxford:—

At your request I put down a few annotations on the interesting paper which you are to read on the 16th.

1. With regard to names personal and local. I do not know whether the Balkh, and the Balkan Mountains, or Wallachia, might be compared with the name Belka; [not Wallachia, which is akin to Wales, &c., see Taylor, *Words and Places*, 43.—H. G. T.]; but I should like to call attention to the names you afterwards introduce, viz., Sihon and Eglon. They both end in *on*, but *on* sounds local rather than personal; witness the rivers Pison, Gihon, Jordan, Kishon, Kidron, Arnon; and the places Ekron, Ænon, Aijalon, Ascalon, Maon, Beth-horon, Chesalon, Ezion, Gibeon, Hebron, Hermon, Sirion, Ijon, Lebanon, Sidon, Zion. Compare also Marath-on, which answers in meaning, I suppose, to your own dwelling-place West-on. The names in the new Palestine map have often dropped this termination.

[I am glad Mr. Girdlestone has mentioned Marath-on, which should be compared with Marath-us, and, as I think, Ma-Mortha or Morthia (name of Shekem), and probably Marath-esium in Ionia; all derived from Martu?—H. G. T.]

2. I do not feel sure that you are right in connecting the names Abram, Amram, &c., with the god Ramu. The true God is called **יְהוָה** in Is. lvii. 15, Micah vi. 6, and Ps. xcix. 2, cxiii. 4, cxxxviii. 6. This fact suggests the origin of such names as Adoniram. Abram's name, I venture to think, means "exalted father," and when it was changed to Abraham we must look,

not to the Assyrian *rahimu* (רחם), but to the Arabic *raham* (رحم) which signifies *multitude*.

[As to Ramu, compare my remarks on Tob, &c., p. 4, and the definition given by Hesychius. Mr. Girdlestone mentioned to me the other day the very curious parallel of *mo-rimo*, a word used in a vague way by the Bechuanas on the Kuruman river for some upper power, and rescued by Dr. Moffat for use as the name of the true God, as it now stands in the Sechuana translation of holy Scripture. It was an exotic word and seemed equivalent to the קרומ cited by Mr. Girdlestone from Isaiah, &c., Mo- in the Sechuana word being a prefix.—H. G. T.]

3. Ahiman is connected by you with “manu.” It is observable that the same name is given to a temple-porter after the captivity, 1 Chr. ix. 17. Would a Levitical porter fresh from the Babylonian captivity be named after the Babylonian god of fate? I doubt it; and I prefer the old derivation. [It is curious to find among these porters *Talm-on* and *Akhiman*: comp. two of the sons of Anak, *Talm-ai* and *Akhiman*.—H. G. T.]

4. I am inclined to quarrel with you for your suggestion concerning Melchizedek, and I know not by what authority you call *zebul* a height rather than a habitation. [See Cheyne, *Isaiah*, vol. ii. 155, and Mr. Cheyne’s remarks above.—H. G. T.]

The name Bath-sheba I should connect with the secondary meaning of Sheba—an oath—rather than with the primary. Your reference to Aziz reminds me of Azaz-el, the so-called scape-goat. Comp. the name Azaz in 1 Chr. v. 8, and the names Uzza, Uzziah, Uzziel, &c.; see also Ps. xxiv. 8, where Jehovah is called עֶזְרָא; also note the expression in Daniel—“the god of Forces” (Dan. xi. 38). Was the Nabathæan Aziz a god, or an attribute? [a “divinity of Syro-phœnician origin”—*Pierret. Petit man. de Mythol.* 100] and may not the same question be raised concerning Ram, Zedek, and other so-called gods? [Zedek (Sydyk) took to wife one of the Tanides, and his son was Asclepios. He was one of the two who found out the use of salt. So says Philo Byblius. See Zenormant, *Les Origines*, &c., 541, 545.—H. G. T.]

5. On p. 9 you refer to Sekhem. What is your objection to the traditional spelling Shechem, and to the topographical and descriptive sense *shoulder*, or nape of the neck between the shoulders, so applicable to the position of Shechem. Your reference to the Egyptian meaning of the word adds new interest to Gen. xlviii. 22; where see the rendering in the lxx. [I do not know that we are tied to the diacritic point. Dr. Ebers writes (*Æg. u. d. B. Mos.* 231): “We hazard a comparison between the Egyptian and the Samaritan Sechem, סֶחֶם, Συχέμ, CIKIḲḲ, which, as Ewald has already proved, possessed an old-Canaanitish population, who adhered to Ba’al Berith.” As to spelling, I like kh, for it avoids the risk of the soft *ch* in the mouth of the reader, as in French. It is Dr. Ebers who compares the Egyptian Pa-sekhem. I was familiar with Dean Stanley’s “shoulder” of the mountain, but it is worth while to consider the alternative of “sanctuary,” as in Egyptian: see my paper on Joseph, *Tr. Vict. Inst.* xv. 86.—H. G. T.]

6. With the Kheta compare the Chatti referred to by Tacitus, and the *Χετταιοι* of Strabo. What is the origin of the name Hit on the Euphrates? [The Chatti, or Catti, are said to have taken their name from "the old German word *cat* or *cad*, 'war'": see *Smith's Class. Dic.*

The Kheta seem to owe their name to the word *Kheth*, an inclosure (fenced or fortified), comp. the Egyptian *Khetam*; and *Khatem*, which is the *ring* for the finger, in Heb. *הוֹתֵם*. The well-known site, Sarbut el Khâdem, in the Sinaïtic peninsula, owes its name (says Dr. Ebers) to the old Egyptian fortress (Khetam): *Durch Gosen*. 574. The archaic Hebrew, Phœnician, and Moabite form of the letter *ת* (Kheth) bears witness to its origin in the ground-plan of a square fortress.

Mr. Gladstone identifies the Kheta with the Keteioi of the *Odyssey* (*Hom. Synchr.* 175), but I cannot answer for the Khettaioi of Strabo.—H. G. T.]

7. You remark (p. 11) that the names in Scripture may be Hebraized. I suppose they have been, from Adam downwards, unless Hebrew may be taken as a fair representative of the one primæval language, an idea which few would accept.

[I cannot at all agree with this sweeping supposition, for I think that the foregoing paper itself supplies many names alien to Hebrew which have been little altered; in some cases barely transliterated.—H. G. T.]

8. (p. 14). You refer to Sheshak. Compare the theory of Brugsch as to the Assyrian origin of the name Shishak.

9. Your remarks on animal names are very modest and cautious. Could you not suggest a learned inquiry as to a *totem* system amongst ourselves? Think of the hundreds of animal names that we possess, such as Pigg, Hogg, Wolf, Lyon, Deer, Sparrow, Bird, Nightingale, Partridge, Dove, Drake, Wildgoose, Fish, Sprat, Pike, Carp, Herring, Mackrell, &c. &c. What a mine for the investigator!

But, seriously, there is a very interesting question connected with animal names, and having an important bearing on the history of language. Did animals give names to attributes, or attributes to animals? We read in Gen. ii. 19 that God "brought the animals to Adam to see what he would call them, and whatsoever Adam called any living creature that was the name thereof." Turned into plain English, what does this mean? is it that there is a correlation between sight and sound, and that our first parent, by a quickened instinct, was prompted to utter a distinct articulate sound answering to the special features or peculiarities of each object presented to his eye? or is it that each object suggested some marked attribute and was named after it? Thus the question arises: Whence did Adam derive the names of the attributes? I am inclined to think the first alternative the true one—that animals and other sensible objects received names from Adam, and that each name thus instinctively given originated the verbal, adjectival, and other forms. It would be interesting to test this theory by an examination of the Accadian and other primæval languages. Pardon the hastiness of these annotations, and accept my thanks for your paper, and especially for your suggestive remarks on the name Mary.

The Rev. A. Löwy, an eminent Orientalist, well known for his noble exertions on behalf of the outraged and oppressed Jews abroad, has kindly given me the following notes :—

You take “*ram*” as the name of a deity : in that case you have to explain the frequently recurring name “*Joram*” or “*Jehoram*.” It seems to be a much simpler method to regard *ram* as a eulogistic epithet, just as *Joezer* (Jehovah is a help) or *Jonadab* (Jehovah is a liberal [bestower of bounties]), &c. (p. 4). *Tob* and its opposite *r’a* do not strike me to be divine titles. *Tubiel*, *Tobiah*, are eulogies of the deity in the same way as *Tobal*. “*Ahira’ ben Enan*” bore a name of dispraise, and reminds one of the biblical phrase “*ra’ ayin*” (an evil eye), Prov. xxiii. 6, and xxviii. 22.

There are many instances that men and families assumed, defiantly, a name of reprobation to suggest that the individual gives the *dementi* to the badness of the name. For example, in Italian—*Malocchio*, *Malvoglio*, &c.

I have been interested in your combination of *Baal* and *Bosheth*. The latter denoting “pudor,” appears as the female goddess by the side of Baal, and is sometimes used as a synonym ; see Jerem. xi. 13, “According to the number of the streets of Jerusalem have ye set up altars to *Bosheth* : altars to burn incense unto Baal” (the English authorised version has misrendered the word *bosheth*, and given the clumsy translation “that shameful thing”).

The change of *Jerubaal* into *Jerubosheth* (2 Sam. xi. 21) and *Mephibosheth* into *Mephibaal* is another illustration of this synonymy, but there is in the Bible a tendency to convert Baal (=Lord) into the less dignified form *Bosheth* (=shame or disgrace). See in regard to the aversion to the name of Baal *inter alia* Hos. ii. 19 (in the authorised version, ii. 17).

[Bes is identified with Set (=Baal) in the Ritual (see Pierret, *Dic. d’Arch. Eg.*, also id. *Petit Man. de Myth.* 131), and wears the “skin of a lion, entirely concealing his face, and giving it a Gorgonian appearance” (Birch in *Wilk. Eg.* iii. 148), and Bast is the feminine Bes, and equally lion-faced. Also, Set is a lion (solar animal) with eagle-head (solar bird). This is the gryphon of Set or Ba’al.

The festival of Bast at Bubastis (still called Tell Basta, the Pi-Beset of the Egyptians and of Ezek. xxx. 17) seems, by the account of Herodotus (ii. 60), to have been of a kind to entitle Bast to the stigma of the Hebrew Bosheth. I am much interested to find the identification of Bosheth with the feminine Ba’al (=Bast) confirmed by Mr. Löwy. The Amu were assigned to Bast, as their tutelary deity, by the Egyptians.—H. G. T.]

The CHAIRMAN (the Master of the Charterhouse) said :—I am sure you will all desire that I should tender the thanks of the Institute to Mr. Tomkins for the very interesting paper he has just read. It ranges over a multiplicity of subjects—every name affording an opportunity for a separate discussion ; and I am certain that all of us have admired the manuer in which the author has

condensed so much matter into so small a compass. As one reads this essay one's attention is called to the very great events, and the very startling coincidences to which it refers, and which some of us may, at some future time, be able to follow up. But, of course, the discussion of such a paper as this can only be entered upon by confining one's self to one or two of the particular points which have been raised by the author, and which will probably be found to give quite sufficient opportunity for a very interesting discussion. I may say, speaking from my own point of view, that the general idea which is apt to strike one on perusing a paper like this is, how remarkably Scriptural names and events are continually leaping up in the discovery of those grand antiquities which, as the writer has shown, the researches of antiquarian explorers are constantly bringing to view—relics which tend to throw a great deal of light on names and subjects that have hitherto been a matter of difficulty to the Biblical student. What is an extremely striking part of the paper is that which relates to the Hittites, because this was one of the instances in which imperfect knowledge, giving rise to rash conclusion, aroused objections against the Scriptures with regard to the historical statements they contain—statements which, on further research, we find have not only been justified, but on which modern discoveries have thrown great light. We find with respect to that remarkable people, the Hittites, widely spread as they were—that these discoveries very clearly prove that names, which at first seemed to be unimportant, have been found by the comparisons they suggest, and in other ways, to furnish most important evidence as to the veracity of the records contained in the ancient Scripture history. We observe, too, that these names are connected with the higher attributes and moral virtues we are accustomed to admire. This is the more striking, because sometimes it has been supposed that all these names were simply derived from the heathen gods; but in this paper it is shown that in some cases the names of the heathen gods and goddesses were derived from the attributes which the gods themselves possessed. This makes us think of the origin of pantheism. Probably the first idea of a god was derived from some great truths connected with, and symbolised by, the heavenly bodies. It is not simply that persons looking at those bodies, regarded them as very striking objects, and therefore proceeded to worship them; but, as the investigation goes on, we discover that the myths or legends that have been connected with the heavenly bodies are associated with something symbolical and deep in reference to the motions of the earth and to the stellar system, and also with the moral attributes and physical virtues and strength of human kind. In this way we may go back to the fact that the first notions of religion which God was pleased to give to man were more pure and more widely separated from the worship of many gods which afterwards took possession of the world. We thus are able to see how religion was gradually perverted into the worship of a number of gods, supposed to exercise powers and attributes which, after all, belong only to the one Supreme Governor of the earth. This is what Scripture represents with regard to the origin

of polytheism, and the very names that are thus shown to be connected with the attributes of the Divine power, seem to confirm what we learn from the Biblical source. We know very well, as the author of the paper has mentioned, that at one time, at a later stage of pantheism, it was the custom to worship the moral virtues, such as were symbolised in the well-known Temple of Concord, and in the other temples and altars which we find in the later periods of Roman idolatry erected to *Pietas* and *Fides*, and so forth—the moral attributes in that later stage being personified and made into deities. This is an illustration of the same kind of process, and as the author of the paper remarked, there are one or two traces of this in remote antiquity, which shows that the attributes of virtue and strength were by the pagans identified with separate beings by whom they were supposed to be personified—those beings being constituted into distinct divinities, representing what really from the first were revealed as the attributes of the one true God. (Hear, hear.) These few thoughts have occurred to me in considering this paper; but it is one that is so fruitful of subjects for reflection, that I am sure those who have heard it read must have had many other thoughts suggested to them, and it is now open to anyone wishing to do so, to express his opinions upon any of the points that have been touched on.

MR. W. GRIFFITH.—The learned lecturer has traced many of the words he has mentioned to an Egyptian origin. He referred to the word “Asir,” and connected it with “Osiris,” another form of the Hebrew עֲשִׂיר, the enricher. The readers of our great epic poet may remember the lines:—

“Nor did Israel scape
The infection, when their borrow'd gold composed
The calf in Oreb; and the rebel king
Doubled that sin in Bethel and in Dan.”—MILTON, b. i.

The calf, Apis, was the emblem of, or sacred to (*Diodorus and Strabo*, b. xvii.), Osiris, and Egyptian worship was repeated in after times in Jewish history. Another etymology quoted by the learned lecturer was that of “Bath-Sheba.” Here I differ from him and agree with Mr. Girdlestone that the word “Sheba” is derived from “Sheba,” an oath, rather than from the words “Sbat” and “Seb,” and for this reason we find “Beer-Sheba,” the well of the oath—the well at which Abraham entered into covenant with some of the surrounding tribes. If, then, we have “Sheba,” signifying oath, and “Beer-Sheba” meaning the well of the oath, it seems that we have ground to say that “Sheba” in “Bath-Sheba” would also be of the same origin. Another interesting word that has been cited is the word “Sekhem,” which means “possession.” Being a barrister, I have been struck with the appropriateness to time and place of the juristical ideas which occur in the Book of Genesis. There is no doubt that that history does to a legal mind recall the period of what we may call the law of Nature when possession seems to have been, to use a homely phrase, nine parts of the law—before society was

definitely formed and stable. And so we find that when the different wells were built the different tribes took possession and thus came to have property in them. The well "Beerlabairoi," concisely tells the history of Hagar's desertion by her husband (Gen. xvi. 14). The wells "Esek, Sitnah, Rehoboth," show the non-contentious disposition of Isaac (Gen. xxvi. 17-23). Sir William Blackstone, in his Commentaries on the Law, shows what primitive legal ideas prevailed in those ancient times.

There are numerous words from the Egyptian which seem to have left traces in the Hebrew scriptures. I would call attention to the Egyptian name of Joseph, "Zaphenath-paaneah," which, in Egyptian, signifies the "Saviour of the World." But to pass on from the Egyptian times we should expect that as history progresses, the names would correspond to the periods coincident in surrounding nations. In Numbers we find the name of Pethor, from פֶּתֶר to expound; it seems to be reproduced in "Patræ" of Achaia, and "Pataræ" of Lycia, and as an epithet of Apollo, the god of oracles, in Horace, Odes 3, 465. Some of the most striking coincidences are furnished by the Phœnicians, who constituted undoubtedly one of the most commercial races of ancient times. From Carthage they spread their commerce all over Europe, and we ought to expect to find some traces of the Hebrew language being carried by the Phœnicians to the different countries with which they traded. We have the celebrated name of the god Moloch held up to detestation by a poet greater than Homer or Virgil:—

"Moloch, horrid king, besmear'd with blood
Of human sacrifice and parents' tears;
'Though, for the noise of drums and timbrels loud,
Their children's cries unheard, that pass'd through fire
To this grim idol."

We find traces of the root in the Carthaginian god Malchos, and in the name of their celebrated general Hamilcar. The father of Greek poetry, in the fourth book of his "Iliad," line 8, sings of *Ἡρῇ Ἀργεῖη καὶ Ἀλαλκομένης Ἀθηνῇ*. The epithet *ἀλαλκομένης* (the irresistible) is, according to some critics, given to Athene as the guardian goddess of a city of that name, founded in Bœotia by the Phœnicians. If so, they probably borrowed the name from the Hebrew (Proverbs xxx. 31) *אֱלֹהֵ אֱלִקִּים*. Baal, which, in Hebrew, signifies a ruler, and was the name of the false god of Ahab, may be discerned in the Carthaginian "Bal," god (Servius on the "Æneid"), and also in the last syllables of "Hannibal" and "Hasdrubal." Cornwall, whence the Phœnicians obtained tin, the country of promontories, is by some connected with the Hebrew word *קֶרֶן*. The word "Malchos," which has been mentioned, suggests the names of other gods and goddesses.

"With these in troop
Come Astoreth, whom the Phœnicians called
Astarte, queen of heaven, with crescent horns."

Whether it is possible to connect Astarte with Eostre, the idol of the

ancient Germans, from which Easter, the festival, is said to be derived, is a problematical question; but I think there can be little doubt that the Astarte of the Carthaginians was connected with the Ashtoreth of the Scriptures. Passing on to a later period of history we ought to find many traces of these Hebrew names in the history of Babylon and Assyria. The word Babylon itself connects us with very early times if we look for its derivation. Of course two derivations are given—one is “confusion,” and the other makes it the gate of the god Ilu; but whichever is adopted, it certainly connects the histories together. In Jeremiah l. 2, the Prophet plays with the names Bel and Merodach:—“Bel is confounded; Merodach is broken in pieces.” In the Book of Ezra, a number of Persian proper names, expressed in Hebrew characters, are found sufficient to enable the philologist to compose comparative alphabets of the two languages. I have but culled a few proper names from a few of the books of the Old Testament. But the fortuitous coincidences which may thus be shown between the statements of the sacred historians and other histories corroborate the truth of both. It is to be wished that some writer would take as a model Paley’s *Horæ Paulinæ*, and compose a similar work upon the Old Testament. Broad, obvious, and explicit agreements would prove little; but a plurality of examples would convince the incredulous, and the minuteness, circuitry, or obliqueness of the undesigned coincidences would establish the genuineness of the writings and the authenticity of the narratives.

MR. HORMUZD RASSAM.—I feel that I am labouring under a disadvantage after the learned lecture we have just listened to, and, therefore, anything I may say will necessarily be of a superficial character. In the few remarks I wish to offer I will endeavour to connect the past with the present usages in the land of the Bible, because, knowing as I do from my travels and the discoveries I have made, I think every one, either in this or any other country, will be able to comprehend more forcibly the truth of the Bible by merely riding through the country and examining the languages of the different races, and seeing the marvellous connexion which still links them with each other. With reference to the question of Biblical names, we ought to remember that, with very few exceptions, all the Semitic languages, such as the Hebrew, the Chaldean, and the Arabic, contain words which have a meaning; and it is very remarkable that, if you begin with Genesis and end at the old dispensation, we shall find that every name has a connexion with an attribute of a God, whether it is connected with idolatry or the worship of Jehovah. It is the same way in the present day amongst the different nationalities referred to. We must take into account the three distinct sects which exist in the East, and which have occupied a conspicuous position in regard to the inspired Book. I allude to the Jews, the Christians, and the Mohammedans. Amongst these nationalities we find that in most cases every person is named according to the tenet of his sect. Amongst the Christians, men and women are named after their Saints; the Jews take their names from the Pentateuch or the Prophets, such as Isaac, Moses

Daniel, and other holy men ; and the Mohammedans are named after their Prophet and saints, and also after some attribute of God, of which there are no less than a hundred. In the case of the latter, for instance, we have Abd-Alhameed, the name of the present Sultan of Turkey, which means "the slave of the Praiseworthy ;" and the name of his late father was "Abd-Almajeed," or "slave of the Glorious one," while the name of his uncle, the late murdered Sultan, "Abd-Alazees," means "the slave of the Precious one." Whether we go to the centre of Africa, Central Asia, or the Arabian or African Sahara, we shall find amongst the Moslem races names such as these I have mentioned ; but the Bedouin Arabs are sometimes called after animals, the Heavenly host, or take other fancy names. There is also the name of "Mariami," which the learned lecturer mentioned, which means "my Mary," and is even now in common use, and appreciated by the females. With regard to the different definitions given to the name of Abraham, I need not remind you that the Bible has been very often assailed, especially in these latter days, and many excellent Christians have unwittingly (without reflecting whether such interpretation is confirmed or sanctioned by Holy Writ), preferred the explanations of the so-called scientific and learned men of the world for the meaning of Biblical names and mysteries, against what we are plainly shown in the Bible. As far as I am concerned, I have always found the Word of God, after no end of assaults, to shine forth with greater brilliancy and truth, and exhibit to us the right understanding after all. It will be found, whatever scientific and literary men say to the contrary, that Abraham means the exalted father, as "Ab" means in the Hebrew and other Semitic languages, father ; and "ram" high or exalted, which word is in Arabic an attribute of God. Then again as to the word of Beersheba or Bethsheba, I would prefer the Word of God before any other saying or writing. We have been told that "Sheba" means seven, and so it is, but the Bible tells us that it means "oath," and such I must take it, especially as it is understood in this sense in Hebrew. We now come to the word "Babel," which has always been understood by Christians, Jews, and Moslems, as derived from the word "confusion" ; and the Bible tells us plainly that this is the meaning of it, but now-a-days we are made to believe that the real meaning of it is the "gate of God," derived from "bab," gate, and "El," God,* because, forsooth, these words have been discovered in some cunieform inscription ; and even the late Dean Stanley followed that anti-Biblical belief, by quoting this error in his History of the Jewish Church. Well, I ask you, gentlemen, would it be right to take that interpretation before the Word of God, seeing that if you go amongst the Arabs, who know nothing about the Bible, and ask them what "Babel" means, they will tell you that God had confused the tongue of the people of old, and that was the reason the monument of the first unbelief was called "Babel." It is very remarkable that in the time of Nebuchadnezzar, the Jewish names of Daniel,

* "Bab" has the same meaning in Arabic and Assyrian, and EL is the same in Hebrew, Chaldean, and Assyrian.—H. RASSAM.

Hananiah, Mishael, and Azariah, were changed into Belteshazzar, Shadrach, Meshach, and Abednego,—which custom prevails up to the present day amongst the different communities which inhabit that country.* If a Christian becomes a Mohammedan, his name has to be changed, even if he is called Georgis (George), which is regarded as that of a saint, both by Mohammedans and Christians; and so if I became a Moslem my name would be changed, though I bore a name acceptable to Mohammedans. So with regard to the conversion from Islamism to Christianity, though the person's name would be Abd-Allah, Abd-Alkareem, or Abd-Arraheem, all of which are attributes of God, with the "Abd" (slave) added to them, they would be changed to the name of a saint. Moses is considered by the Moslems next to Christ and Mohammed, and they call him "Kaleem Allah" (speaker with God,) yet if a Jew is named after him and turns a Moslem, Moses would be changed to Mohammed, Ali, or some other name implying a connexion with them. To show you how cautious a man must be in giving an opinion about the derivation of some words as they were used two or three thousand years ago, I will give you some illustration of some extraordinary coincidences that have come to my knowledge in the meaning of words. Of course, people must live some years in the country to know what many of these words mean. We have the word "telegraph" in Mesopotamia, as the telegraph system has been introduced into that country, as well as in some other parts of the East. If you go, therefore, amongst the Arabs of that country and ask them what "telegraph" means, they will tell you that it means "to know by wire," because it happens that in *their* Arabic "tel" means wire, and "araf" to know or expound. The meaning of "telegraph," therefore, amongst these people is "to know by wire," or to obtain "knowledge by wire." So if Europe were to be destroyed and Arabic would be the only language extant, an Arab scholar might just as well give it as his opinion that the word "telegraph" was derived from the Arabic words "tel" and "araf"! I must also relate to you a very serious mistake which was made by a friend when we were guests of an Arab Chief by not being able to pronounce the guttural kkaf or k properly. The Chief had killed a sheep for us, of which a sort of stew was made, in which the head, the trotters, the liver, the heart, and other parts of the animal were mixed up together. It is considered polite amongst the Arabs, when a party is seated together, for one to offer the other the nicest thing in the dish; and so my friend, for civility's sake, picked out a bit of the heart and asked the Chief if he would take a piece of that "kalib." Now, in Arabic the words "heart" and "dog" have the same pronounciation, with only this difference, namely, that the first letter of the word, k, must be pronounced more guttural in the word which means *heart*; and any one who cannot make the proper sound would be certain to say *kalib* instead of *kkalib*; that is to say, *dog* instead of *heart*. You can well fancy, then, how disgusted our

* We see also in Genesis xli. 45, that in taking Joseph into his service, Pharaoh changed his name into "Zaphnath-paaneah."—H. RASSAM.

Arab friend was in having been asked to partake of a bit of a dog ! But I soon set the matter right by explaining to the pious Moslem the unintentional mistake. Mr. Tomkins has alluded to the discoveries I have been enabled to make amongst the ruined cities of the East. I am sorry I cannot, for the present, say much about what I have recently been doing, or I should have given you here, before this, an account of my discoveries. Indeed, with one exception, I have not much to tell you beyond what I stated in my lecture two years ago. I will, however, offer you a brief statement of what I have lately discovered. In the beginning of last year, while I was going about seeking for old ruins, as you know I am always doing, for the purpose of discovering something more of the old cities that lie buried there, I met an Arab who told me that he knew of an old ruined city, the remains of which were to be found within four hours' journey of Bagdad,—that is to say, about twelve miles, taking the computation at three miles an hour. As I never refuse to act on any information likely to prove useful, I said I would go with him to the place indicated. I therefore accompanied him, and while we were riding along the route pointed out by my companion, we came, at a distance of five hours from Bagdad,* upon an old ruin of a great magnitude, which I had not seen before ; so large was it that it must have been, indeed, three miles round. I at first thought that that was the place of which he had spoken, so I said to him, "Oh ! this is the place." He replied, "No ; this is not the place I told you of ; it is further on." I then asked, "What is this place ?" He answered, "I do not know." However, I made up my mind that I would certainly explore it when I returned from the other pursuit. We then proceeded onwards, and at length the Arab brought me to the site, which had a most wonderful ancient Babylonian wall. I at once set to work there, but found nothing of any value, and soon afterwards went back to the place I had first seen, and commenced a thorough search. The result was that after digging for four days the workmen came upon the top of some walls, which were found to belong to an extensive ancient building, in which we soon began to find inscribed objects and other relics. I may here remark that I am not an Assyrian scholar. I am only a discoverer of Assyrian antiquities, which I send to the British Museum to be deciphered by those who have made Assyriology a study. We first of all discovered four rooms, and then we came upon a fifth. The first four rooms were paved in what I should call the Assyrian or Babylonian style, *i.e.*, with bricks or stone, but the fifth was paved with asphalte, the discovery of which brought to my mind the saying of Solomon that "there is nothing new under the sun." As this seemed to me a very singular discovery, I ordered the breaking up of the floor, and after we had dug about three feet into it, we were rewarded by the discovery of an inscribed terra cotta coffer, with a lid over

* On this journey I was not proceeding from Bagdad to visit these ruins, but I was out travelling in Southern Mesopotamia, and going towards the city of the Califs.—H. RASSAM.

the incuth; and on taking off the cover we found therein two terra cotta inscribed cylinders and a stone tablet, minutely inscribed, with a bas-relief on one side of it. These relics have been found to be the most important records of the oldest city in the world, known to the Greeks by the name of Sippara, and mentioned in the Bible as "Sepharvaim" (2 Kings viii. 17, and xviii. 34, &c.). The ancient historians tell us that this city was founded by Noah (who is called Xisuthrus) after the Deluge; and according to tradition it was here that Noah buried the antediluvian records. (Applause.) Soon after I had discovered this new city, I had to come home; but I left some workmen under trustworthy overseers to continue the explorations at that place; and I have been informed, since, that they have uncovered some more rooms, in one of which they found a channel built with bricks, inside which were buried nearly ten thousand tablets, some whole and some broken. These, I hope, will soon reach London. (Applause.) We cannot, of course, say, as yet, what they contain, but it is quite possible that they may be found to record something of even greater value than anything of the kind that has hitherto been discovered in the course of our researches. I shall be happy to give you further information concerning this very interesting discovery after I go out and return again. I hope to be able to go out to Mesopotamia after another month, and then I trust I shall be able to make a still further advance upon what has already been brought to light. (Applause.)

MR. W. GRIFFITH.—The mention of the word recalls a passage in the old Testament in which the decree of Cyrus for the restoration of the Jews was said to have been discovered in a coffer or earthen vessel (Achemetha) by Darius.

MR. RASSAM.—Yes, in *Ezra*.

THE REV. H. G. TOMKINS.—With regard to the words "Bath Sheba" and "Beer Sheba," I think Mr. Rassam has not apprehended my point. The word "Sheba" means "Seven," and the "oath" was celebrated by burning seven victims, or the cutting of a victim into seven parts; so that the word "seven" underlies the oath. My point was that Sheba was a numerical symbol of a god; but before it came to mean an oath it meant seven—seven being the numerical symbol of a god.

REV. H. A. STERN, D.D.—It affords me great satisfaction to follow Mr. Rassam. We have followed each other in many places, that were not very pleasant, but I am delighted to do so on the present occasion. Now, as regards the subject before us this evening, no one, who reads the Bible carefully, can doubt that many of the most distinguished names were bound up with important tribal distinctions, with certain localities, and with the worship of the true, and the worship of false gods. Thus the progenitor of the Jewish people is designated "Abram the Hebrew." In Egypt, Joseph is continually called by that name. Now, the family of Abram at that early period could not have won a reputation, that rendered their nationality familiar in a land considerably removed from Egypt. *Ibri*, from whence the

word is derived, does not signify a Hebrew, but a stranger, a pilgrim, a foreigner, one who comes from a far country. This, to some extent, accounts for the condescending reception accorded to Joseph by Pharaoh, who was himself a Hyksôs, or foreigner, one of the last of the Shepherd Kings. The mixed multitudes that came with the Jews out of Egypt, are designated "*ereb rab*," which the Targum Onkelos correctly renders "*nuchrâin*," strangers. In the interesting paper, to which we have just listened, reference is made to the name of Baal and Bosheth, and I was glad to hear Mr. Tomkins say that he took these names for two distinct deities. This the Bible plainly corroborates. It is only necessary to examine the passages, where Baal and Bosheth are mentioned, and the distinction is evident. Baal, like Bosheth, it is true, has in many passages in the Septuagint the feminine article; hence biblical critics come to the conclusion that ἡ βάαλ and ἡ αἰσχίνη are one and the same deity. They overlook the well-known fact that the Greeks were fond of representing everything in the moral and religious life under that form. The statements in the Bible clearly indicate a notable distinction. I will only advert to one or two. In Jeremiah, xi., 13, it is said: "For according to the number of thy cities were thy gods, O Judah, and according to the number of the streets of Jerusalem have ye set up altars to *Bosheth*, altars to burn incense to *Baal*." Again in Hosea ix., 10, "They went to Baal Peor, and separated—literally consecrated—themselves to *Bosheth*." In Ezekiel there is an allusion to *Bosheth* under the name of *Pibeseth*, *Bubastis*, mouth of the *Bosheth*. *Bast* and *Bosheth* involve merely the interchange of a dental letter, which, in the Hebrew, is of frequent occurrence. Now *Bubastis* was a goddess of the Egyptians, whom Herodotus compares with *Diana*. She was worshipped under the form of a cat, to which the prophet appropriately refers, when he declares "*Bosheth* hath devoured the labour of our fathers," &c, &c, There were festivals held in her honour, which correspond with those accorded to the *Ashera* or *Ashtoreth*, the *Venus* of *Phœnician* and *Aramean* mythology, whom, in every respect, she closely resembles. Thus the reference in the Bible to *Bosheth*, *Besheth*, or *Bast* of the Egyptians, indicates a far more corrupt and debasing worship than that offered to *Baal* (without any adjunct), the supreme divinity of the *Phœnicians* and *Canaanites*. Of course, there are other names mentioned in Mr. Tomkins' instructive paper, which deserve serious consideration, and I hope, some members of the Victoria Institute will, on a future occasion, again take up the subject.

REV. J. FISHER, D.D.—I had marked two words which I wished to notice, but they have already been so fully referred to, that I hardly need go into that part of the subject. I may say, however, that one of them was "*Abram*," I do not think this name comes from "*Ramu*," but from "*Ram*," high, and that God changed it to mean "the father of a multitude." The paper, indeed, hints that it was perhaps changed because it was half-heathenish. God also changed the name of Jacob to Israel after the wrestling with the angel. With regard to Melchizedek, I think, according to St. Paul, in the seventh chapter of *Hebrews*, the name does not come from Zedek, the Phœnician god,

as St. Paul describes him as "King of Righteousness, priest of the most high God." Nor do I agree with Professor Smith as to the animal names. Mr. Smith gives a number of names, and says they are connected with Totem worship, his argument being that those who used them were Totem worshippers. I can hardly think he is right in this. We know that Jacob gave animal names to his sons on his death-bed—Judah being designated a lion's whelp; Issachar a strong ass; Dan a serpent; Naphthali a hind; and Benjamin a wolf. This, however, has no connexion with Totem worship; and suppose, taking another view, the names common in our own country were to form subjects of comment three or four thousand years hence, any one adopting Professor Smith's argument would be inclined to say that such names as Bull and Bullock, Cow, Hart, Roe, Buck, Hind, Fox, Hare, Badger, Lion, Wolf, Bird, Cock, Hen, Duck, Drake, and so forth, indicated that those who bore them were Totem worshippers. I certainly cannot help thinking that Mr. Smith is wholly wrong in his argument.

REV. J. W. AYRE.—In the section of the paper referring to "Some other Egyptian Names," I observe the word "Hagar" is referred to as an Egyptian name. Now I have heard it suggested that as Hagar or Hadjar is the Arabic word for "stone," it was translated by Pliny as "petra," and the Romans, not understanding anything about Hagar, gave Arab el Hadjar the name of "Arabia petræa," so that the name Petræa is really a witness to Hagar. There is a similar instance in the case of the Red Sea, or sea of Edom, where Edom, not being recognised as a proper name, was translated "Red;" and Esau, you may remember, was called Edom ("red") because of the incident of the *red* pottage he received for his birthright. There is also a somewhat similar instance in the case of the sea of Ashkenaz, which by the transposition of a letter became "Axeinos" (inhospitable), the Greeks giving it afterwards another name, Euxine, which, if this genealogy of the word be correct, stands as witness for Ashkenaz, the grandson of Japheth. I must leave it to the more learned to verify these suggested derivations.

MR. TRELAWNEY SAUNDERS.—I must apologise, and especially to the ladies, for rising at so late a period of the evening. However, I intend to pass rapidly over the notes which I have made during the meeting, and as I have not come with any prepared discourse, I shall not detain you long. I observe a comparison between "'Aujeh" and "Og, King of Bashan." Now "'Aujeh" means "crooked." I wish to know whether the analogy to be drawn is that the King of Bashan was a crooked man, or hunchbacked? It may be added that the initial letter of both names is the guttural "ain," making their pronunciation "Gaujeh" and "Gaug." Is not the English word "gouge" equivalent?

I now come to the word "am," or "um," as a name of God. This name has exercised very considerable influence, and not only among the ancients. On page 7 of the paper it is said that the form Amon is purely Egyptian. I would here make the remark that the light acquired in recent years on these

subjects has been obtained chiefly by turning to the east for interpretation. It is by the uncovering of buried records, that so much light is now thrown upon these matters, it is by means of the long-lost riches that have been disinterred in Egypt and Assyria. Perhaps we may now go a step further east with equal, if not greater success, and in so doing we may even find existing among living men, the means of interpreting the remotest antiquity. I allude to Bactria and its surrounding highlands, especially the unsubdued and unknown recesses of Kafiristan. With reference to this word "am," I would particularly call attention to a well-known sentence that is understood, or, at all events, is used rather than understood, in the exercise of one of the most widely-extended religions of the world—I allude to Buddhism. The Buddhist religion has a sentence somewhat equivalent to the famous Arabic sentence, which is a part of the ritual of every Mahommedan. The Buddhist sentence is "Om mani padmi hum." In this sentence the word "Am," or "Om," has been referred to the Deity;* and therefore I should be slow to accept the assurance, even on the part of so learned a man as the lecturer, that the word is purely and wholly an Egyptian word.

The Rev. H. G. TOMKINS.—I beg pardon; I never gave such an assurance as that at all. I only traced the word "*Amun*," to Egypt, but I did not say how it came into Egypt. That is part of a very great question.

Mr. TRELAWNEY SAUNDERS.—I look for the origin of the word further east. I am one of those who believe that the origin of the Egyptian language and religion is to be traced much further east than Egypt itself. The late Rev. Alex. Hislop, in *The Two Babylons*, has accumulated evidence of the Assyrian origin of the Egyptian rites. The Bible not only takes us to Babylon, but still further east. The first inhabitants of Babylonia, or Shinar, came from the east of that plain. If we go among the Hindus, and ask them whence they came, they do not tell us "from the east," but they say "from the north-west." One of the most interesting facts communicated to us in those instructive volumes, "*The Sacred Writings of the East*," now being edited by Dr. Max Müller, has reference to the origin of the Chinese. The Chinese say they came from the west. Now, let us just for a moment lay down our bearings from these several points. There is the bearing eastward from the land of Shinar; the bearing north-westward from the land of Bramavarta; and the bearing westward from China. Where do these meet? They meet on the Pamir, the Roof of the World, among those mountains that overhang the ancient Ariana, and which I believe to be the original home of the Aryans. The ancient books of the Zoroastrians say that the people of Ariana Viejo, or old Ariana, were driven away by the snow. When the population became too great in the valleys, and could not settle higher up because of the winter snow, they were obliged to emigrate.

* Some authors translate the sentence thus:—"Oh! the jewel in the lotus, Amen." But others define the Am, Om, or more accurately Aum, as expressing the Trinity of Bramah, Vishnu, and Siva, or Budha, Dharma, and Sanga, indeed the Triune God.—Bryan Hodgson's *Essays*, p. 88. T.S.

Thus we are led back from Egypt to Assyria, and then to Bactria and the Pamir, or the Roof of the world, and Tibet, where we find "Am," the Invisible God, is still worshipped.

Passing to page 5, we are told that "Barzillai" is from "Barzil." This word stands for "iron" in Hebrew; but as "Bar" is a common word for son, and the other syllable is connected with a root signifying "to pour out," besides contributing to a word indicative of "violent heat," perhaps Barzil came to be applied to iron, because it is poured out with violent heat from a furnace. In the case of Barzillai, who was one of David's friends, the word is supposed to be expressive of a hard or austere character when applied to a man; but as applied to the Assyrian God, it seems to receive greater force from the suggested analysis.

My next reference is to "Baal Shalisha." The latter word is said to mean "three." Baal Shalisha is connected with another name, which has been extremely puzzling to me, and that is the "Land of Shalisha." I should be glad if the learned lecturer would only help me to understand why Baal has the attribute of trinity attached to him, or why that particular land should have been the land of the three, and what three. Perhaps we might then understand where the Land of Shalisha is, but up to this time we only know that it is one of the parts visited in the search of Saul for his father's asses.

My next reference is to the word "Maharai," the name of one of David's valiant men. The Hindus have a ready translation for it. Its Hindu equivalent is "Maha-raj," also the identical word "Maha-Rai," both signifying a great king. Further, "Maharai" may be traced through various other forms, as "Major," "Mayor," and "More," expressive of the comparative degree.

I now come to "Pi-nehas," only to say that there is another use for the word "nehas," which I cannot just at this moment recall.

The Rev. H. G. TOMKINS.—You do not mean "nachash," the serpent, do you?

Mr. TRELAWNEY SAUNDERS.—I am not sure about it. (My desire was to refer to the repeated use of "Nahash," or "Nachash," in connexion with the Ammonites, in the Bible, where the word means, besides a serpent, also an enchanter and a seer. But it is a different word from that which forms part of "Phinehas.") I would, however, in the presence of Mr. Rassam and Dr. Stern, put forward with great diffidence the suggestion I am about to make, that the word does not suggest the meaning of the "negro," as Brugsch has it, but its probable identification is with a term applied to princes in Abyssinia—that of "negus." Thus "Pi-nehas" would mean "mouth of a prince." The accepted interpretation is "mouth of brass."

Here is another curious thing. I do not wish to make you laugh by any reference I may make, so I beg you will be serious. I allude to the word "khafni" ("hophni"), a pugilist. You all know that *aleph*, the first letter in the alphabet, may be pronounced in various ways. Well, then, I would ask why should not "khaf," which means a pugilist, be "khuf," and

it is pure English, if you wish to say you mean to deal pugilistically with a man, to assert that you "cuff" him.

The Rev. H. G. TOMKINS.—I think it is probable. You know that *kaph* is the hand to smite with.

Mr. TRELAWNEY SAUNDERS.—One of the previous speakers has alluded to the probable influence of Phœnician commerce in the distribution of these Oriental terms. I agree with him; and with reference to the word "Bosheth," the meaning of which is "folly," is it not synonymous with the word we now so frequently use to express "folly,"—the word "bosh"?

The Rev. H. G. TOMKINS.—I think that is quite right.

Mr. TRELAWNEY SAUNDERS.—Then we have the word "Babel," which means "confusion." I quite agree with what Mr. Rassam said on that subject, in which I follow the leading of Holy Writ, though I also remember that "Babel" means not only confusion, but that "babblers," which is Johnsonian English, is still in use among us. Of course, I do not mean you to conclude from all this that we are part of the ten tribes, or anything of the sort. Well, then, there is an allusion to the "land of Naharina." This has always been regarded as Mesopotamia, between the Euphrates and the Tigris; but I believe it very seldom, if ever, occurs in that sense in the Bible. Whenever Mesopotamia is mentioned in the Bible, it is referred to the rivers of Damascus; but that is a very questionable point.

Then, again, we have a curious word in "Takhtim-Khodshi." "Takht" is a common word at the present day. On the borders of the Indus you have, looking down from the height of 12,000 feet, the Takht-i-Suleiman,—the Throne of Solomon, which I take to mean the land of the high place.

Upon subsequent reference I find that the Hebrew has no connexion either with "thrones" or with "Kadesh." The latter is spelt with *kaph*, but "Khodshi" has *cheth* as its initial. The words appear to mean a "Reclaimed Lowland," and they are applicable to either of the plains on the borders of the Sea of Galilee. There is some reason to believe that neither of those plains existed at the destruction of Sodom, and their comparatively recent reclamation may have caused the descriptive name of Tahtim Kodshi to be attached to them in the time of Joab.

Then, again, there is an allusion made to the name "Cain." There is a Cain, a city of Judah, which I think is now pretty fairly identified. Upon reference, it appears that the Hebrew initial of Cain is *koph* and not *caf*. The city in Judah is spelt the same as the name of the fratricide. So also is that of the Kenite tribes. In that case the points vary in most passages, but not in all. The city of Kinah only differs in Hebrew in the final h, and the points.

With regard to the word "Totem," I take it to be something which we might compare to-day with patron-saints. It had very much the same sort of meaning and use,—namely, the adoption of an animal as the emblem of the particular god to which the family should look.

At the end of the paper an allusion is made to what has been written by Professor Robertson Smith, to whom we should offer our best thanks

for his learned works. I would also say, with reference to the Jews, that if they have not shown a natural capacity for spiritual religion, they have, at any rate, displayed a great natural capacity in other respects. I would add, with regard to that race, that if we want to understand why they became the chosen people of God, we have only to look round at the present day and see what they have become amongst ourselves. When we remember that it was only as yesterday that one of those people was directing the destinies of this country, and when we find so many of this scattered race occupying positions of great influence and control in so many other countries of the world, I say that we have at this moment evidence of the superior capacity of the Jewish people, if they had chosen to use it in the light in which God had given it to them. But they have thrown God spiritually aside, and they have been thrown over by God themselves; but this has not been for any want of natural capacity, but rather through making too much use of their natural capacity, and forgetting their dependence on God.

Rev. H. G. TOMKINS.—My reply to what has been said must be chiefly by way of congratulation on having heard so much since I sat down, from so many distinguished sources. I have only to defend myself against the imputation of falsifying what St. Paul says about Melchizedek. It is true that St. Paul speaks of Melchizedek as King of Righteousness and King of Peace, but not in the first instance, for it was notorious that Salem was the place of which he was King; and in a similar way St. Paul says he was King of Righteousness; but that does not falsify the primary use of the word "Zedek," and therefore it is not at all illogical for a Christian man to suppose that "Zedek," as a Divine attribute, may have been compounded in the name of Melchizedek, just as Salem, which does mean peace in the abstract sense, was yet the name of a place, and was adopted by St. Paul in a secondary manner for his argument. No doubt there are many other points one might follow up with the greatest interest, such as "Anjeh" and "Og," which may have meant the crooked man; but I am not responsible for this. I can only add that what has been said has been extremely interesting.

The meeting was then adjourned.

ADDITIONAL REMARKS BY THE AUTHOR.

Since the foregoing discussion took place I have received from Professor Maspero a most obliging and interesting letter, of which the former part consists of critical observations on my paper. M. Maspero writes:—

BOULAQ, *le 21 Mai*, 1882.

Monsieur,—Vous m'excuserez si je n'ai pas répondu plus tôt à votre aimable lettre: les événements politiques sont venus compliquer mes occupations journalières et m'enlever le peu de temps dont je disposais. Je

saisis un moment pour vous remercier des brochures que vous m'avez envoyées et vous dire ce que j'en pense.

Le premier mémoire sur les noms bibliques me paraît indiquer une bonne voie. Les hébraïsants rejettent systématiquement l'aide que pourrait leur offrir l'antiquité égyptienne et assyrienne; en Allemagne ils affectent de mépriser les assyriologues et les égyptologues; en France, s'ils n'ont pas la même superbe, cela tient aux relations d'amitié personnelle qui subsistent entre Renan, Derenbourg, &c., et moi. Votre mémoire si court qu'il soit est utile, et c'est à cause de son utilité même que je vous adresserai quelques critiques. La plus grave consiste à suivre le système de Mariette et de Brugsch, pour lesquels les transcriptions égyptiennes des noms sémitiques sont fautives et peuvent être traitées légèrement. Vous verrez dans le dernier numéro de la Zeitschrift une étude sur la liste de Thoutmos, en suite à mon étude sur la liste de Sheshonk, et où j'ai montré combien les transcriptions sont rigoureuses. Pour être à l'abri de la critique, il faut rejeter toutes les transpositions de syllabes, tout les retranchements, toutes les élongations, n'admettre que les transcriptions exactes des articulations correspondantes ou pour *ע*,

pour *צ*, pour *ח*, pour *ח*, pour *ח*, pour *ח*, &c.; sauf dans quelques cas où la substitution dialectale de *א* à *ע*, de *ש* à *ש* ou à *ס* sera prouvée par des exemples authentiques. Cela posé, je n'admettrai pas le rapprochement de la page 5 *כפי* ou *כף* avec Sap, le dieu de l'Est de Egypte. Le dieu de l'Est est *Soupti* aux basses époques,

aux anciennes époques: *כפי* ne renferme pas le radical du mot égyptien, ni le suffixe des noms d'agent. Si vous

tenez au rapprochement égyptien, *כפי* est très exactement

le dieu *Larve*, *Sopi*, une des formes d'Osiris momifié.

P. 6. Le nom n'a pas la valeur *ה ר א*, le de *Hor* est un *ח*, non un *ה*, comme le prouvent les transcriptions phéniciennes; final est la termination patronymique *i*, var.

grecques comme Σαχπηρις de [vide Parthey, "Aeg. Personnamen," 100. H.G.T.]. est un nom d'agent du verbe, le *deveneur*, celui qui devient, formé comme Hori; Seti, &c. פֶּרֶע is la transcription exacte de , non de , comme le prouve la vocalisation ancienne Οὐαφρης, Οὐαφρη, antérieure à la ponctuation massorétique, *Ouh-ab-ri*. De même פֶּרֶע ne renferme pas le פֶּ de

Pour Bethia, vous verrez dans mon étude sur la liste de Thoutmos III. que je suis d'accord avec vous ; mais je ne vois pas comment peut renfermer les éléments de Penuel. La texte hiéroglyphique donne פֶּאוּנֶר, *Piaounr* ou *Piaounl*, ou mieux *Pioll* ou *Piorr*, répondant au son o, et à r ou l sonnante.

P. 8. Il n'y a pas d'exemple prouvé de = ה. Si *Kofnia* est sémitique, c'est plutôt une racine comme *palmes, vitis*, qui répond lettre à lettre au mot égyptien, = י comme dans *Magiddi, Gargamish*, &c.

Pour Tii, j'ai eu occasion de montrer dans le *Recueil* que le nom est égyptien de la plus ancienne époque, et que la soi-disant origine étrangère de cette reine est contraire à tous les documents. J'ajoute que la Tii (Dia, Dii) et Shabtouna de la liste de Thoutmes III. doivent être cherchées dans le massif de Juda, non dans le bassin de l'Oronte.

Since writing my paper I had read the important papers of M. Maspero on some names in the lists of Thotmes and Shishak (*Zeit.*, 1881, 119, *et seqq.*; 1880, 44 *et seqq.*), and had hailed with pleasure a more rigorous method of dealing with the question of identification of names than had yet been applied by Brugsch and Mariette. Some study of Parthey's list of Egyptian names from Greek sources had also led me to see the importance of checking transliterations where it is possible by Greek records. Honest students will gratefully welcome the kind pains bestowed by M. Maspero on my tentative and crude endeavours. Sooth to say, I was not quite convinced as to the native Egyptian origin of the fair queen Tii or Taïa on reading the learned Egyptologist's remarks in *Recueil de Travaux* iii. 127, for is she not represented as blue-eyed?

To sum up briefly M. Maspero's criticisms on my paper, they are to this effect :—

Page 5. Sapi is probably the Larva-god represented as the mummified Osiris-Sapi, or Sopi (see references in my paper on Joseph; *Trans. Vict. Inst.*, vol. xv. 91).

Page 6. Hora must be struck out, as not derived from the Egyptian Horus (an oversight of mine), but the others remain.

Page 7. I will not epitomise the interesting note in which M. Maspero objects to the equivalence of Hophra with the Egyptian . It is worthy of careful study.

Si-aha seems to stand as the Egyptian "son of the Moon-god."

I am much pleased to find M. Maspero of the same opinion as to Beth-ia, and gladly accept his correction as to the former elements in Kafeniā or rather Gēfēnia, which if a Semitic name may mean "Vine of Jah" (see Gesen. on the use of).

M. Maspero objects with much reason to Brugsch's identification of Penuel, mentioned in p. 7. If the reader will revert to the text of my paper, he will be able to assure himself that these acute and learned criticisms do not affect more than a few of my tentative suggestions, and I am the more happy to find that the main line of my inquiry approves itself to so high an authority as "une bonne voie."

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