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LITERARY PAPERS

BY THE LATE

PROFESSOR EDWARD FORBES, F.R.S.

SELECTED FROM HIS WRITINGS IN 'THE LITERARY GAZETTE.'

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"Fame is the spur that the clear spirit doth raise
(That last infirmity of noble minds)
To scorn delights and live laborious days;
But the fair guerdon when we hope to find,
And think to burst out into sudden blaze,
Comes the blind Fury with the abhorred shears,
And slits the thin-spun life—but not the praise."
Milton.

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LONDON:

LOVELL REEVE, HENRIETTA STREET, COVENT GARDEN.

1855.

PRINTED BY
JOHN EDWARD TAYLOR, LITTLE QUEEN STREET,
LINCOLN'S INN FIELDS.

PREFACE.

THE late Professor Edward Forbes having been a frequent contributor, during the last three years, to the columns of the 'Literary Gazette,' it occurred to me that a selection of articles from his vigorous pen, collected into a more enduring form, would prove an acceptable memorial to the Public. Critics writing anonymously are apt to give vent to their feelings with a freedom less reserved in expression than when using their name, and fears were, I believe, excited in more than one quarter, on the announcement of this volume, that its publication might be prejudicial to the author's fame. Professor Forbes was a free and lively spirit, and had many genial qualities. He once affirmed, in a notice of Sir Humphry Davy's 'Salmonia,' that he "would undertake, without travelling far, to furnish philosophers, of various scientific callings, who could ride a race, hunt a fox, shoot a snipe, cast a fly, pull an oar, sing a song, or mix a bowl, against any man with unexercised brains, or even with

none at all, in the United Kingdom ;” and this argument, drawn in a measure from his own experience, may have led to the idea that he had written many things, whether in jest or earnest, that it would be ungracious at this time to reproduce. To those who were really acquainted with his private writings, no such fears presented themselves. Edward Forbes was a bold thinker, but he used a guarded pen ; and a cautious style became natural to him. Originality of thought and humour, unassuming gentleness of disposition, and a sincere appreciation of the labours of others, were the characteristics of his life, and writings. It is not assumed that the papers which follow represent the full power of his mind. Reviews of books written at comparatively little notice, and restricted to a few short columns, may not have the importance of more sustained compositions, but they are, at least, the more lively and ready expressions of the writer’s thoughts and feelings.

The portrait of Professor Forbes, prefixed to the volume, has been executed from a recent daguerreotype by Claudet.

L. R.

January 1st, 1855.

BIOGRAPHICAL SKETCH.

EDWARD FORBES was born in 1815, in the Isle of Man, where his father was a banker. "We have heard himself say," remarks the writer of an obituary notice, in which we recognize the sympathizing pen of an eminent naturalist, "that his love of natural history dated from his earliest childhood. This propensity, or rather passion, was inbred and all his own, for no individual of his family, or even acquaintanceship, had the slightest taste for scientific studies. His first printed guide or text-book was one of the driest, Turton's Translation of the *Systema Naturæ*; and by the time he was seven years of age he had collected a small but tolerably well-arranged museum of his own. Next, though in very early life, came the perusal of Buckland's '*Reliquiæ Diluvianæ*,' Parkinson's '*Organic Remains*,' and Conybeare's '*Geology of England*,'—rather hard reading that last for a boy, and probably rather

wrestled with than understood. These books however, when he was not more than twelve years old, inspired him with a warm and abiding love of geology. At this period also he compiled a manual of British Natural History in *all* its departments, a youthful labour, a reference to which we know he afterwards found serviceable up almost to his close of life."

Having been sent to the University of Edinburgh, where the studies are less absorbed with mere mathematical and classical learning than at our own Universities, he cultivated his taste for natural history under the able teaching of those veterans in zoology and botany, Professors Jameson and Graham. It was however chiefly to the zeal of the latter in leading forth his pupils in botanical excursions to the Highlands, that Edward Forbes was indebted for the direction given to his pursuits in after life. Animated with a love of nature in her gentlest and most attractive form, and possessed of singular kindliness of disposition, he inspired his companions with a rare ardour in their pursuits, and he was the centre of a band of naturalists, all of whom have risen more or less to scientific eminence. Scarcely a year

passed without some botanizing or dredging excursion, and long before he arrived at manhood he had made himself acquainted with the fauna of the Irish Sea, inhabiting the shore of his native island. At the age of eighteen, Edward Forbes made a spirited excursion, in company with a fellow-student, to Norway. On reaching the Scandinavian coast, "the billowy aspect of whose little gneiss hills presented a sight of a new and unaccustomed character," he wrote home in June, 1833, "we entered Arandal, and settling ourselves for a week's stay, we strolled into the neighbourhood, with all the charms of novelty and a foreign land before us. The aspect of the scene of our Arandal rambles was that so beautifully expressed in the fitting language for such scenery by our poet laureate, the immortal Southey :—

"Pine-cover'd rocks

And mountain forests of eternal shade,
And glens and vales on whose green quietness
The lingering eye reposes, and fair lakes
That image the light foliage of the beech,
Or the grey glitter of the aspen leaves
On the still bough thin trembling."

Desirous of penetrating to the wilder and more mountainous districts of the country, the youthful

travellers took ship in about ten days to Bergen. Here they spent a week, and among other records characteristic of the zeal with which they pursued their researches we find the following: "Amongst my Bergen treasures I especially value a quantity of sand, which I found in a spitting-box in my lodgings. As yet I have only examined a small portion; but I expect many minute curiosities in the shell way from it. Several species hitherto only found in Britain have rewarded my search already." From Bergen the naturalists started off on a regular walking expedition. "It was our first decided tramp under the knapsack in Norway; and what with our bags and hammers, and botanical boxes and books, we were pretty well loaded, not forgetting boards enclosing the paper to dry our plants in;" and thus equipped, they spent several weeks collecting specimens and observations, and in visiting the glaciers.

Eight years after this, Professor Forbes joined, as naturalist, the surveying expedition to the Mediterranean of H.M.S. Beacon, under the command of Captain Graves, part of intervening years being spent in examining the plants and animals of the Isle of Man, towards the description of

which appeared, in 1838, a little volume entitled 'Malacologia Monensis,' and in researches among the Hebrides, Orkneys, and Shetland Islands. The year 1837-1838 he, however, spent in Paris, attending the classes of the Jardin des Plantes, and here, as at Edinburgh, intermingling his scientific studies with miscellaneous literary pursuits. With the view of training himself for his future career, he gave lectures in the extra-academical school of Edinburgh, and in 1840-1841 appeared his 'History of British Starfishes,' a book most delightfully written, and furnished with wood-engravings, in which subjects of scientific detail, sentiment, and humour are mingled together in novel variety and harmony. The tour to Asia Minor was made by Professor Forbes in H.M.S. Beacon, at the invitation of Captain Graves, while engaged in a survey of the islands of the Grecian Archipelago; and on two occasions he visited Lycia, to assist in the well-known explorations commenced in that locality by Sir Charles Fellows—first in October, 1841, in company with Mr. Hoskyn, when the travellers undertook an excursion of four months' duration into the interior, and fixed the sites of two of the Cibyritic cities; and secondly, in the following

spring, in company with Mr. Daniel and Lieutenant Spratt, when no fewer than eighteen ancient cities, not hitherto known to geographers, were explored and determined. The 'Beacon' was commissioned on this occasion to convey away the remains of antiquity discovered by Sir Charles Fellows at Xanthus, but she proved unfitted for the task, and additional opportunities were thereby offered to Professor Forbes for carrying on that important series of deep-sea observations in the *Ægean*, by the light of which he founded his brilliant theories on the nature and distribution of submarine life in reference to geological changes. During this expedition Mr. Daniel perished from the malignant malaria of the country, and the life of Edward Forbes himself was at one time in imminent danger. "Poor Forbes, the naturalist," wrote Lieutenant Spratt to a friend in England, "was taken ill on the way from Rhodes to Syra, of the country fever, and remained for thirteen days together without tasting food, and without medicine or medical advice." He, however, gradually recovered, and was on the point of proceeding to Egypt and the Red Sea, on a dredging excursion, aided by a grant of money for that purpose from the British Associa-

tion, when intelligence reached him that he had been elected to fill the Chair of Botany in King's College, vacant by the death of Professor Don. On the 8th May, 1843, Professor Forbes delivered his Inaugural Lecture in that institution, and a most original and masterly production it was. The fertility and novelty of his recent researches opened out new views to him, and brought powerfully to his conviction how little had as yet been accomplished in the higher walks of natural science. "Much, very much remains to be done," said the new Professor, "and there is no fresher field for original research and the development of a grand philosophy than that of Natural History." His vast knowledge of natural objects was now quickly appreciated, and he became Secretary and Curator of the Geological Society, and contributed greatly to the value of the Society's Museum in the arrangement of its fossils. He had been elected a Fellow of the Linnean Society on his return from the *Ægean* in February, 1843; and in February, 1845, he was elected a Fellow of the Royal Society, and became ere long a member of its council. On the establishment of the Government School of Mines in connection with the Ordnance Geological

Survey under the direction of Sir Henry De la Beche, Professor Forbes resigned the Curatorship of the Geological Society, and accepted the appointment of Palæontologist to that institution; and on its location in Jermyn-street he was appointed its Professor of Natural History. He gave frequent lectures there, arranged and displayed the valuable collection of fossils, and he published a splendidly illustrated series of monographs of the new species. He also worked hard at intervals in different parts of England, Wales, and Ireland, with his geological hammer; and it was during a campaign in the Isle of Wight that he made that shrewd discovery in the character of the eocene beds which has caused it necessary to alter the tertiary classification of that locality. Last year Professor Edward Forbes filled the President's Chair at the Geological Society; and at the meeting of the British Association at Liverpool, in September last, he filled the President's Chair in the Geological Section. It was in that dignified and honourable post that his admiring geological colleagues, Lyell, Murchison, Sedgwick, Owen, Greenough, Portlock, Smith, Egerton, Ramsey, Jukes, Phillips, and others, saw him for the last

time. On the death of Professor Jameson, the Regius Professor of Natural History in the University of Edinburgh, Edward Forbes was immediately recognized as the man, before all others in Great Britain, to succeed him. "The Chair of Natural History," says an Edinburgh writer, "was with Forbes the highest object of ambition, and had his life been spared it would have been dedicated to extending its already great reputation, so that no school probably in the civilized world would have equalled it in greatness. With this view he had formed gigantic and most able plans, which, through his great influence with the Government, would have been liberally supported, and we have no doubt ultimately carried out. But, arrived at the culminating point of his ambition, and at the commencement of his long-matured schemes of usefulness, he has, by a mysterious dispensation of Providence, been removed from us when we were beginning to appreciate his worth. A chronic disease contracted when in the East, re-excited and rendered violent by a severe cold caught last autumn, and which burst out with uncontrollable fury about ten days ago, was the immediate cause of his premature death." He died November 18th, 1854.

The published works of Professor Edward Forbes consist chiefly of scattered memoirs, and in the 'Bibliographia' of Agassiz and Strickland are eighty-nine in number. His largest works are the 'Natural History of British Mollusca,' written in conjunction with Mr. Hanley, and his 'Travels in Lycia,' with Lieutenant Spratt. He was also a most valuable contributor to Johnston's 'Physical Atlas.' The Geological and Palæontological Map of the British Isles was constructed by him; and a World Map of the highest interest, embodying all the precious results of his own most original researches, entitled 'Distribution of Marine Life, illustrated chiefly by Fishes, Molluscs, and Radiata, showing also the limits of the Homoiozoic Belts.'

L. R.

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LITERARY PAPERS

BY THE LATE

PROFESSOR EDWARD FORBES.

I.

LIFE-DEVELOPMENT, GEOLOGY, AND RELIGION.

DURING the past summer, when we were rambling in the country, hammer in hand, exploring the geological features of a somewhat remote corner of Great Britain, an intelligent young clergyman, whose scientific tastes led him to take a deep interest in our pursuits, was our frequent and very useful companion. When in the course of a pleasant evening spent with a little party of his neighbours and relatives, our friend, responding to curious inquiries, proceeded briefly to explain the nature of our joint proceedings, and the search we had been making for evidence bearing on the great antiquity of one of the most recent of geological formations, it became too evident that he, though remarkable for unpretending piety and purity of

character, was placing, to say the least, his orthodoxy at stake, and raising sundry painful doubts in the minds of his hearers respecting his faith in Christianity. It seemed as if we had gone back to the time when men were accused of irreligion if they maintained the motion of the earth. Yet we were among educated men and women, people of good sense, earnest and charitable. One and all, they would have scouted the persecutors of Galileo, and scorned the notion of antagonism between revealed religion and astronomy as now received. Of that science they had no fear: of geology, a suppressed and ill-concealed terror. The sublimity of the former was regarded as an aid to religion; the investigations of the latter, as the approaches of an enemy to faith. How could such an invidious and false distinction take root in the minds of sensible persons? Simply because they had learned the elements of astronomy in the schools in which they had been educated, whilst the mere mention of geology was a novelty regarded with suspicion.

A youth goes fresh from school to college. Excited by curiosity engendered by the depreciating innuendoes cast out against a novel science by scholars ignorant of its facts and theories, he strays into a geological class-room. It may be that the teacher is possessed of the gift of stirring eloquence. Our young auditor's attention is riveted, first by the language, then by the facts of the lec-

ture. He finds himself in the midst of students who regard the evidence of a vast, an almost immeasurable, lapse of time during the preparation of the earth for man's advent, as established beyond possibility of reasonable contradiction. He listens with wonder to the descriptions of successive creations of living creatures—animals and plants, all different from any now existing—the duration of each epoch lasting through countless ages. The proofs are visibly laid before him in the entombed remains of the primeval beings themselves, in the sections of the prodigious accumulations of mineral matter, the sediment that formed the beds of the primeval seas, in which those remains are buried. The astonished youth asks of himself, "How has it been that nothing of all this has been taught me before? If this be true—and the proofs are before me—how can it be dangerous? Why was I told when a child—in the face of all these facts—that the earth is so young, and now, as a man, that the earth is so very old? Why does the one authorized teacher flatly contradict the other?"

The question is a very serious one, and must be met sooner or later—the sooner the better. The leading truths of geology must not be allowed to appear to be opposed to received doctrines of religion, any more than those of astronomy. The contradiction in the one case, as in the other, is only in appearance. Suppose that the Ptolemaic system were the approved doctrine of our schools

and pulpits, the Copernican of our colleges only, and we should have a parallel state of things to that now holding with respect to geology. As long as it shall be so, so long is there danger of scepticism springing out of science, but no longer.

Geologists, from timidity, or else from a temporizing policy, are apt to shirk and keep out of view the religious bearings of their science, which anti-geologists attack without understanding of its facts or acquaintance with its doctrines. These are two chief causes of the evil. There is no dearth of works upon the relations between geology and revealed religion. But the greater number of them consists of worthless and prosy dissertations. There are a few honourable and admirable exceptions, especially the 'Discourse,' by Professor Sedgwick, and the 'Scripture and Geology' of the late lamented Dr. Pye Smith.

"The majority of their authors," to use the words of Dr. Hitchcock, "although men of talent, and familiar, it may be, with the Bible and theology, had no accurate knowledge of geology. The results have been, first, that by resorting to denunciation and charges of infidelity, to answer arguments from geology which they did not understand, they have excited unreasonable prejudices and alarm among common Christians respecting that science and its cultivators; secondly, they have awakened disgust, and even contempt, among scientific men, especially those of sceptical tendencies, who have inferred that a cause which resorts to such defences must be very weak. They have felt very much as a good Greek scholar would who should read a severe critique upon the style of Isocrates

or Demosthenes, and, before he had finished his review, should discover internal evidence that the writer had never learnt the Greek alphabet."

The author of the valuable and most interesting work before us combines in an eminent degree the qualifications of theologian and geologist.* The character of his religious sentiments is expressed in one of the opening sentences of his first discourse :—

"A fundamental principle of Protestant Christianity is, that the Scriptures of the Old and New Testaments are the only infallible standard of religious truth ; and I desire to hold up this principle prominently at the outset as one to which I cordially subscribe."

Dr. Hitchcock is a veteran American clergyman, of high reputation and unaffected piety. Officially, he is President of Amherst College, and Professor of Natural Theology and Geology in that institution. As a geologist, he holds a very distinguished position, and is universally reputed an original observer and philosophical inquirer. His fame is European as well as American. No author has ever entered upon his subject better fitted for his task. The work consists of a series of lectures, which may be characterized as so many scientific sermons. They are clear in style, logical in argument, always earnest, and often eloquent. The bearings of science, especially of geological science, upon revelation ; the antiquity of the earth ; the

* *The Religion of Geology and its Connected Sciences.* By Edward Hitchcock, D.D., LL.D. Bogue.

demonstration that death has been a universal law of organic beings on our globe from the beginning; the character of the Noachian deluge, as compared with the traces of extensive aqueous action, of which we have geological evidence; the operations and plans of the Creator; the geological proofs of the Divine benevolence; and the argument that scientific truth, rightly understood, is religious truth—constitute the subjects most ably discussed in these discourses. At every turn the author is zealous for the theological value of geological science. He maintains it to be the auxiliary both of natural and revealed religion, and holds that when the religious relations of geology are fully understood, theology will be as anxious to cultivate its alliance as she has been fearful of it in days past.

The difficulties attending the office that Dr. Hitchcock has undertaken are partly stated in his first lecture :—

“But passing by all other sciences, it is my desire to present before you, on this occasion, the claims of geology, as having fundamental principles so well settled that they claim attention from the interpreter of the Bible. I ought however to remark, that there exists a strange jealousy of this science even among intelligent men;—a suspicion that its votaries have jumped at strange and dangerous conclusions through the influence of hypothesis, and that in fact the whole science is little else but hypothesis, and that there is almost no agreement even among its ablest cultivators. It is indeed a comparatively recent science, and its remarkable developments have succeeded one another

so rapidly, as to leave men in doubt whether it would not prove a dazzling meteor instead of a steady and permanent luminary. When the men who are now in the full maturity of judgment and reason (and whose favourable opinion I am therefore anxious above that of all others to secure), when these were young, geology did not constitute a branch of finished education; and amid the pressure of the cares and duties of middle life, how few find the leisure, to say nothing of the disposition, carefully to investigate a new and extensive science! Even though younger men should be found standing forth as the advocates of geology, yet how natural for those more advanced to impute this to the ardour and love of novelty, characteristic of youth!

“There is another difficulty, in relation to this subject, that embarrasses me. It is not even yet generally understood, that geology is a branch of knowledge which requires long and careful study fully to understand; that a previous knowledge of many other sciences is indispensable in order to comprehend its reasonings; that its reasonings are in fact, for the most part, to be mastered only by long and patient consideration; and finally, and more especially, that they will appear inconclusive and feeble, unless a man has become somewhat familiar with specimens of rocks and fossils, and has examined strata as they lie in the earth. How very imperfect must be the most intelligent man’s knowledge of botany, who had never examined any plants; or of chemistry, who had not seen any of the simple substances, nor experiments upon them in the laboratory; or of crystallography, whose eyes had perhaps never rested upon a crystal. No less important is it that he, who would reason correctly about rocks and their organic contents, should have studied rocks. But upon such an amount of knowledge it is no disparagement to say we have no right to presume in all, even of publicly educated men. Before such a state of preparation can exist, it is necessary that practical geology, at least, should

be introduced into our schools of every grade, as it might be with great success."

It is indeed astonishing to witness the ignorance of "publicly educated men," as Dr. Hitchcock calls them, respecting the meaning of the commonest geological phenomena, such as cannot fail to meet their eye at every turn when they go into the country. Many of them are antiquarians, and not unskilled in archæology; they will visit a cathedral, and from evidence of difference of style in the architecture of its several parts, pronounce to a nicety on the several epochs of their construction; or measure a pyramid, and, calculating the time and labour required to raise each tier of massive blocks composing its terraced sides, estimate without much hesitation the years required for its construction. Yet take them along some simple and clear coast-section; show them stratum lying on stratum in regular order; point out the skeletons of extinct creatures that form well-marked layers in the rock; prove by comparison that each series of strata is marked by the presence of a peculiar creation of animals; pick out the pebble, and show that it must have been rolled by water ere it came to form a portion of the solid cliff; call attention to the direction in which the beds of rock now lie, and demonstrate that they must have been moved out of their original position by forces acting over vast areas; show all these things, and more,—and what do we find? Very possibly our friends have

strolled a hundred times along this very section, without seeing in it any other subject for admiration or reflection than its picturesqueness or beauty of colour. A new source of pleasure is opened out to them, and a crowd of new thoughts occupies for the moment their minds. We have often rambled along some such scene with intelligent companions, to whom the word "geology" suggested the idea of some abstruse and repulsive science, to be mastered or even studied only by the few; but who, when the meaning of the clearly-printed pages of nature displayed before them was interpreted simply and without technicalities, deeply regretted that the system of education in which they had been trained had not prepared them for the study of that wondrous book, everywhere spread out for their perusal, the leaves of which are the strata that constitute the foliated investment of our globe.

* * * *

We would earnestly recommend those who yet retain misgivings respecting the bearings of geology on revealed religion, to possess themselves of this interesting work. It is a production alike honourable to Dr. Hitchcock's profession as a clergyman and his status as a man of science. It will extend his reputation on this side of the Atlantic, where his name is better known to professed geologists than among the world at large, although the fame of his discoveries of the footprints of extinct creatures has been widely diffused. His re-

searches on the phenomena of the northern drift are familiar also to British philosophers, and highly esteemed.

Professor Sedgwick is one of the shining lights of the University of Cambridge. His genius, eloquence, and love of truth endear him alike to adepts and students; and his original researches in geology, the science to which his life has mainly been devoted, have gained him a high position among European philosophers. He is no musty bookworm, who would hang back when the world is marching forward, but a pioneer in the cause of science, and one who would not willingly suffer the studies of his *Alma Mater* to lag behind the knowledge of the age. As a member of the Royal Commission at present inquiring into the condition of the older Universities, his comments on their chosen studies must now have peculiar interest; and though the volume before us makes no profession of being an exposition of his sentiments on University education, there is much in it to manifest the spirit of his opinions, and probably also of those of many of the most distinguished men in the colleges of Cambridge.* The original

* *A Discourse on the Studies of the University of Cambridge.* By Adam Sedgwick, M.A., F.R.S., Woodwardian Professor and Fellow of Trinity College. The Fifth Edition, with Additions and a Preliminary Dissertation. John W. Parker and Son.

‘Discourse’ was published eighteen years ago, and has been justly popular among thinking students in all our Universities, old and new. It is an eloquent plea for science, classical literature, and ethics, interwoven with a rather severe criticism on Locke and Paley. In the Appendix, besides other subjects, that of geology, considered in its relation to religion, is dwelt upon at some length, and the fierce and foolish opposition to the rising science, so prevalent when this book first appeared, is ably and vigorously combated. The entire ‘Discourse,’ and the original Appendix, occupy in the present volume one hundred and seventy-six pages out of seven hundred and sixty-four; much about the proportion which the Professor’s favourite “Cambrian System” bears to the whole mass of Silurian strata. The newer formation is doubtless moulded on the older, but spreads widely in many directions, which the Cambrian System or the original Discourse (each may illustrate the other) never contemplated.

The Preface, which forms so large a portion of this new edition, is a work in itself of no small pretension and importance. Excessively discursive, it embraces subjects of the most opposite kinds, and treats them all with equal spirit and learning. Atheism, Pantheism, Vestigianism, Okenism, Hegelism, Straussism, and Puseyism, alternately and intermingled, are splintered or rather pounded by the Woodwardian hammer; the ‘Physio-philoso-

phy,' the 'Vestiges of Creation,' and the 'Tracts for the Times,' are submitted to a like process of critical cleavage. A spirit of deep earnestness pervades all the criticism, and if the handling of his victims be sometimes ruthless and annihilating, the hearty character of the Professor's onslaught must interest the sufferers even when under torture. Especially should it be a pleasure to the mysterious author of the 'Vestiges,' to find his imaginative and elegant philosophy called up from its death-bed to receive a parting blow ere it sink into oblivion.

To the discussion and extermination of the 'Vestiges of Creation,' indeed, the greater part of the Preface is devoted. The dissection, commenced in the 'Edinburgh Review,' is completed here. Some will think that too much importance has been attached by the great geologist to the shallow yet clever book which he holds in such dire aversion. But there is no denying the fact that the speculator in science, who started his theory without a sufficient capital of knowledge to maintain it, got the mastery—so far as the great body of readers is concerned—of trained and learned philosophers. The clear, pleasant, racy, self-sufficient style of the Vestigian captivated, when the dry, heavy, technical disquisitions and manuals of professors in science disgusted. The naturalists were taught the good lesson, by which they cannot fail to benefit, that it is full time to

give the public the results of their researches, and the conclusions at which they have arrived, in plain, readable, and comprehensible language, and not to keep the philosophy of their science to themselves ; for if they do so, others, unqualified for the task, will impose a sham philosophy on the people, who like to have a reason for their belief, and to be assured of the causes of things. The Vestigian professed to give both, and his plausible assertions, in many instances so utterly unfounded that men of science were speechless with amazement, seemed to supply the knowledge required. A notion in science, however absurd, once taken up by an unscientific brain, is as difficult to eradicate as an article of faith, and there are unquestionably not a few respectable persons living, who will continue to believe in the 'Vestiges' to the end of their days—certainly until long after the ingenious founder of their belief shall have abandoned his own theory, for the author of it erred evidently through hastiness, and persisted in error through combativeness ; yet he must have too inquiring a spirit not to inform himself of the real facts of the case sooner or later, and once so informed he can never die a Vestigian. Professor Sedgwick underrates the author he criticizes, however just may be his estimate of the book. The man who succeeds in half-persuading the majority of the readers of his six editions and a supplement to boot, that they and all mankind are the lineal

descendants of mud-worms and monkeys, and this, too, in spite of the protests of all the living investigators of those several animals anatomically and palæontologically considered (man included), has a power within him which might be turned to better purposes ; and when he has added knowledge to that power, will, we trust, do so ; calmly confessing his sins, and publicly recanting his faith in transmutation of species.

The misinterpretation of geological discoveries has been a fruitful source of false speculation, and the number of mares' nests discovered by the Vestigian in ancient strata scarcely exceeded similar discoveries which have been made from time to time by geologists themselves. But the speculator in development was not content to misinterpret ; he misrepresented (probably unconsciously) the facts upon which he founded his theory, or knew them so imperfectly as to forget to mention many of the most important. Professor Sedgwick's searching examination of such misstatements cannot fail to expose the fallacies of the work he reviews, and must do good service, especially among students, by preventing their reception of mistakes for facts. This is conspicuously the case with that part of the inquiry which deals with the first appearance of organized beings. If the theory of progressive development in the Lamarckian sense be good for anything, the earliest creatures of which we find traces should be the simplest and

lowest forms, not only of their tribes, but of all creatures. To the practical geologist it is needless to say that such is not the case ; but so positively and frequently has the statement to the contrary been put forward, that strong and repeated denials, and an appeal to facts over and over again, are necessary to convince numerous able men, many of them men of science, who are not practically conversant with geological researches. Yet no fact is more certain than that the remains of the oldest animals yet discovered do *not* belong to the most rudimentary forms. Instead of sponges, hydroid Zoophytes, Bryozoa and Foraminifera, the simplest types which, under the conditions indicated by the strata, could be expected to occur in the most ancient Palæozoic deposits, we find asteroid and helianthoid Zoophytes, Cephalopods (the highest of Mollusca), Brachiopods, and Trilobites. No person whose acquaintance with zoology is sufficient to enable him to estimate the position in the animal series of a Cuttle-fish or a Crustacean, can for a moment hold the notion that the Palæozoic fauna was rudimentary, if he possess any familiarity with the fossils of the Silurian system. Every day we are learning more and more to recognize the common-sense view that the appearance of genera and species in time has been from the beginning to the present determined simply by the physical conditions adapted for them. The Creator, willing that there should be no great epoch of desolation, has

called into being species after species, organizing each for the circumstances amidst which it was destined to live.

Equally mischievous has been the misinterpretation of physiological discoveries, especially of those which concern the embryonic conditions of beings. Vague analogies have been mistaken for affinities, and the figurative language often necessarily used by the anatomist has been received as literal by writers unacquainted with anatomical science, the principles of which, being rarely studied by others than persons preparing for, or pursuing the medical profession, are the more liable to distortion when taken in hand by laymen, unless they have competent advisers by their side to warn and explain.

After an apt quotation from 'The Alchemist,' Professor Sedgwick thus graphically recalls some of the absurdities which have sprung out of the mistakes we have just censured :—

“ Folly seems immortal ; and what quackery and foolery of the old Poet's day is not rife in ours ? It may have changed its name, but it has not changed its nature ; and, like all other things of this living world, it gives the lie to the theory of transmutation :—‘ Nature doth first beget the imperfect, then proceeds she to the perfect ’—and what is this, in other words, but our theory of development ? The old Poet tells us of the daily practice of breeding scorpions from herbs. We are more mechanical, and breed mites and raise carrots by the fecundating touch of a galvanic wire. He tells us of breeding metals from the elements, and transforming them at the bidding of our fancy.

Our transcendental theorist has a higher flight. He now teaches us to sow oats and reap rye—to breed rats from geese—kangaroos from cassowaries—lions from seals, and elephants from whales. And not content with this, he takes a loftier bound, and turns dead matter into living mind, and jabbering monkeys into thinking men! What folly of the days of Alchemy shows not itself now with its family physiognomy and the stamp of its true pedigree?

“It is rank folly, in matters of science, to trust to authority and discard experiment; but the rankest of all folly is to discard experiment and authority, by an appeal to the suffrage of the multitude; and thereby to make philosophy a matter for brawling and ignorant declamation. On a question of personal interest an uninstructed man, of common sense and honesty, may be a good judge; but on a question of general science, an uninstructed man is no judge at all; for, as a fact of general experience, first impressions are often false, and first generalizations are often rash and incompatible with the broader and higher views of nature. A poet and a satirist may laugh at the fantastic visions of a false philosophy, and call them ‘a pretty kind of game like tricks o’ the cards, to cheat a man with charming;’ but there is a solemn reality in the ills inflicted on the human family by the Father of lies, in whatsoever shape he may show himself, which cannot long be a fit matter for mere scorn and mockery.”

The mischief is even greater when a man of unquestionable science gives the reins to his imagination, and abandons the safe path of induction. This is conspicuously the case with Oken, whose ‘Physio-philosophy,’ one of the most curious documents in the history of science, is a memorable instance of the danger of such a course. In the volume before us we find the fairest estimate of Oken’s genius and of his folly that we have yet

met with among English criticisms, which have either run into exaggerated praise, often of his worst obscurities, or into equally exaggerated censure and unwarrantable depreciation. His discoveries are truly described here as “elevating our conceptions of creative Wisdom ; for they bring under the domain of law what was before less perfectly comprehended in it ;” and his errors are as truly noted in the following estimate of his celebrated work :—

“A philosophy, to be useful, should above all things be clear in its first principles ; but in the work of Oken principles are set forth as if they were axioms, which are one almost unmixed compound of wild, unintelligible extravagance. I have done my best to find some of the principles of sound reason in his fundamental propositions. He tells us, in the first page of his work, ‘that Physio-philosophy has to show how, and in accordance with what laws, the Material took its origin ; and therefore how something derived its origin from nothing.’ Woe betide all human philosophy, if such is to be its beginning and its aim ! I have read his work, and I have striven to perceive some glimmerings of steady light among the mists of his first sixty or seventy pages, and nothing have I seen but an *ignis fatuus* playing here and there, on a darkness that is palpable and impenetrable.

“I complain also of the intolerable dogmatism of his philosophy. Among his most doubtful propositions I find not a syllable of doubt or hesitation. Nor is this all. He is not merely unintelligible—it may sometimes be from clothing his meaning in words derived from a psychological theory ill comprehended by his reader—but he is often untrue to nature in the assertion of material facts, about which any man of common sense may judge, if he but

choose to use his senses. Some pages I may not have comprehended, because I am not one of the initiated in the mysteries of transcendental philosophy; but there are points in Oken's volume on which I dare to give a very positive opinion. All his pages on the structure of the earth give us little more than a compound mass of error, involved in a succession of assertions poured out with the utmost dogmatism, and without one syllable of reserve. Almost everything that he tells us of geology, and much that he tells us of mineralogy, must come under this unmitigated censure. His geology is false to nature in its beginning, and its middle, and its end.

“But it is said that there is a proof of great knowledge in the works of Oken, and many bright original ideas, which may be, and have been, carried out in the illustration of dark and difficult questions of comparative anatomy and physiology. One who aims at everything must needs hit something, and I believe it true that he has done good service; nor would any one grudge him his honour for all that he has done in the cause of science; at least, those parts of science which he has studied practically and knows experimentally. His fault is, that after experimental studies of the sternest kind, after amassing knowledge, from observation, with no common skill, and after exhibiting in his own person that kind of philosophical inspiration which loves to soar from physical facts to physical theories, from particular to general truths, he then chooses to turn round upon us and deny the nature of his own material fabric; and to teach us only, through the mists of Idealism, that very knowledge which he had gained as an experimentalist, or learned from the experimental knowledge of other men, and which he never could have gained by any other method.”

The following admirable remarks may be quoted as fairly representing the received philosophy of the ablest geologists of the day:—

“In every successive *Fauna* of geology we find the same kind of animal subordination we meet with now in the living world ; and the very earliest genera and orders were not organically inferior to the genera and orders of this day which we derive from corresponding grades in the scale of nature. Nay, sometimes the primeval genera and orders are organically superior to their corresponding types in the living world. Again, the general organic plan of nature has been at all times not merely analogous, but identical. If genera, orders, and classes be now distinct and separate, they were equally distinct and separate in all periods of the old world. There is no development on the lines of organic ascent such as to produce confusion ; but if the *theory of development* were true, there must be, on some parts of the organic scale, such a blending and penetration of types as would blot out and obliterate our lines of separation between genera and orders and classes. But we look in vain for any semblance of such obliteration ; and if we try to complete our present scale, by interpolating within it the organic types of the old world, we find no incongruity in our task. The oldest types fall into their place in the general scale, as naturally as the newest. We may, by this interpolation, improve and perfect our general scale ; but we break not down the barriers between genera and orders and classes. They continue as strong and as abruptly marked as they were before.

“The elevation of the *Fauna* of successive periods was not therefore made by transmutation, but by creative additions ; and it is by watching these additions that we get some insight into Nature’s true historical progress. Judging by our evidence (and by what else have we any right to judge ?) there was a time when *Cephalopoda* were the highest types of animal life. They were then the *Primates* of this world ; and, corresponding to their office and position, some of them were of noble structure and gigantic size. But these creatures were degraded from their rank at the head of nature, and fishes next took the lead ; and

they did not rise up in nature in some degenerate form, as if they were but the transmuted progeny of the *Cephalopoda*; but they started into life (if we are to trust our evidence) in the very highest ichthyic type that ever was created. Following our history chronologically, reptiles next took the lead at the head of nature—not by transmutation, but by creative addition—and (with some almost evanescent exceptions) they flourished during the countless ages of the Secondary period as the lords and despots of the world; and they had an organic perfection corresponding to their exalted rank in nature's kingdom; for their highest orders were not merely great in strength and stature, but were anatomically raised far above any forms of the reptile class now living in the world. We have seen however that this class was, in its turn, to lose its rank at the head of nature; and what is more, we have seen that it underwent (when considered collectively) a positive organic degradation before the end of the Secondary Period, and (if we may trust our evidence) this took place countless ages before terrestrial mammals of any living type had been called into being. Mammals were added next (near the commencement of the Tertiary Period), and seem to have been added suddenly. Some of the early extinct forms of this class, which we now know only by ransacking the ancient catacombs of nature, were powerful and gigantic; and we believe they were collectively well-fitted for the place they filled. But they, in their turn, were to be degraded from their place at the head of Nature; and she became what she now is, by the addition of man. By this last addition she is more exalted than she was before. Man stands by himself the despotic lord of the living world; not so great in organic strength as many of the despots that went before him in Nature's chronicle, but raised far above them all by a higher development of the brain—by a framework that fits him for the operations of mechanical skill—by superadded reason—by a social instinct of combination—by a prescience that tells him to act prospec-

tively—by a conscience that makes him amenable to law—by conceptions that transcend the narrow limits of his vision—by hopes that have no full fruition here—by an in-born capacity of rising from individual facts to the apprehension of general laws—by a conception of a cause for all the phenomena of sense—and by a consequent belief in a God of nature.”

Consistent as this view appears to be with the present state of our geological knowledge, it is quite possible that it may be too strongly put. In estimating the value of the appearance of successive tribes of animals in time, we must never forget that the remains of terrestrial creatures are preserved only under exceptional conditions, and that the absence of pulmonated vertebrata from the older formations should be expected even had they existed during the deposition of those strata, when we consider in what a comparatively fragmentary state the sedimentary deposits of the primeval epochs are presented to us now. The Professor eloquently continues:—

“Such is the history of creation. It is not the dream of a disordered fancy, but an honest record of successive facts that were stamped by Nature’s hand on the chronicle of the material world. Where our chronicle is broken and defective, we may acknowledge our ignorance and be silent, or we may speculate analogically on points where true historical evidence is wanting. We may in part, at least, endeavour to explain what is unknown by what is known; for we believe that Nature has been consistent with herself. We are certain that there have been great successive changes in the surface of the earth,—that some of these changes were slow and gradual,—that others were

brought about by the sudden eruption of the pent-up powers of nature, and were comparatively rapid and violent. But each change was in subordination to the general laws of material Nature, and was, we believe, but a prelude to the material conditions which followed, till physical Nature became what she now is. We also believe that the successive creations of the organic kingdoms were in harmony with those physical changes in the surface of the earth,—and that the Fauna of each period formed a kind of prelude to the Fauna that was to follow, till living Nature became what she now is. Nay, we can sometimes discern this kind of organic relationship or analogy, not merely in a broad statement of facts (like some of those above enumerated), but in a closer comparison of the genera and orders that enter into the Fauna of two successive periods. Thus the gigantic *Edentata* (the *Glyptodons* and *Mylodons*, etc.), in the superficial drift of South America, formed a prelude to the part taken up, in our days, by the burrowing armadillos and the climbing sloths; and the gigantic marsupials, in the caverns of New Holland, have a like relation to the kangaroos now bounding on the surface of the country. But while we admit all this, we are not so mad as to affirm that the giants of the former period were the natural progenitors of their dwarfish representatives in the living world. What we do believe is, that the past history of Nature, as it is seen in her geological records, though strange and altogether unanticipated in the speculations of human reason, is consistent and coherent; and that, before the creation of all worlds, there was an *archetype* of nature (dead as well as living, past as well as present) in the prescient mind of God."

The stress laid upon natural history researches, and the value evidently attributed to the sciences of observation, in a volume addressed expressly to the Under-graduates of Cambridge, by one of the

most eminent teachers of that ancient University, lead us to entertain a hope that before very long we may see the natural history sciences playing a prominent part in English University education. A great step has been taken of late in that direction, but much more requires to be done. The fact that a distinguished Professor in one of our old Universities should think it necessary to write an elaborate dissertation for the avowed purpose of preventing the spread of false notions in natural history among its students, and of mischievous opinions arising out of such mistakes, is surely a strong argument in favour of the plea, that a sound training in the sciences of observation, and an acquaintance with their established facts and theories, should constitute a part of the education of every English gentleman and scholar.

More than twenty years have passed since Sir Roderick Murchison commenced those brilliant researches among the most ancient sedimentary rocks that have secured for him a lasting place among eminent geologists. Before he investigated, analysed, and defined the Silurian system of formations, the knowledge possessed by naturalists of the earliest phenomenon of life in our planet was scanty in the extreme—indeed, rather deserving the name of utter ignorance. Under the vague term of ‘greywacke’ were included rocks of

different ages, structures, organic characters, and vast thickness. To bring this chaos into order was the Herculean task undertaken by the author of 'Siluria,' and admirably has he performed the labour. The energy of fifty hammers, guided by as many good heads, all striking at once, could not exceed that of the one man who founded the Silurian system, one of the greatest advances that have been made in our time towards the consolidation of geological science. It is difficult for those whose scientific careers have commenced since the publication of Sir Roderick's first great work, to understand now the peculiar condition of palæozoic geology at the time he started upon his scientific mission. All seems so orderly, clear, and self-evident—Silurian, Devonian, Carboniferous, and Permian, being words that convey definite and precise meanings to the youngest student of a school of mines or geological class-room—that we cannot picture to ourselves the darkness and confusion out of which the definitions were eliminated. The test of the grandeur of the feat that has been achieved is often to be found in the simplicity and order that result from its performance, compared with the obscurity that preceded. Judged by this test, the name of Murchison must stand high indeed.

It is the proud boast of British geologists, that the foundations of many of the great sections of their science, and the establishment of most of the

realms in time enrolled in the scale of formations constituting the crust of the earth, were originated within their native archipelago. The very provincial jargon of working miners and quarrymen, and the local appellations given to rock and soil by our peasants, have become scientific terms, established in the language of philosophical treatises all over the world. When a name was wanting and could not be taken from these illiterate sources, it was struck in a British mint, and among all the stamps that mark the world's rocks as British claims, one of the most widely current and permanently graven is that of 'Silurian.' An old British people, a tribe of borderers, who, under the leadership of the famous Caractacus, fought the Romans, has given its name to far-spreading territories; and could the old Silures be summoned once more to life, they would have some difficulty in finding the true Siluria, so many offsets of their ancient kingdom are now dotted over the map of the world. Since the system named after this province was first announced, Silurian strata have been detected far and wide over the face of the earth. In Germany, France, Scandinavia, Russia, Spain, and the Mediterranean, a Silurian basis has been found on which the other fossiliferous rocks successively repose. In Siberia, China, and India, Silurian strata have either been already demonstrated, or the next thing to it. In both North and South Africa the rocks that come next in order have already been

detected. In Australia, well-marked Silurian types are proved to exist. In North America is one of the grandest developments of the Silurian system in the world, one that has engaged the attention, almost called into fame many minds of force and note, and that displays both physical and palæontological features in wonderful variety and profusion. In South America there are indications of strata of similar age. Now the precise geology of these most ancient systems of sedimentary rocks in all these far-spreading regions, dates the history of its development from the year of the publication of the 'Silurian System,' and can be traced in every instance to the foundations established by the illustrious author of that work. The consciousness of having originated so grand a survey of the most ancient elements of the earth's structure, and the oldest manifestations of life on our planet's surface, is in itself a glorious reward to reap in a lifetime.

In the volume before us a considerable part of the subject-matter of his first great work is embodied by the author.* Its characteristic and peculiar feature, however, lies in the illustration of the original theme by the numerous discoveries that have been made since the year 1839, when the 'Silurian System' was published. During the interval, much that is most interesting concerning

* *Siluria*. By Sir Roderick Impey Murchison, F.R.S., V.P.G.S., etc. Murray.

primeval life has been elucidated, and a wonderful amount of fresh facts gathered, bearing upon the structure and affinity of the earliest forms of animal life. By bringing this onward flow of science to bear upon the results of his exertions among the more ancient rocks, Sir Roderick deserves, and will receive, the thanks of every true geologist.

From a work of this kind it is difficult to quote fragments, yet we would wish to show the method of its construction in a mineralogical fashion—viz. by the production of a specimen. The following notice of the vertical dimensions of the Silurian rocks of the British Isles, may serve to show the non-geological reader the immensity of the formations under discussion, and the vast lapses of time that must have rolled on during their deposition :—

“ We have as yet no means of accurately estimating the thickness of the older deposits of Scotland and Ireland which have been treated of in this chapter ; but I find, on consulting with Professor James Nicol, that the Scottish section given at p. 152 can hardly represent less than 50,000 feet, although we have no indication that the bottom of the sedimentary series is reached, nor have we anything like a completion of the Upper Silurian rocks. With the extension of the geological survey to Ireland (a benefit which it is hoped Scotland may also soon enjoy), we may ere long be furnished with the requisite data respecting the sister isle.

“ In the meantime, reverting to the typical region of Wales and the adjacent English counties, as described in the earlier pages to Chapter V. inclusive, we can appeal to the admeasurements of the Government surveyors. In Shropshire, the Longmynd, or unfossiliferous bottom rocks

(the Cambrian of the Survey), are said to have the thickness of 26,000 feet, or about three times that of the same strata in North Wales; whilst my original Lower Silurian strata of Shropshire to the west of the Longmynd exhibit a width of 14,000. On the other hand, in the region between the Menai Straits and the Berwyn Mountains, where the bottom rocks are so much less copious than in Shropshire, the fossiliferous Lower Silurian, from the base of the Lingula flags to the top of the Llandeilo or Bala formation, (including the stratified igneous rocks,) swells out to about 19,000 feet, and the Caradoc sandstone, on the borders of Radnor and Montgomery, has a thickness of from 4000 to 5000 feet. Taking the greatest dimensions, we are therefore presented with the prodigious measurement of about 50,000 feet of sedimentary strata, in the lower half of which no fossils have been found, the upper part, as above described, bearing a group of fossils to which allusion has already been made, and whose chief characters will be specially considered in the sequel. Although of such vast volume in parts of the region described, it must be observed that the Lower Silurian rocks of other tracts, though precisely of the same age, as proved by their imbedded organic remains, are often comparatively of very small dimensions.

“Though more replete with fossils than the inferior group, the Upper Silurian rocks attain nowhere a greater thickness than from 5000 to 6000 feet, the Ludlow rocks being for the most part more developed than the Wenlock formation. In this way the whole of the fossiliferous Silurians of England and Wales, measured from the Lingula beds to the Ludlow rocks inclusive, have the enormous maximum dimensions of about 30,000 feet; and if we add the conformable underlying sedimentary masses of pretty similar mineral aspect, but in which no fossils have been found, we have before us a pile of subaqueous deposits reaching to the stupendous thickness of 56,000 feet, or upwards of ten miles!”

It is in the concluding chapter that the less practical student will perhaps find more subjects for reflection. The following passages embody some of the author's views concerning the classification of the Palæozoic strata as founded on biological facts :—

“ In speaking of the Silurian, Devonian, Carboniferous, and Permian rocks, let me however explain, that whilst each of the three latter groups occupy wide spaces in certain regions, no one of them is of equal value with the Silurian, in representing time or the succession of animal life in the crust of the globe. When the Silurian system was divided into lower and upper parts, our acquaintance with younger formations simply sufficed to show a complete distinction between its animal remains as a whole and those of the Carboniferous rocks, from which it is separated by the thick accumulations of the Old Red Sandstone. At that period, the shelly, slaty rocks of Devonshire were not known to be the equivalents of such Old Red Sandstone ; still less had the relations and fossil contents of the strata now called Permian been ascertained. Judging from the fossils then collected, it was believed, that the Lower Silurian contained organic remains very distinct from those of the Upper Silurian ; and yet the two groups were united in a system, because they were characterized throughout by a common *facies*. This so-called system was, in short, typified by a profusion of Trilobites and Graptolites, with Orthides and Pentameri of a type wholly unknown in the Carboniferous rocks. And whilst fishes were seen to exist in the intermediate masses of Old Red Sandstone, no traces of them could be detected below the very uppermost zone of the Silurian rocks. Nineteen years have elapsed, and, after the most vigilant researches in various regions of both hemispheres, these great features remain the same as when first indicated. The labours however of those who followed

me, have infinitely more sustained the unity of that system; for its lower and upper divisions are now proved to be connected, not only by such generic types and analogous forms, but further by the community of a very considerable number of identical bodies.

“In a broad classification of primeval life, one eminent naturalist views the Devonian, Carboniferous, and Permian rocks as simply the Upper Palæozoic; the Silurian rocks constituting the Lower Palæozoic. But, whether this ancient series be divided into double or triple classes (some palæontologists preferring to hold the Devonian as a separate and intermediate type), the result of the researches of the numerous authors appealed to in this volume has unquestionably justified the application of the term ‘system’ to the Silurian rocks.

“At the close of the Permian era, an infinitely greater change took place in life than that which marked the ascent from the Silurian system to the overlying groups. The earlier races then disappeared (at least all the species), and were replaced by an entirely new creation, the generic types of which were continued through those long epochs which geologists term secondary or mesozoic (the medieval age of distinct beings). In these, again, the reader will learn, by consulting the works of many writers, how one formation followed another, each characterized by different creatures; many of them however exhibiting near their downward and upward limits certain fossils which link on one reign of life to another.

“In surveying the whole series of formations, the practical geologist is fully impressed with the conviction, that there has, at all periods, subsisted a very intimate connection between the existence, or at all events the preservation of animals, and the media in which they have been fossilized. The chief seat of former life in each geological epoch is often marked by a calcareous mass, mostly in a central part, towards which the animals increase from below, and whence they diminish upwards. Thus, the Llan-

deilo limestone of the Lower Silurian and the Wenlock of the Upper Silurian are respectively centres of animalization of each of those groups. In like manner, the Eifel limestone is the truest index of the Devonian, the Mountain limestone of the Carboniferous, and the Zechstein or English Magnesian limestone of the Permian. Throughout the secondary rocks the same law prevails more or less; and wherever the typical limestone of a natural group is absent, there we perceive the deposits to be ill-characterized by organic remains. For example, the Trias, so rich in fossil contents when its great calcareous centre the Muschelkalk is present, as in Germany and France, is a miserably sterile formation in Britain, where, as in our New Red Sandstone, no such limestone exists."

Sir Roderick contends strongly for the absence of similar geographical arrangements with those now regulating the distribution of land and sea. For this view, although he can scarcely claim the support of all his geological brethren, he urges arguments that are, at least, highly plausible, and certainly worthy of consideration:—

"If the old continents and islands, which existed during the accumulation of the marine Silurian deposits had borne large trees, the numerous researches of geologists in all quarters of the globe must have brought to light some signs of them. For, whilst we know that there are rocks of considerable extent, which, from the fine nature of their materials, may probably have been deposited in an ocean at some distance from a shore, (though we have as yet little or no evidence as to the accumulation of sediment in deep seas, where no currents prevail:) there are, on the other hand, many Silurian districts of the Old and New World, where the form and structure of the deposits bespeak the action of waves and surge, and where the imbedded seaweeds, zoophytes, and other remains, compel us

to adopt the same view. And if the primeval fauna does afford fewer spiral univalve shells than are seen among the animals of the laminarian zones of our modern seas, we may suggest that shore lines, as we understand them, must have been much less numerous in primeval epochs than at the present day, now that the surface has been diversified by lofty dividing ridges on the land and corresponding depressions in the ocean. With this important reservation, we do however obtain as many of those signs of shores as we can expect to find in the earlier deposits.

“Take, for example, the illustrations of this point, furnished by the American geologists from a very wide extent of their country, where the strata are nearly horizontal, and where, without any ambiguity, our kinsmen have traced life downwards in the successive crusts of the earth, to the same primordial zone as their contemporaries have done in Britain, Scandinavia, and Bohemia. The Americans have evidences in their lowest Silurian beds of *numerous trails or tracks of animals*, whether crustaceans or gasteropods, which moved over a film of mud or sand formed by one tide before another covered the impressions, and left them as proofs to future ages of layers which were deposited on the shores and edges of former lands. Again, in other Silurian beds of the Far West, there exists the same abundance of coral reefs as in Britain, and the still stronger evidence of pebbly shores, which, though they must have been beaten by waves, never contain the trace of a land-plant. Why, therefore, wander from such plain facts into the region of theory? And why not admit, what is indeed in accordance with all we have observed, that the very long Silurian era had nearly passed away before trees grew upon the land or fishes swam in the waters?

“In the fundamental facts described in this volume, we cannot therefore but recognize arrangements which, though perfect as respected all truly primeval creatures and plants, were essentially different from those of our own time. For, if the then existing continents or islands

had borne trees, some fragments of them must have been transported in adjacent estuaries, and mixed in the mud and sand, like the vegetables of every subsequent epoch, by the agency of those great streams, of whose mechanical power we have such decisive proofs. The Silurian rocks extend over areas as large, if not larger, than any great system of the following periods; and yet in them alone, I repeat, is there an entire absence of an arborescent vegetation, derived from the then adjacent lands.

“And here it is well to remind the student of the wide, if not universal spread of the primeval strata. In the annexed small general map of the world are represented all the regions over which one or more of the primeval fossil groups are known to exist, as well as those crystalline rocks, which were formed before or are associated with them. In viewing the dark tint of this map we may suppose, that when such extensive palæozoic sea-bottoms were raised into lands, the former continents, from which the sediments had been derived, were submerged. But be this as it may, it is a fact that, in all quarters of the globe, Silurian strata constantly lie in juxtaposition to the other overlying palæozoic formations; and hence it is impossible to apply to the lowest strata any reasoning which does not equally refer to those which repose upon them. For, as the Silurian rocks are constantly found in the same longitudes and latitudes as the Devonian and Carboniferous, why is it that in the one there are never found traces of vertebrata and land-plants, and that in the same places remains of both these classes abound in the other? By no theoretical suggestion therefore can the fair inference be evaded, that things which did not exist during the Silurian period, were created in the very same tracts during the following ages.”

The beautiful volume which contains this general yet detailed *coup d'œil* of the present condition of Silurian Geology is profusely illustrated with

excellent plates and woodcuts ; so numerous, indeed, are the illustrations, that the work will serve all the purposes of a palæontological manual and field companion for the explorer of the older palæozoic rocks. The number of well-selected views and sections ornamenting its pages is very great. Throughout, the labours of others are cited with just appreciation, and merit given where merit is due. Sir Roderick is a true Highlander in this respect, holding that the glory of a chieftain lies in the number and power of his clan. He has indeed gathered about him a noble army of investigators, who have worthily trodden in the path opened out by their leader. Most gratifying, too, must it be to him to perceive how the minutely detailed and laborious researches of the Government surveyors in the British Islands, as well as those of the several States in North America, have all consolidated and confirmed his chief conclusions and classifications, and have rendered to him that award of authority which is ever held by the original discoverer as the most precious of acknowledgments.

Within twelve months no fewer than two thousand copies of Sir Charles Lyell's elementary treatise have been sold and circulated—a fact of no small import. It speaks well for a fast-spreading love of scientific studies, and proves that even if it cannot be said of geology that the number of its

eminent supporters is increasing in proportion to the popular estimation in which the science is held, a knowledge of its facts and principles is becoming widely diffused, and is sought for with avidity.* A year ago we reviewed the work before us, and do not return to it now to do so over again, but notice it anew on account of some important additional pages, brimful of significant facts, and vividly testifying to the rapid advance of geological research. These bear chiefly upon the intensely interesting question of the order of manifestation of life and time. Every unprejudiced thinking man, interested, as every intellectual being ought to be, in the history of the planet upon which he lives, and of the creation of the sum of which he forms a unit, has thought more or less accurately, according to the extent of his scientific knowledge, upon this mysterious problem. Through geology only, co-operating with natural history and comparative anatomy, can we approach to its solution.

Every day it becomes more and more clear, that if the internal heat derived from an original igneous condition of the globe ever affected the arrangements of the animal and vegetable population of the world's surface, it was not within times of which we have any palæontological evidences. In like manner, every day we are approaching nearer

* *A Manual of Elementary Geology.* By Sir Charles Lyell, M.A., F.R.S. Fourth Edition. Murray.

The Ichnology of Annandale. By Sir W. Jardine, Bart. Lizars.

and nearer the conclusion, that if there was ever a gradual progression, whether through development or special creation, of organized beings in time, the lower types regularly preceding the higher, the proofs of such a succession are not to be made out of the assemblage of fossils that has been preserved in sedimentary strata. Far as we can travel through the realms of geological time, infinitely further we must go ere we can hope to discover that orderly arrangement of the proto-genesis to which so many lovers of system fondly cling. Their proper domains are in the Homeric ages of geology—epochs of myths and monsters. They mistake shadows for realities, and, prompted by the love of system and yearning for perfection instinctive in the human mind, magnify plausible hypotheses into theories, long before the significance of the facts with which they deal is such as to warrant the conclusions they draw from them. Geologists and palæontologists are too apt to fancy that they have been favoured with a sight of the world in its swaddling clothes. If we do not much mistake, the Titans were mature giants ere they beat out the oldest stratum upon which the geological hammer has yet rung.

The operation of the geological naturalist, when interpreting the course of primeval history from the fragments preserved of creatures that played a part during its several epochs, is like that of the scholar spelling out a dilapidated inscription on an

ancient sarcophagus. Here and there a word is presented complete, but far oftener only straggling letters, offering but sorry materials towards the discovery of the words and sentences of which they formed an essential part. The several remaining letters of the inscription have very different values, so far as they are of use to the decipherer. One may give so evident a clue, that through it alone an entire word may be guessed at rapidly and with certainty. Half-a-dozen others, although in tolerable approximation, may require days of consideration and calculation ere an indication of their share in the meaning can be elicited. Now, it is exactly so in the reading and interpreting of the fossil facts inscribed on the great monument of Time. Each must be weighed apart, as well as in connection; and the degree of its significance will depend on many and careful considerations. When the socialist demagogue appealed to the Irish patriot, whether one man was not as good as another, the answer he received was, "Ay, and betther!" A like paradoxical reply must be given to all who ask whether one palæontological fact is not as good as another. In one sense—in an exclusively zoological or botanical sense, as the case may be, the equality of value is true. But in another point of view, that which concerns philosophical geology and natural history, strictly so called, one palæontological fact may be of greatly more importance than another. Thus it is clear that, when we argue re-

specting the presence, absence, or degree of development of an order or class of beings in time, the chances of the preservation of the remains of such creatures must be carefully taken into account. We must bear in mind the probable conditions under which each species was likely to have existed, and the chances of relics of more or fewer individuals of it being entombed in the mineral stratum in which we find proofs of its ancient existence. The great majority of organic remains occurs in sedimentary deposits. According as the creatures were inhabitants of an aqueous medium or not, so much more likely are they to be preserved in such strata. According as their habits were fixed, sedentary, or active, so must vary the chances of our finding more or less abundant traces of them. Evidences of the extent and development of the air-inhabiting sections of the animal, and even of the vegetable, kingdoms, must necessarily be regarded as exceptional in the fossil state, considering the origin of the mineral formations in which, for the most part, they have been found. The finding of the skeleton of an aquatic animal in a rock is, therefore, of greatly more significance in geological and natural history import than the discovery of a creature whose presence in such a position must have been accidental. Moreover, we have further to consider the chances of the preservation of the various classes of sedimentary deposits themselves. As we approach the present epoch, we may safely

say that the chances of preservation of deposits formed within fresh-water areas of small extent increase enormously, and with them the chances of our obtaining information respecting the terrestrial and aerial population of the surrounding land, for the probabilities of their envelopment in the sediment of small lakes and pools multiply correspondingly. Every naturalist who has worked as a geologist in the field must have been deeply impressed with the imperfect evidence the great majority of fossiliferous localities can afford respecting the existence of other beings than those which lived in the medium, and under the conditions, that prevailed when the rock was formed in which they occur. Small as is the space swept over by a dredge during a few hours' work at sea, it is in most instances greatly larger than the extent of ancient sea-bottom submitted to the examination of the collector in the outcrops of the several beds of a geological section. When we look at a geological map, we are apt to forget that the sweeps of colour, which mark the spread of particular formations, do not by any means correspond with the extent of surface that has been explored for fossils. Our knowledge of ancient life is at present in the main—far more than people in general suppose—derived from the exploration of a comparatively scanty number of localities, mostly grouped within a very limited section of the surface of the globe. Our geology and palæontology are mainly those of Europe and

eastern North America, with a supplement derived from, in most instances, imperfectly examined extra-limital districts. Nevertheless, for reasons far too numerous and lengthy to be stated here, it may confidently be affirmed that we have arrived at a very clear and complete notion of the succession of geological formations all over the world.

The discoveries, either entirely new or else brought into prominent notice during the past year, upon which Sir Charles Lyell lays deserved stress in his postscript, are the following :—1st. The impressions of well-marked tracks of a fresh-water or estuary tortoise on the Potsdam sandstone, the lowest fossiliferous rock of the Silurian series in North America. The original observer was Mr. Abraham ; the geological position of the beds was settled by Mr. Logan, one of the ablest of practical geologists ; the Chelonian character of the footprints was determined by Professor Owen. A stronger case could not be stated, and at the coming in of this fact goes out the speculation about fishes necessarily preceding reptiles in time. 2nd. The discovery, by Captain Brickenden, of Chelonian footsteps, and by Mr. Patrick Duff of the skeleton of a lizard,—the original of which has been described in our own columns by Professor Owen, and before the Geological Society by Dr. Mantell, —in rocks, to all appearance of the Old Red Sandstone series, in Morayshire. 3rd. The observation, by Mr. Isaac Lea, of reptilian footprints in Lower

Carboniferous strata in the United States. These three important discoveries carry the evidence of the existence of reptilian types through the three great epochs of the Palæozoic period. 4th. The discovery made by Professor Plieninger, as long ago as 1847, but strangely overlooked, of the teeth of mammiferous quadrupeds, probably insectivorous, in strata of the Triassic group—that is to say, in the oldest rocks of the Mesozoic period in Würtemberg. Thus we have evidence of the mammalia having existed epochs before any traces of them had been hitherto discovered. We shall find them next in palæozoic strata. 5th. The finding, by Dr. Debay, in the Lower Chalk of Aix-la-Chapelle, of a great variety of leaves of the higher dicotyledonous plants; thus upsetting the prevalent notion that these forms of vegetable life had scarcely any share in the vegetation of the world during the epochs preceding the Tertiary period. These facts have an intense significance for all who will be content to consider them calmly, logically, and unbiassed by fanciful prejudices. Such however is the firm hold hypotheses about progression still retain, that we feel sure they will be voted exceptional and insignificant by no small number of geologists. Educational influences and early trains of thought have much to do with this. There is a lurking fear in the brains of men, lest the dignity and traditional history of the human race should be seriously affected by the overthrow of the popu-

lar notion of progression of types in time. There are numbers who would rather believe in the transmutation of species, or in spontaneous generation, than give up this cherished doctrine. Common-sense views are the last to take hold on men's minds; for common sense is rightly a free assent to the conclusions of a strict logic, and the casting aside of prejudices generated by the mingling of unsifted knowledge with uncontrolled imagination. On the one hand, inquirers shrink from the contemplation of the countless miraculous interventions of the Creating Power that of necessity must have occurred, if the protoplast of each species had an independent beginning. On the other, they are terrified by the consequence concerning *Man's* position in nature, that springs out of the doctrine of a gradual evolution of all types out of some one original and infinitely inferior protoplast. Neither sect will content themselves with conclusions drawn from full consideration and fair estimation of the facts at present known. For ourselves we fully assent to the remarks with which Sir Charles Lyell terminates his postscript :—

“I shall conclude by observing, that if the doctrine of successive development had been palæontologically true, as the new discoveries above enumerated show that it is not; if the sponge, the cephalopod, the fish, the reptile, the bird, and the mammifer, had followed each other in regular chronological order, the creation of each class being separated from the other by vast intervals of time; and if it were admitted that man was created last of all, still we

should by no means be able to recognize in his entrance upon the earth the last term of one and the same series of progressive developments. For the superiority of man, as compared to the irrational mammalia, is one of kind rather than of degree, consisting in a rational and moral nature, with an intellect capable of indefinite progression, and not in the perfection of his physical organization, or those instincts in which he resembles the brutes. He may be considered as a link in the same unbroken chain of being, if we regard him simply as a new species,—a member of the animal kingdom,—subject, like other species, to certain fixed and invariable laws, and adapted, like them, to the state of the animate and inanimate world prevailing at the time of his creation. Physically considered, he may form part of an indefinite series of terrestrial changes, past, present, and to come ; but morally and intellectually he may belong to another system of things,—of things immaterial,—a system which is not permitted to interrupt or disturb the course of the material world, or the laws which govern its changes.”

Those of our readers who may wish to understand the character of the appearances presented by the footprints of extinct animals remaining impressed on the surfaces of rocks of high geological antiquity, would do well to inspect Sir William Jardine’s beautiful lithographic drawings of reptilian footmarks impressed on the New Red Sandstone of Corncockle Muir. These plates, admirably executed by Mr. Lizars, of Edinburgh, are not minute reductions, but of full dimensions, so that they give a far clearer idea of the aspect of such strangely preserved records than any illustrations hitherto published. We trust that their ap-

pearance will excite general attention, and induce intelligent persons who live in the neighbourhood of extensive quarries, to seek for similar evidences of the ancient presence in their neighbourhood of primeval creatures. We live in hopes of the discovery, sooner or later, of more substantial relics, fragments of skeletons sufficient to enable the comparative anatomist to make out the characteristic features of the organization of the animals whose framework they once constituted. It is indeed truly astonishing to contemplate the number and variety of indications, either by footprint or trail, or in some other manner equally unsubstantial, but nevertheless equally sure, of the ancient existence of living creatures, some of them highly organized, whose solid parts have either wholly disappeared, or have as yet escaped the diligent search of collectors of fossils.

II.

TURKEY AND THE EAST.

THERE never was a time when the future destinies of Turkey excited deeper interest than at the present moment. Menaced by Russia, hated by Austria, neglected by France, and befriended by England, the empire of the Sultan attracts the anxious attention of politicians of all grades of rank and every shade of opinion. It is not the first time that the fate of Europe has been linked with the destinies of the representatives of Mahomet. The liberties of nations have seldom however, if ever, depended on the protection of Mohammedanism; and the Crescent has been the sign of the arrest, and not of the furtherance of progress. Yet our ears are ringing with the applauding shouts uttered by Christian freemen at the mention of the chief among Mussulman sovereigns; and the only threat of war breathed by Englishmen is a defiance of the self-styled Christian Powers, that are muttering vengeance on the nation of infidels who have afforded a truly Christian succour to the exiled pa-

triotis of Hungary. The turban and the fez have become badges of enlightened charity, and truth and justice have sought shelter from their persecutors in the minareted sanctuaries of the East. The thunder-laden cloud that hangs over the future of Europe is too dense and dark to permit even those who stand on the clear and sunny pinnacle of England to discern the features of the dangers that lurk within its portentous folds. But if it be the will of Providence that the storm should not roll away without breaking, the thunderbolts that shall fall will scarcely leave Turkey unscathed, for amid the ruin of the tempest the innocent suffer with the guilty.

Those who know the Turks best, and like them most, entertain but faint hopes of the stability of their empire. No state can hold together, except under very peculiar and unnatural conditions, where the rulers are of a different race and a distinct religion from the ruled; the former being few—very few, the latter many. When the ruled learn their powers, and unite to exercise them, their rulers must fall. The Turks are merely governors of a vast region peopled by nations of opposite creeds and sympathies. Their subjects are not only more numerous, but are also more astute, and, in the mass, capable of a higher intellectual development, than themselves. Moreover the ruling race is not merely hated, it is held in contempt by those whom it has conquered. Yet

are the conquerors by no means deficient in intelligence, and their maintenance of power so long has been mainly owing to their superiority in other qualities,—in courage, earnestness after a fashion, and, above all, in integrity. The bearing of a Turk is the bearing of an honest man; the demeanour of the rayah bespeaks the subtle knave. Many assume that the evil qualities of the rayah are the results of his subjugated condition. We doubt this. The Greek at least, in his most palmy days of freedom, was as vicious and unprincipled as he now is; and though centuries of barbarism have cast him down from his high place among the dignitaries of human intellect, no one who has been much among modern Greeks, as we have, questions that in them lies, still misapplied, all the intellectual subtlety that distinguished their progenitors.

Besides the irreconcilable distinctions of race, there is another cause that must effectually prevent Turkey becoming a stable and powerful state. The country is too large for its population, and that population is not increasing at such a ratio as to cherish any hope of its effectually occupying the country. No state can ever become a power of any consequence under such conditions. This may seem contradictory to those who call to mind the former importance of Turkey among European states. But, in reality, it was the Turks, not Turkey, who constituted the power and made the

impression. Able leaders and enthusiastic followers made themselves felt as if they were a great nation ; but when they settled down, they were too few and too scattered to form an influential people, and the nations they subdued were too different to be amalgamated with themselves. Moreover, the ravages of successive and relentless wars, and of still more relentless famines, had desolated vast tracts of the beautiful and fertile lands upon which they settled. No colonists, no immigrants, came to fill up the blanks, and turn the resources of the deserted country to account. We have journeyed day after day, week after week, over uncultivated fields and untilled plains, where the rich soil and ineffaceable marks of ancient cultivation held out promises of sure and ample reward to the industrious agriculturist. A few peasants cultivating scattered patches of corn-land, and a few wandering shepherds leading the flocks and herds to the choicest morsels of pasture here and there, as inclination or love of change prompted, were all the inhabitants of these once flourishing districts. The tide of emigration, directed by a regulating Providence, is pouring into the most distant and barbarous regions ; but there still remains, close at hand, as if kept in reserve, an ample field for agricultural labour, more favoured in soil, climate, and capability, than any American backwood, Canadian clearing, Australian sheep-walk, or Canterbury settlement. The table-lands of Asia Minor, and

many parts of European Turkey, have still to be colonized. The time may come when they shall be studded with the prosperous homes of the Anglo-Saxon race. If ever such an event comes to pass, it will be through no sanguinary invasion, but by peaceful settlement.

The work of Mr. Spencer furnishes fresh and valuable information respecting the less-known parts of Turkey in Europe.* Well acquainted with several of the languages of the Empire, and accustomed, through long usage, to the habits and peculiarities of the inhabitants, whether Mussulman or Christian, the traveller was enabled to traverse districts seldom visited, and to mix with the people of town and country on familiar terms. A reader of his narrative, and of the political and statistical digressions interwoven with it, will gain a very clear idea of the peculiarities of the several races who obey, or profess to obey, the sceptre of the Sultan, and of the merits and demerits of the government by which they are ruled.

Mr. Spencer commences his tour in Servia, where he finds a people dreaming of extension of dominion, and a population insufficient to work out the resources of the land. The Servians, whatever may be their faults, are an honest and truthful race, and maintain their hard-earned independence prudently and with foresight. Their prince lives in a cottage,

* *Travels in European Turkey in 1850.* By Edmund Spencer, Esq. Colburn and Co.

and rules without pomp, or court, or show. It is a pleasing and not insignificant fact, to find that there is an effective sovereign in a European state who can maintain his power in the fashion of a private gentleman. Education is actively promoted and justice effectively administered. Among the peculiar customs of the Servians, the following one is not the least curious :—

“During my rambles through the streets of Alexinitz, in which, like all the other towns of Servia, we are certain to find something new,—some feature characteristic of this primitive people,—I was struck with the novel manner in which the auctioneer exercises his vocation. When an article is offered for sale, whether a buffalo, a horse, or a lady’s bracelet, a drummer is sent forth to perambulate the town, exhibit the article, and take the biddings. If he can write, he notes them down in his tablets ; if not, why a notch in a piece of wood must serve the same purpose ; and when he has completed his promenade, he returns to the auctioneer, who examines the different amount of the sums which have been offered, and if approved of by his employer, a loud rat-a-tat announces that the highest bidder is the purchaser. Nor is this the only office the town drummer exercises ; he is, at the same time, the crier and the gazette ; he announces the promulgation of a new law by a rat-a-tat, and the most important news of the day ; and it is he who summons the inhabitants to arms, should the fierce Arnout or the Bosnian be making preparations to cross the frontier.”

There are some very interesting notices, in these volumes, of the miniature republics and patriarchal governments that nestle among the mountain regions of the Slavonic districts of Turkey,—small independencies, of which we seldom meet with even

the names. After giving an account of the origin of the confederacies in Upper Mœsia, Mr. Spencer remarks :—

“The patriarchal form of government, and federalism of villages, to which these people are so much attached, is well suited to man in a certain state of society, and particularly to the inhabitants of a mountain district ; at the same time it fosters a republican spirit, and whenever they are sufficiently strong, and the mountainous nature of the locality in which they live affords them the means of defence, their first object is to elect a chief, and virtually establish a republic, conforming however to the laws, and paying the taxes due to the Sultan, as chief of the empire. We have a very striking instance of this at Zagori, in the mountain fastnesses of the Pindus, where we find a miniature republic in the midst of a despotic empire.

“The inhabitants, a mixed race of Slavons, Greeks, and Roumani, pay the Imperial tax to the Sultan, and maintain undisputed possession of their mountain home ; no hostile Osmanli daring to pass the confines of a stronghold where every man is a soldier, and even the women never part with the pistols and dagger that glitter in their belt.

“Again, we have the little state of Tchernegoria, where a population, scarcely amounting to a hundred thousand, entrenched in their mountains, have continued to keep inviolate their own patriarchal form of government, their laws, and customs, in defiance of the whole force of the Ottoman Porte, and that during the most brilliant epoch of its might and strength.

“It is certain that the system of self-government, and the union of tribes and villages into a confederacy for mutual defence, has been the means of preserving the nationality and the religion of the rayahs in a country where force has been too long the law of the land. Their own social virtues also, which shine out in bright relief in all their intercourse with each other, have had the same

tendency. Among this people, the isolating self-interest of Western Europe is unknown; they are generous to each other, hospitable to the stranger, sympathize with the afflicted, and provide a maintenance alike for helpless infancy and decrepit age. Then, let it be remembered, idleness and dissipation, so frequently the heralds of crime in a more civilized state of society, are expressly forbidden; and the man who, in this or any other respect, violates the patriarchal laws of his community, is expelled, and becomes an outcast: even the Haiduc of the mountain refuses to associate with him who is branded by his tribe as a Cain.

“But perhaps the most beautiful trait in the character of this primitive people, is the unfeigned respect paid to old-age. The man who has borne the heat of sixty summers is exempted from every tax, and, should such be his pleasure, he may pass the remainder of his days in indolence, since the hearth of each member of his tribe is to him a home; his blessing is solicited, and he is regarded by old and young with reverence, as a man who is approaching the close of his mortal pilgrimage, when he will be translated to a happier home; and must they not by kindness and good offices propitiate the friendship of one who may soon, in another world, intercede for their unworthiness?”

The statement that railways are preparing, if correct, gives rise to a hopeful anticipation for Turkey. The comment upon it, and the anecdote that follows, are good and very true illustrations of the torpidity and energy so strangely intermingled in the Turkish character:—

“We have however learned from a source that may be depended upon, that the Turkish Government has at length come to a determination of opening lines of railroad communication between Constantinople and the va-

rious commercial towns on the sea-coast, and also with the interior of the provinces; and if we except some of the mountainous districts in Bosnia, Upper Mœsia, and Upper Albania, the undertaking offers few engineering difficulties, and the expense would be but trifling, when we remember that the land would cost nothing, wood is to be had for the trouble of cutting, and the wages of the labourer are low, while iron and coal abound in various parts of the provinces. Indolent from temperament, and ever suspecting the counsel of a Giaour, it is to be hoped that neither of these causes will operate to prevent the execution of a design of such vast importance, and so calculated to increase the commercial prosperity of the country. As the scheme originated with the English, to whom the Turks are attached by motives of political interest, we may entertain some expectation of seeing its accomplishment; and to show their belief in the sincerity of our desire to contribute to their welfare, we will relate an instance that occurred during one of my former visits to these provinces.

“When visiting the newly erected and really splendid military hospital and barracks at Bittoggia, in company with his Highness Darbouhar Reschid, the Vizier, I was surprised and pained to see the number of soldiers swept off by intermittent fever, which was easily accounted for by the vapours arising from a pestilential marsh in the immediate vicinity. On mentioning the circumstance to several Italian and German medical men in the service of the Sultan, stationed here, they unhesitatingly confirmed my opinion,—adding, that they had frequently recommended the removal of the nuisance, by draining the marsh, but without effect. Almost despairing that any representations of mine would be listened to, still I resolved to make the attempt. I explained to his Highness in what manner marsh miasma produced disease, exaggerated its effects, and gently hinted at the possibility of the great man himself becoming a victim, especially as his

very sallow complexion indicated great derangement of the biliary organs. This consideration was decisive; the terrified Osmanli, with all the energy of his race, when once roused to action, immediately despatched his aides-de-camp with orders that every able-bodied man in the town, should immediately, and without delay, commence the important work of draining the marsh. The mandate was peremptory; fat rayah citizens and lazy Turks, Jews and Armenians, who had never before handled a spade, might be seen digging a trench from the marsh to the Monastir-sou, a river that runs through the town; whilst others were busily employed in carrying bricks and stones, and making mortar, to form an archway over it. Still the work was only half done, so long as the town remained imbedded in mire during the continuance of wet weather, which became heaps of sand in dry. In compliance with my suggestions, the Vizier issued commands in the same arbitrary manner for paving it, and removing the butchers' stalls and other impurities."

Every here and there Mr. Spencer met with Turkish gentlemen, mostly officers, of considerable intelligence and acquirements. Now that not a few Turkish youths are permitted to see the world in the great cities of Western Europe, and to acquire knowledge in the colleges of France and England, we may hope for an increase of such characters, through whom much benefit is sure to accrue to their nation. One of these men was the colonel of a regiment at Bittoglia, in Macedonia:—

"Moustapha Bey was altogether a remarkable man, in accomplishments far superior to any Mahometan I ever met with; he spoke the French, Italian, and Russian languages,—the latter fluently, and with the accent of a native of Russia; in fact, there was a mystery about the

early youth and family of the Bey, who, in addition to being considered very wealthy, was highly educated,—a circumstance none of his friends could fathom, not even Halil, whose inquiring spirit generally made him acquainted with the history of every man of note he came in contact with. He was supposed to have been by birth a Caucasian, and to have served in the Russian army; and from some resemblance to the Emperor Napoleon in form and features, he usually went by that name among his comrades. He appeared to be intensely interested in his profession, subscribed to several scientific periodicals of Western Europe, which might be seen, with a profusion of ancient and modern military works, lying on the tables of his apartment.”

There is a prevalent impression that Albania is a region too dangerous for travel—a haunt of brigands and unscrupulous murderers. We have met Englishmen abroad as fearful of venturing into Albania as their countrymen at home are of visiting Ireland. These tabooed regions are, in this respect, alike; they have no dangers for the mere traveller, provided the people are quite sure of his purpose:—

“The worst trait in the character of the Albanians, of whatever tribe or creed, is their implacable vengeance—an injury is never forgotten. On the other hand, they are deeply susceptible of kindness, and display towards each other all the social virtues that distinguish the inhabitants of more civilized countries. The same excitable temperament that leads them to pursue a wrong even to death, shows itself in the enthusiasm with which they give their cattle and provisions to the unfortunate tribe who may fly to them for shelter. At the same time, their unbounded attachment to their chiefs, and their hospitality to the stranger, shine out in bright relief.

“The duties of hospitality, not in this district alone, but everywhere among the Albanian tribes, are held so sacred, that the stranger who has once eaten, or even smoked with one of their people, receives the title of *so-loldnik* (friend of the tribe), and he is never addressed by any other epithet than that of ‘*am vla*’ (my brother), a man whom all are bound to defend with their lives, and see safe on his journey. This ancient patriarchal custom is the principal reason that we never hear of the assassination of a stranger among these simple-minded mountaineers, except from political motives; such deeds are invariably confined to the neighbourhood of some large town, where the inhabitants are more immoral, and know better the value of money.”

Every traveller in the East, unless his star is an exceedingly lucky one, must endure the peccadilloes and unceasing rogueries of his hired servant and dragoman, especially if he be a Greek. Mr. Spencer relates an amusing instance of this species of Oriental trouble, which happened to him when in Thrace :—

“Up to the present time I had borne with my rascal of a Greek *kiraidji*, Demetrius, without coming to an actual declaration of hostilities. I engaged him to take me to Adrianople, and on our arrival there, to pay him a certain number of piastres for the use of his horses and his services. In the numerous villages and hamlets through which we passed, he frequently demanded money. He was very poor, or he had some cousin in indifferent circumstances, to whom he wished to give a trifle; then his own expenses, and the keep of his horses, must be paid. We had scarcely got over half the distance, when, on arriving at a village inhabited by Bulgarians, he made the usual demand for an advance of money; this led to an alterca-

tion, as I found that I had already paid him nearly the full amount I had agreed for. He now refused to proceed any further; positively denied that I had paid him anything; and even had the daring and the impudence to summon me before the Kodji-bacha of the village.

“Our little cause was tried in the presence of the whole of the villagers, who, with their Kodji-bacha, were already predisposed against me, by the representations of the subtle Greek. With great volubility and earnestness of manner, the clever scamp descanted on the unjust manner in which I had behaved to him; described me as one of those horrid Franks,—a species of living vampyre, who travelled through the country, poisoning the inhabitants by giving them pills; and, as a climax to all my misdoings, I was denounced as a Latin heretic—a thousand times worse than a Mahometan, an infidel, who ate, drank, slept, passed over dangerous rivers and crumbling bridges, and even heard the awful thunder, without making the sign of the cross! The women screamed and crossed themselves, the men gnashed their teeth, and the grave Kodji-bacha frowned most menacingly!”

The Greek calculated beyond his mark. His master addressed his judges in Slavonian. The people were delighted—men and women alike regarded the accused with favour. Something about the kiraidji had excited suspicion of his character when originally hired. Mr. Spencer, anticipating evil, had taken the precaution of making his servant affix his mark, since he could neither read nor write, to an agreement before starting,—the English Vice-Consul at Gallipoli being present,—and repeated the process whenever he advanced Demetrius money. The mark was a cross. The fact was stated to the Kodji-bacha. The Greek met it

at once, by declaring that it was only a clever trick of the heretic Frank to cheat him :—

“ We now waited the verdict of the village Solomon, who, with true Oriental gravity, pondered over the case for some time in deep silence. At length, he requested Demetrius and myself to take pen, ink, and paper, and each make a cross. Now, we all know how long a time it requires, and how many wearisome efforts, before the schoolboy can acquire sufficient command of his hand to make a straight stroke. The Kodji, who was a scholar, relied on this proof to enable him to discover which party had spoken the truth. As may be presumed, every attempt made by the Greek, whether large or small, produced a cross of crooked, jagged strokes, exactly similar to those in the pocketbook. This was decisive; and the sentence of the village judge, to have the culprit sent to Dimotika, to receive judgment from the governor, brought the pitiful wretch to my feet imploring for mercy, amidst the execrations of the peasants—an interesting manifestation of the moral feeling of the people, proving that a traveller even in this remote corner of European Turkey can find a court of justice in a miserable-looking village, and an upright judge in the person of a Bulgarian peasant.”

In the latter chapters of Mr. Spencer's work will be found some very interesting observations on the Hungarian revolution, and on the present state of Hungary. He describes numerous Hungarian ladies as wearing deep mourning, under a vow never to cast it off until their country's independence shall have been achieved; others wearing the national colours in the various articles of dress; and all decorated with bracelets and necklaces made from the coins issued during the government of

Louis Kossuth. He states, that whereas, when he visited Hungary in 1847, the German language was universally cultivated, in 1850 he found it as universally neglected. Everywhere he found excitement and discontent.

Had the author kept his narrative a little more distinct from his political remarks, his work would have gained, and his observations have had more force. There is much more in these well-timed volumes upon which, had we space, we should like to comment.

The world has been so be-travelled for some years back, that unless a man make a Gordon Cumming of himself, and shoot his way through wild elephants into the interior of Africa, he has scarcely a chance of seeing anything new, or alighting upon a discovery. It is true, certainly, that by perseveringly exploring the best-known parts of Europe he may come upon an uninvestigated district, and gather travellers' laurels where they were supposed to be all rooted up long ago. But untrodden fields there are now scarcely any. The title of Lieutenant Walpole's book, therefore, took us by surprise.* It seemed as if he had found out a new corner of our planet, with a new name to it. But, on second thoughts, we remem-

* *The Ansayrii; with Travels in the Further East in 1850-1851.* By Lieut. the Hon. F. Walpole, R.N. Bentley.

bered that there are sundry notices in books of geography concerning the Ansars or Ansarians, a people of Syria, reported to worship very strange gods,—the sun, the moon, dogs, and less respectable deities. Somewhere about the year 891, an old man, professing magical powers, and whose person or name nobody knew, suddenly appeared among the Syrian mountains, and persuaded everybody there that he was a very remarkable personage. He was a sort of Joe Smith, and taught a kind of Mormonism; indeed, many of the doctrines, and those the worst, of these self-constituted prophets were curiously similar. He disappeared as suddenly as he came, whether in a flash of fire, like the old gentleman mentioned in the song, or quietly sinking through a trap-door, as O. Smith (not Joe Smith) was once in the habit of doing at the Adelphi, history does not inform us. Indeed, all the information it affords about the Ansarians is of nearly as unsatisfactory a character.

This being the amount of our previous knowledge, we turned to Lieutenant Walpole's book with avidity, hoping to learn more. We cannot say that we are much the wiser for the perusal of it. The honourable traveller tells his story in so disjointed a style, mixes it up with so much irrelevant matter, and just as he has assured us that he has found out a great secret, keeps it suddenly to himself, and hints that his mind is not quite made up yet, that we feel obliged to confess our

voyage through his three portly volumes has been an unsatisfactory one. In his preface he modestly styles himself a pioneer. For taking that useful office we thank him. He has shown the way; somebody else must follow, better qualified, and do the work. Our author has been much too intent upon the charms of Ansayrian and other Eastern beauties to fulfil the severer offices of an explorer. The number of conquests of fair ones recorded in his work is really surprising. According to his own account, the havoc he made among hearts was prodigious. His portrait is appended to his first volume. We gazed upon it with curiosity after finishing the third. He is a good-looking gentleman with a beard.

Instead of being the terrible murderers that they are reported to be, Mr. Walpole found the Ansayrians very civil and hospitable. He states, that there are somewhere between sixty and one hundred thousand souls among them. He thinks that they are probably—‘perhaps’ is his word—identical with the famous Assassins. In his title-page he writes ‘Ansayrii, or Assassins,’ without a sign of doubt. The Assassins were a heretical sect of Mussulmans, holding a mixed faith, a perverted jumble of Magianism, Judaism, Christianity, and Mahometanism. They believed that their chief was inspired, and that his orders proceeded direct from God. This chief was the famous Sheik el Jebelz, the ‘Old Man of the Mountain.’ Their

first leader and legislator was Hassan Ben Sabah. They first settled in Persia, and then colonized Syria. They alarmed Christian kings, frightened Philip Augustus of France out of all royal propriety, levied black-mail upon European potentates, were baffled by the Knights Templars, and finally extinguished by the army sent against them by Sultan Bibars in the thirteenth century. Mr. Walpole does not seem to have read their recorded history sufficiently. There are good books about them in German, which he should consult before he finally makes up his mind. He has a fancy that the Ansayrii are mentioned by Pliny. If so, then what becomes of their identity with the Assassins? The passage which he quotes from Pliny does not seem to bear out the inference he draws from it.

He describes the Ansayrians as a fine, large, bony and muscular race, browner than the Osmanlee, but fairer than the Arab. Brown hair is not uncommon among them. The young women are handsome, often fair, with light hair and jet-black eyes; more rarely their eyes are light and hair black. In dress they are Turks. White is their sacred colour. The women keep retired, but do not conceal their faces, and converse freely with stranger guests. The nation musters 40,000 warriors. It is divided into two classes, sheiks and people. There are the sheiks of religion and the sheiks of government, the former mostly of good

family. The sheik of religion is a privileged person, reads and writes, is distinguished from the time he was a child, and perfected in the peculiar faith of his people as early as possible :—

“Early he is taught that death, martyrdom, is a glorious reward ; and that sooner than divulge one word, he is to suffer the case in which his soul is enshrined to be mangled or tortured in any way. Frequent instances have been known where they have defied the Turks, who have threatened them with death if they would not divulge, saying, ‘Try me, cut my heart out, and see if anything is within there.’ During his manhood he is strictly to conform to his faith ; this forbids not only his eating certain things at any time, but eating at all with any but chiefs of religion, or eating anything purchased with unclean money ; and the higher ones carry this to such an extent, that they will only eat of their own produce : they will not even touch water except such as they deem pure and clean. Then he must exercise the most unbounded hospitality ; and after death, the people will build him a tomb (a square place with a dome on the top), and he will be regarded as a saint.

“The lower classes are initiated into the principles of their religion, but not its more mystical or higher parts ; they are taught to obey their chief without question, without hesitation, and to give to him abundantly at feasts and religious ceremonies ; and, above all, to die a thousand deaths sooner than reveal the same faith he inherits from his race.”

Their houses are dirty and wretched. They have a curious custom of placing two small windows over the door, so that if a birth and death occur at the same moment, the coming and parting spirits may not meet. They practise circumcision.

They marry only among themselves. The bride meets a sorry reception from the bridegroom, for his first act is to beat her with a stick till she cries. Possibly his blows are very gentle ones. Each man is allowed four wives. There is no divorce permitted. Wives are looked upon as a kind of cattle, and not admitted to have souls, and consequently are excluded from religion. These people are honest, and to be trusted. They are lavishly hospitable. They occupy themselves in agriculture. They will not eat pork, nor the flesh of an ox or sheep that is blind or lame, nor animals shot, unless killed afterwards. They drink wine among themselves only; some tribes smoke; some allow pipes only to their sheiks. They hold Mahomet el Hamyd as the prophet of God, and believe in the transmigration of souls. Good people become stars when they die; others return to earth, and go through life again. Bad people become Jews, Christians, and Turks; and unbelievers become beasts. They pray five times a day, turning any way.

Such is an outline of the manners and ways of thinking of these curious mountaineers, as far as we can define it from Mr. Walpole's narrative. It is well worthy of the attention of ethnologists. For them indeed there is abundant material for fresh research among the very various tribes of Western Asia. Any future traveller, bent upon following in Mr. Walpole's wake, would do well to

consult some of our ethnological authorities before starting, and to read up the works of Latham especially, in order to learn what are the blanks in our knowledge, that they may fill up by using due diligence.

Our author met with a hearty reception from both sheiks and people, and more than once intimates to his readers, that he might have set up as a sort of Rajah Brooke if he had chosen. There is a gentleman in London, a man of greater acquirements than Mr. Walpole exhibits evidence of, who some years ago spent a good segment of his life playing the sheik in an Arab tribe. Business brought him back to civilization for a time: romantic recollections led him to return to his Arab subjects. But the scales had fallen from his eyes, and deceit, jealousy, knavery, and dirt, were too plainly as plentiful as good qualities among the unsophisticated Children of the Desert. He abdicated; returned to the land of his fathers for good; married a Christian wife with a soul; unwound the camel-cord from his royal brows, and shaded them with a woefully unpicturesque silk hat; and now may be met with frequently at evening parties, looking singularly unlike an ex-Arab sheik, in a grotesque dress-coat and black pantaloons. Mr. Walpole would probably have pursued very much the same course had he followed the promptings of his romantic fancy. But let him speak for himself:—

“On our entering the house of the sheik, differing only in that it was larger from the houses of the peasants, I was received with tumultuous joy. Some threw themselves on the ground, kissing my feet; sheiks kissed me all over—a ceremony more pleasing, perhaps, had it been delegated to some of the fair girls who stood wondering by. I stated my wish to pass north, through the mockattas between us and Metua; this, they said, was impossible. On my saying that perhaps they would not hurt me, I never having injured any, he said, ‘Do not trust them;’ and on my pressing the journey as one I was very anxious to perform, he said, ‘If you go, I shall accompany you with all my men.’

“A grand feast was prepared, and all who came were feasted in honour of my arrival; and the evening was passed in Ansayri theological discourse.

“At daylight I mounted, resolved to go on my journey, and determined to try the northern route, to complete my round of the mountains. The sheik accompanied me to his outer door—an honour he would not have conferred on a pasha. In compliment to him I had not mounted. On emerging from the court, I found three hundred armed men ready to accompany me, and a little way on was a still larger body. They yelled at my approach, shouting, ‘Ah Ya Bey, Eh Wallah,—blessed shall be the day; you are our banner, our holy, our father.’ I told the sheik I would rather go alone; he said, ‘If you go north, these go with you; I will not, really dare not, see you go with less.’ The demon ambition arose within me; often, often had they prayed me to come and rule among them; one word now, and they would have driven the Turks from Brummanee, and left the mountains free. But a vision passed before me; and then, ‘To Brummanee, ya Bey, to Brummanee—Ali sent you; on, on!’ I most unwillingly gave up my journey, and promised to return to Tartousa.

“The excited people grumbled at the lost fight, complaining chiefly that I would not trust them. The road

lay along the height to the south of the valley ; below all was one mass of plantations ; the houses larger and better than those generally found. All spoke of more exemption from oppression than others ; this, in fact, is a district that seldom allows any interference, nor are the taxes as regularly paid as is consistent with the good order of a government. In an hour, turned out of the valley into one lying parallel to the south, called Wady Shaloof ; the people wild and savage, far beyond any I had seen. The girls here stuck flowers in my poor horse's head till he became a species of garden ; they were thrust into my stirrups. This was one of the places I had visited on a former occasion, when I went to see a very old and holy man, who dwelt a little further south.

“It began to rain, so I put up at a village of three cottages. An old man received me most kindly ; and horses, servants, and all were accommodated beneath his roof. In the morning the rain still continued, and the road could hardly be seen ten yards off, for the heavy mountain mist. As all was ready to start, I said to the sheik's pretty daughter, a girl of twelve or fourteen, ‘Mount Ya Bint, I want you to come with me.’ At a sign from her father, she was up, and I had to defer her journey with me to a future period, when I would send for her. Her father was vexed at my rejection ; *spretæ injuria formæ* was visible in her sullen reception of my pretty apologies, and determined refusal of a present I tried to make her. However, on my whispering, ‘My wife, I order you to take it,’ she pressed my hand to her heart, put it in her bosom, and crossed her pretty hands over it.”

Besides notices of the Ansayrians, here and there the book is enlivened with a good story. The following is amusing :—

“A story was related also of Count La Borde. While among the Arabs, he saw a very fine mare which he wished

to purchase; while the bargain was going on (another was bargaining, he not speaking Arabic)—hearing a talk, the Arabs thronged round and jostled him rather rudely. He drew his sword: as quick as his ready steel flashed came forward the rummah and cobba of the Arab; he was borne back by numbers; burning with rage he plucked his head-dress (oh, shade of the unduteous son! his wig and all came too!) and he cast it amidst the crowd. They fell back in terror from this man of wondrous make. ‘*Ya wallah!* the Caffre has pulled his head off—God help us! God pardon us!’ This gave time to appease all anger; the Count replaced his wig, which had proved to him a better defence than the triple shield of Ajax or the petrifying head of Medusa; backshish, backshish, and all was forgotten.”

The reader must not suppose that these three large volumes are chiefly filled with records of travels over untrodden ground. A great portion of them is occupied with notices of well-known places. Those who have not read any recent account of travels in Syria will find enough to interest. On the whole, however, we have been disappointed with this narrative of a tour undertaken to explore a region comparatively new to research.

A careless bearing and a good coat mark the man whose fate it is to do the light duty of drawing-rooms, to make morning calls, and retail gossip. We recognize his mission at a glance, and treat him accordingly. So with books. Smart covers, large print, and wide margins proclaim the idlers of the printed world—volumes whose place is on

the drawing-room table, to give cheerfulness to its aspect, and serve to wile away an occasional lazy half-hour. In some houses none else is admitted; in others, these tomes of mere ornament are only tolerated, those of less gaudy hue and more solid substance being promoted to the place of honour in the library. Out of the latter class a few are selected for duty in the boudoir, decorated with gilding, and splendidly bound in russia,—a dignity to which our lighter friends never attain; for after their brilliancy has been dimmed by a season's exposure and display, they are dismissed, never to re-appear. Even so, fine people with empty heads, unless their outward envelopes be preserved from shabbiness, have but a fleeting spell of pomp and honours; whilst out of the crowd of sterling philosophers, some few are picked to be decorated, court-fashion, with permanent bindings of titles and decorations, and outlive whole generations of smarter courtiers, whose wrappers of cloth and golden passwords cannot, after all, bear half the wear and tear that wit and learning, combined with courtesy and good manners, can endure.

In hot climates the butterfly-books seem to thrive better than their solid brethren. A volume specially intended for Indian reading must be cooked light and served up prettily. Such an one is this about 'Life in Bombay,' respecting which life it affords but very meagre information after all.*

* *Life in Bombay and the Neighbouring Out-Stations.* Bentley.

Its contents are sadly unsatisfactory, though possibly quite as substantial as the intellectual faculties of Anglo-Indians can endure at Bombay. The writer boasts much of the refinement and intellectuality of the society there. We should have liked some better proof of the boast than his own version of it affords. The merest local gossip, mingled with incidental and fragmentary notices of scenes, manners, and customs, told listlessly and languidly, make up his account. What the Bombay folks do during the rainy season at Poona may be quoted in evidence against them and their chronicler:—

“Here are a number of people congregated together professedly for the purpose of holiday-making: the civilian is relieved from his district wanderings, the merchant from the toils and cares of business, and even the military man enjoys some relaxation from the usual routine of daily parades. The consequences are obvious; the younger officers especially, having nothing on earth to do, start off directly after breakfast on a round of visits, indefatigably collecting and carrying on the news picked up at each house, until the most marvellous knowledge of everybody’s affairs is obtained, and openly discussed in full conclave at ‘the band’ in the evening. As to any little ‘*affaire de cœur*’ going on unperceived, it is a moral impossibility; the strictest watch is always kept upon those houses in which there is a chance of meeting a young lady; and the mere circumstance of a visitor, upon his entering into a drawing-room, finding a gentleman already seated there, and who presumes to outstay him, is quite sufficient for the immediate circulation of a report that Mr. A. is going to be married to Miss B.; and forthwith such a system of espionage and quizzing commences, that in nine cases out of ten the parties are effectually frightened into reserve and

alienation, and many a promising match is thus nipped in the bud. Certain it is, that fewer marriages take place in Poona, comparatively speaking, than in the other out-stations; notwithstanding the superior extent of its society, and the many facilities it affords for the formation of intimate acquaintanceship, by the daily meetings and excursions always going on.

“The bachelor civilians are always the grand aim of manœuvring mammas; for, however young in the service they may be, their income is always vastly above that of the military man, to say nothing of the noble provision made by the fund for their widows and children. We remember being greatly amused, soon after our arrival in the country, at overhearing a lady say, in reference to her daughter’s approaching marriage with a young civilian: ‘Certainly, I could have wished my son-in-law to be a little more steady; but then it is three hundred a year for my girl, dead or alive!’”

This is but a sorry picture of the ‘highly intellectual’ society of the Bombay Presidency, nor can we find any better in any part of our author’s book. Yet a better state of things than this there must be, for it would not be difficult to cite not a few names of highly-educated and distinguished men, who are assembled at this moment either officially or otherwise at Bombay, and whose presence must have some wholesome effect upon the social arrangements there.

To turn from intellectual to physical enjoyments, woefully as we Londoners make wry faces over our tumblers of Thames water, there is some consolation in knowing that there are people in the world worse off in this respect than ourselves. The

Bombayites are forced to content themselves with brackish water, of all horrid drinks—we have tried it—the most disagreeable. When they were seized with a longing for the pure element, they made an expedition to the mystic caves of Elephanta, where, out of the black rock, amid the grim stone gods and petrified monsters, gushes, bubbling and sparkling, a living spring, cool, pure, and refreshing. But ice has now found its way in quantity into the cities of India, and iced water (*query*, iced brackish water?), unspoiled by spirituous adulterations, has become a luxurious necessity at Bombay, more valued, however, by old stagers than by new comers, as the following story testifies:—

“On one occasion, in particular, we remember dining at a small party in company with an English gentleman just arrived from China, and of course still unemancipated from the board-ship habits of taking brandy and water at night. Rather taken by surprise at the colourless appearance of the fluid which a servant was offering him, he seemed for one instant a little puzzled, but in the next a bright idea appeared to flash across his brain, and looking benignantly into the attendant’s face, he touched one of the glasses, and said, inquiringly,

“‘Milk-punch?’

“‘Na, Sahib,’ replied the man.

“The countenance of the thirsty interrogator visibly fell, but as speedily brightened as a new thought suggested itself, and with a feverish eagerness he exclaimed—

“‘Noyeau?’

“‘Na, Sahib,’ was the imperturbable reply.

“‘Then what the deuce is it?’ roared the half-frantic man.

“ ‘ Sahib, peena ka panee hy.’ (It is drinking-water, Sir.)

“ ‘ Oh !’ groaned the victim of a hopeful delusion, sinking back exhausted into his chair ; but, with an expression of irresistible fun, he soon sprang up, and accosting the lady who was next to him, politely entreated her to partake of some refreshment, after the heat and exertion of the evening ; waving his hand with an air of comic importance towards the long array of tumblers, and, as if in anticipation of her refusal, he added : ‘ Pray, don’t be alarmed, madam ; it is not by any means strong ; the refreshment consists of cold water !’ and in a similar strain he did the honours of the tray round the room.

“ But the most amusing part of the story is, that after an absence of twelve months from Bombay, we were dining on our return with the same family. Precisely as the clock struck ten, the host exclaimed—

“ ‘ Butler, bring the refreshment ;’ and to our intense delight, the summons was promptly obeyed by the appearance of the majestic Mussulman, bearing with solemn deportment his tray of cold water.”

Next to iced water, a white Christian wife is considered a luxury at Bombay,—a fact which has been turned to good account by the charitable supporters of the Byculla School, where, in addition to ordinary pupils selected from the children of the middle classes, and who pay a small fee towards the expenses, a large number of friendless orphans are educated gratuitously. The orphan boys, when they grow up, are easily provided for by ordinary methods, but for the girls there is no safe outlet except marriage. To supply these young ladies with worthy husbands, and respectable men with good wives—rare productions in India—an ingeni-

ous system is established in this excellent institution :—

“When a man in a decent rank of life wishes to marry, and can prove that he possesses the means of maintaining a wife, it is customary for him to apply to the mistress of the Byculla School, state his wishes and qualifications, and inquire into the number and character of the marriageable girls. An investigation immediately follows as to his eligibility ; and if all promises satisfactorily, he is forthwith invited to drink tea with the schoolmistress upon an appointed evening, to give him an opportunity of making his selection. The elder girls are then informed of this intended visit, and its purport ; and those who desire to enter the matrimonial lists, come forward and signify their wish to join the party. Frequently four or five competitors make their appearance on these occasions in the mistress’s room. The gentleman, while doing his best to make himself universally agreeable, yet contrives, in the course of the evening, to mark his preference for one particular lady. Should these symptoms of budding affection be favourably received, he tenders his proposals in due form on the following morning. But it often occurs, that the selected lady does not participate in the innamorato’s sudden flame ; in which case she is at perfect liberty to decline the honour of his alliance, and reserve herself for the next tea-party exhibition.

“We have known an instance when an amorous old gentleman from an out-station presented himself three successive times at these ‘soirées,’ in the hope of obtaining a wife to cheer the solitude of his up-country residence ; but all in vain : the young ladies unanimously rejected him with the highest disdain, wondering ‘how such an ugly old fellow could have the impudence to think of a wife.’ But a very different reception is given to the dashing young sergeant or smart-looking conductor : their attentions are never repulsed, and the announcement of the ‘chosen in-

tendeds,' as Miss Squeers would say, is anticipated with the utmost impatience by many an anxious young heart. The wedding speedily follows, the bride's modest 'trousseau' being provided from the funds of the establishment, and every girl in the school cheerfully contributing her aid in the manufacture of the dresses."

Some pretty lithographs of Indian scenery, printed in colours, decorate this handsome volume, which, whatever may be the value or interest of its contents, is very prettily and tastefully got up.

The fact of a third edition of this entertaining volume is evidence sufficient to show that recent attempts to "take the shine out of" the East have not been made in vain. Titmarsh, president of cosmopolites, and Smith, prince of Cockneys, have not tilted at the rising sun without tarnishing his splendour and damaging his tinsel face.* The crescent had been so bepraised that stay-at-home travellers waxed cross about it, and the unlearned inquired into the true signification of Eōthen with something very like incipient disgust. John Bull began to grow jealous of the raptures lavished upon bulbuls, minarets, giaours, nargelis, yashmaks, scheiks, *et id genus omne*; and surlily hinted that Stamboul is an imposition, and the Sublime Porte not nearly so good as even hotel port at home. The live pashas who visited him occasionally did not tend to dissipate his rising suspicions. When

* *A Month at Constantinople.* By Albert Smith. Bogue.

a great many folks had made the Overland Journey, the storm began to burst upon the devoted "Land of the Sun." People would "smile on the deeds that his children have done" no longer. Old Indians, from the still farther East, and who had fondly cherished the paradoxical impression that a real eastern Eden lay somewhere to the west of them, tried in vain to catch a glimpse of its charms on their way through Egypt homewards; but what they saw looked so like a mixture of Hindoo and European, that they abandoned all faith, and, soured by disappointment and a bad liver, diffused their disparagement of everything Oriental through every nook and corner of the land. Monckton Milnes himself could not mollify them; and though many reckless old bachelors were delighted with the respectable view, promulgated by that illustrious poet, of hareems and palm-trees, the tide of discontent flowed unimpeded. The more romantic adhered, and many still adhere, to Eliot Warburton and Kinglake, whose admiration, bottled and fermented for British use, had cast down the unpoetic sediment with which, when first concocted, it had unquestionably been mingled, and, by keeping, had acquired a champagne-like sparkle and flavour. But the invading army of modern crusaders who, availing themselves of the Levantine lines of steam-packets, poured forth, under the guideship of Murray, upon Athens, Constantinople, Smyrna, Jerusalem, and Cairo, with the 'Corsair,' the 'Giaour,'

the 'Bride of Abydos,' and 'Lamartine's Travels' in their carpet-bags, their moustaches cultivated to captivate Turkish dames, their pistols charged to annihilate Greek klephtis, returned woefully disappointed to the land of their fathers. They joined with Titmarsh in denouncing Turkish palaces as so many "Vauxhalls by daylight," albeit not a little puzzled by the under-current of sentiment and fine feeling that mingles alike with Titmarsh's bitterest and merriest quizzings. In Smith they found their true spokesman and representative. He saw the East as they saw it. To them, as to him, it was a bad imitation of London, without the charms of our beautiful and sunny metropolis. The Bosphorus was but a bit of the Thames, and Prinkopo an indifferent Gravesend; St. Sophia a poor imitation of St. Paul's; the bazaars a little more eastern in character, being most like the *baragues* at Boulogne fair. Like Smith, they called for bitter ale everywhere—and got it. They were right. The wine is very bad in the East, and the brandy detestable. Yet we question whether a recollection of the number of times and multitude of places rendered memorable by the imbibition of bitter ale, be the most appropriate "Souvenir de l'Orient," even for a British traveller.

Yet, if an eminent and facetious author, with the poetry out of him, visits the East economically, treating himself by the way to "strawberries and milk, and cannon for echo," for the small charge

of one franc ; enjoying his ' Illustrated News ' at Constantinople, purchasing his beloved pale ale at Alexandria, and laying out forty-three piasters on a " Dutch cheese, some mutton, milk and eggs, and impossible sundries," on the Nile, no one has a right to object, although our traveller prints a book about it. And if his book be a good one in its way, although its plan and purpose be to prosify the East, we should be thankful, and moderate our ire—for good books are scarce. Every now and then we meet with an imaginative man, who naïvely and honestly opens out his indignation against what he terms the humbug of things. There is a freshness in his fashion of looking at pretty objects with their wrong ends upwards, that for the moment compensates for his invasion upon our cherished and traditional fancies. Such a man would revel in a ' Month at Constantinople ' with Albert Smith, and gladly go shares for six weeks more.

After all, there *is* poetry about the East, in spite of Smith. We are old Easterns. We have experienced much that he has expressed, and grant that the enthusiasm got up by travellers about the East is often forced. We agree with him in refusing to cast a glow of romance over rags and dirt and pinchbeck in Turkey, at which we would scorn to look in England. We know that the Turks are as prosaic a people as the Saxons, that the Greeks are the most mercenary pack of knaves in Europe. Yet, though Turks are dull and Greeks dishonest, both are picturesque, and live under a brighter sun

and a bluer sky than ours. The charm with which the sunshine of the East invests tumbling hovel, mouldering barrack, and evergreen tree, is not to be slighted. Nor are the traditions of the East to be set aside unceremoniously because they are old tales now. A man may be neither a profound Greek nor Oriental scholar, and yet carry with him many a cherished recollection of classical story. The dreams of our boyhood, the memories of our school-days, even though our education may not have been of the most scholastic cast, are revived at every turn; and many a long-buried recollection of the past is called to life again as we gaze on the Acropolis and sail past Ægina. Many a man of whom nobody hears wends his way eastwards in these days of steam and cheap travelling, whose knowledge of Hellenic antiquities and ancient history is entirely derived from the 'Penny Cyclopædia' and popular magazines. Yet is his delight at visiting Marathon and at gazing on Delos as full and unaffected as that of the most accomplished scholar. There is enough of truth in the romance of the East to counterbalance all the sham raptures of would-be enthusiastic tourists. There are traces of a glimmering sense of this even in the narrative of a 'Month at Constantinople.' Be that as it may, after reading this third edition and the preface to the second, we deliberately hold as our conclusion—one directly opposed to that of Albert Smith—that there is a great deal more poetry than bitter beer in the Levant.

III.

ENGLAND AND HER SURVEYING EXPEDITIONS.

It is but right that Britannia, since she claims to rule the waves, should take upon herself the office of surveying the seas, and of furnishing trustworthy charts for the guidance of mariners through every part of her aquatic empire. It is but just to give her due praise for having fulfilled this humane duty, and for never tiring in her exertions for the extension of our knowledge of the ocean. Generously and without grudge, she freely offers the results of her hydrographical labours for the benefit of all the world besides. Whatever may have been the sins of the Admiralty in other respects, the good deeds of that branch of government in the promotion of marine surveying, are too many and eminent not to call for the warmest praise and admiration. Scarcely a year passes without fresh expeditions being planned or sent forth to investigate unexamined or partially known regions; and we may confidently look forward to a constant succession of them, until not a nook or corner of the

sea remains undelineated. No man living understands more completely in every respect the bearing and importance of such inquiries than Sir Francis Beaufort, the eminent officer who presides over the hydrographical department.

Well may England be proud of the surveying labours of its navy, when it remembers among her living officers, besides the illustrious admiral whose name we have just mentioned, Smyth, King, Beechey, Belcher, Graves, Stokes, Blackwood, Kellett, and many others, who have not merely conducted or commanded expeditions with success, but have personally, and by their own zeal for science, materially extended the bounds of human knowledge. We might quote numerous worthy successors to them among surveying officers now afloat and on duty; and may confidently appeal to the transactions of our scientific and antiquarian societies, for written evidence of the enlightened studies and able researches of British naval officers.

The expedition of which these volumes contain a lucid and entertaining account, sailed from Spithead, in December, 1846, with the main object of completing the survey of Torres Strait, and exploring the sea between the Barrier Reefs, New Guinea, and the Louisiade Islands.* It was placed under

* *Narrative of the Voyage of H.M.S. Rattlesnake, commanded by the late Captain Owen Stanley, R.N., F.R.S., etc., during the years 1846-1850.* By John Macgillivray, F.R.G.S. T. and W. Boone.

the command of Captain Owen Stanley, a zealous and accomplished officer, who thoroughly appreciated the scientific importance of the opportunities thus afforded him. We remember well the enthusiastic anticipations of discovery, and hopes of usefulness to natural history science, expressed by him before he left his country to return no more. Mental anxiety and the cares of his responsible post brought on a fatal illness when he had ably completed the main portion of his task. He inherited scientific tastes from his father, the late venerable Bishop of Norwich. The most important practical result of his labours was the discovery of a clear channel, of at least thirty miles in width, along the southern shores of New Guinea and the Louisiade Archipelago, stretching east and west between Cape Deliverance and the northern entrance to Torres Strait—a distance of about 600 miles. Vessels will now be enabled to approach these shores with safety, and run along them by day or night, under the guidance of the chart, without fear or risk. A new field for whaling enterprise is thus opened. Although New Guinea, fertile as that great island would appear to be, does not hold out at present many prospects for commercial communication, yet there is every probability of the presence in it of stores of rich mineral wealth. Grains of gold were found in the pottery procured from the natives, and which was probably made from the clay of the extensive alluvial deposits forming the banks of rivers

flowing from the great 'Owen Stanley' chain of mountains, of the existence of which we have been made acquainted by Lieutenant Yule and Captain Stanley, and including many summits of from 6000 to above 13,000 feet in elevation. What a vast untrodden field for discovery—what a new store of natural history treasures, and a new region for geological research, is thus promised to reward the toils of future travellers! Indeed, there is no spot on the earth's surface, of anything like equal extent, so wholly untrodden as the interior of New Guinea, and so sure to be fruitful in results to the explorer. Great rivers, great mountains, great plains, fertility, variety, and isolation—all combine in this enormous island to render it a magnet of attraction for the adventurer who seeks to gather virgin laurels. The inhabitants, it is true, are fierce and dangerous; but they are intelligent in their way, and, after more intercourse with white men, may prove aids rather than impediments to research.

In accounts of travels through countries where an important part in the history of the past has been played by their inhabitants, antiquarian researches give an interest and animation to the narrative, which would be altogether wanting in the tale of exploration amid savage regions and tribes, were there not ethnological investigations to supply a similar element of attraction. Ethnology is every day becoming more and more defined and scientific.

The paths sketched by Prichard are undergoing a searching survey by Latham, who, like his predecessor, combines physiological and natural history knowledge with philological learning—a rare union of acquirements, absolutely necessary for any man who aspires to generalize on the natural history of the human race. The philosophical ethnologist must rejoice when he obtains materials for his comparisons from observers so qualified for the task as Mr. Macgillivray, who worthily follows up the valuable work done amid the same or neighbouring ground by his former colleague, Mr. Jukes, when accompanying Captain Blackwood during the surveying voyage of the 'Fly.' The question upon which the ethnological matter contained in these volumes throws most light, is the important one of the nature of the relations that can be traced between the people of New Guinea and those of Australia—whether the races of these enormous isolated lands are linked by the tribes of the intermediate islands, and in what manner can we account for the great peculiarities and degraded moral and physical features of the Australian aborigines. The people of New Guinea best known hitherto, and upon whom most stress has been laid, are the Papuans,—black or dark-brown people, mostly rough-skinned, and having crisp and frizzly hair. Of the Harfours and Arfaki, two other reported New Guinea races, the accounts are very contradictory. Captain Stanley and his companions met with none

of these last tribes, nor any people answering to the descriptions of them. All the natives they saw in the Louisiade Archipelago and on the south-east coast of New Guinea were Papuans, and Mr. Macgillivray agrees with Prichard in considering them a genuine and peculiar tribe:—

“It appears to me that there are two distinct varieties of the Papuan race inhabiting the south-east portion of New Guinea. The first occupies the western shores of the Great Bight, and probably extends over the whole of the adjacent country, along the banks of Aird river, and the other great fresh-water channels. Judging from the little that was seen of them during the voyage of the ‘Fly,’ these people appear to agree with the Torres-Strait islanders—an offshoot, there is reason to believe, of the same stock—in being a dark and savage race, the males of which go entirely naked.

“The second variety occupies the remainder of the south-east coast of New Guinea and the Louisiade Archipelago. Their characteristics have already been given in this work, as seen at the intermediate points between Cape Possession and Coral Haven; they agree in being a lighter-coloured people than the preceding, and more advanced in civilization: mop-headed, practising betel-chewing, and wearing the breech-cloth.”

The first vocabulary ever obtained in the Louisiade Archipelago is due to our voyagers. It contains words that are common to the languages of the inhabitants of the north coast of New Guinea on the one hand and New Ireland on the other, and also to the Malay and the various Polynesian languages or dialects spoken from New Zealand to Tahiti. Yet, whilst we have thus a distinct affinity

indicated between the woolly and straight-haired sections of Oceanic blacks, the language of the Louisiade “differs completely from that of the northern part of Torres Strait,” though the people are strongly similar, both physically and in certain manners and customs. The Louisiadians are distinctly derived from the eastern coast of New Guinea. The islanders of Torres Strait are also genuine Papuans, except the people of the Prince of Wales Islands, which are inhabited by the Kowrarega blacks. These Mr. Macgillivray was at first inclined to regard as degraded Papuans. But the results of his more complete researches, and of Dr. Latham’s elaborate analysis of their language, coincide in determining the Kowraregas to be an Australian tribe, altered physically, intellectually, and morally, by contact with Papuans. They have advanced by acquiring from their neighbours the art of cultivating the ground, and of constructing and navigating large canoes; retaining the use of the spear and throwing-stick, and practising ceremonies peculiar to the Australian race; holding, too, their females in degradation, whereas the Papuans treat women with respect. All Australia is inhabited by a unique race, physically and philologically one. Except in the instance of the Kowrarega tribe, there is nothing like a passage of the North Australians into the people of the other side of Torres Strait; and in that instance the approach is only apparent, not one of true affinity. Whence,

then, have they been derived? Prichard, Latham, and Macgillivray, in their respective works, incline to the belief that their line of migration was from Timor. This opinion remains purely conjectural. But in Dr. Latham's appendix upon the Louisiade language, contained in the work before us, an unexpected and significant fact comes out. The collation of what is known of the languages of the islands between New Ireland and New Caledonia, with the Louisiade dialects, indicates close affinities. Now the New Caledonian was formerly shown by the same acute ethnologist to have affinities with the language of Van Diemen's Land, apparently even closer than those of the latter with the Australian tongue. Physically, too, the Tasmanian approaches the New Caledonian. Has the difference between the Tasmanian and the Australian been exaggerated? Our data for judging of the former are very imperfect. Is it not just possible that the Australian may be a degraded Tasmanian, and that the line of migration of the race has been, during its later course, from south to north, instead of from north to south?—so that instead of expecting to find evidences of near affinity between the races of New Guinea or of the Indian islands, and the people of north-east Australia, we should look for what is the case, the greatest amount of physical and philological difference at the point of proximity. We offer this suggestion merely as an hypothesis worthy of con-

sideration. The case might be paralleled in the instance of the relations between the Esquimaux and the Indians of north-eastern America, as interpreted with the highest degree of probability by Dr. Latham himself.

Much new and curious information respecting the manners and customs of the aborigines of north-east Australia was obtained by Mr. Macgilivray, partly through a young white female, Barbara Thomson, the wife of the owner of a shipwrecked vessel, of which all the crew were lost in Torres Strait. This woman was saved by the natives, and taken possession of by one of them, and afterwards brought back to civilized life by the 'Rattlesnake.' A singular superstition secured her protection. All the Australian blacks believe that white people are the ghosts of aborigines—"when black fellow die, he jump up white fellow." An influential member of the tribe among whom Mrs. Thomson fell, fancied that he recognized in her the ghost of a long-lost daughter named Gi'om, and adopted her accordingly. "Frequently when the children were teasing Gi'om, they would be gravely reproved by some elderly person telling them to leave her, as, 'poor thing! she is *nothing*,—only a ghost!'" At Cape York, the same word is used to signify a white man and a ghost. The following custom is very remarkable, when we consider that no use is made of property in land:—

"It seems curious to find at Cape York and the Prince

of Wales Islands a recognized division and ownership of land, seeing that none of it by cultivation has been rendered fit for the permanent support of man. According to Gi'om, there are laws regulating the ownership of every inch of ground on Múralug and the neighbouring possessions of the Kowraregas; and I am led to believe such is likewise the case at Cape York. Among these laws are the following. A person has a claim upon the ground where both himself and his parents were born, although situated in different localities. On the death of parents their land is divided among the children, when both sexes share alike,—with this exception, that the youngest of the family receives the largest share. Marriage does not affect the permanency of the right of a woman to any landed property which may have come into her possession. Lastly, an old man occasionally so disposes of his property that a favourite child may obtain a larger proportion than he could afterwards claim as his inheritance."

Among the Kowrarega tribe, Gi'om stated, that when the head of a family dies, the body is laid out on a framework of sticks, raised a foot from the ground, and there suffered to rot. The nearest relative watches it in a hut near the corpse, until the head drops off, when that member is handed over to the charge of the dead man's eldest wife, who carries it about with her in a bag during her widowhood.

To the intelligence of the native Australians Mr. Macgillivray bears strong testimony, and illustrates his opinion by an interesting account of a native friend :—

"Many of the Port Essington natives have shown a remarkable degree of intelligence, far above the average

of Europeans, uneducated, and living in remote districts, —among others, I may mention the name of Neinmal (the same alluded to in the preceding paragraph), of whose character I had good opportunities of judging, for he lived with me for ten months. During my stay at Port Essington he became much attached to me, and latterly accompanied me in all my wanderings in the bush, while investigating the natural history of the district, following up the researches of my late and much lamented friend Gilbert. One day, while detained by rainy weather at my camp, I was busy in skinning a fish: Neinmal watched me attentively for some time, and then withdrew, but returned in half an hour afterwards, with the skin of another fish in his hand prepared by himself, and so well done too, that it was added to the collection. I could give many other instances of his sagacity, his docility, and even his acute perception of character; latterly, he seemed even to read my very thoughts. He accompanied me in the 'Fly' to Torres Strait and New Guinea; and on our return to Port Essington, begged so hard to continue with me, that I could not refuse him. He went with us to Singapore, Java, and Sydney, and from his great good humour became a favourite with all on board,—picking up the English language with facility, and readily conforming himself to our habits and the discipline of the ship. He was very cleanly in his personal habits, and paid much attention to his dress, which was always kept neat and tidy. I was often much amused and surprised by the oddity and justness of his remarks upon the many strange sights which a voyage of this kind brought before him. The 'Nemesis' steamer under weigh, puzzled him at first: he then thought it was 'all same big cart, only got him shingles on wheels!' He always expressed great contempt for the dulness of comprehension of his countrymen: 'Big fools they,' he used often to say; 'black fellow no good.' Even Malays, Chinamen, and the natives of India, he counted as nothing in his increasing admiration of Europeans, until he saw

some Sepoys, when he altered his opinion a little, and thought that he too, if only big enough, would like to be a soldier. The poor fellow suffered much from cold during the passage round Cape Leeuwin, and was ill when landed at Sydney, but soon recovered. Although his thoughts were always centred in his native home, and a girl to whom he was much attached, he yet volunteered to accompany me to England, when the 'Fly' was about to sail; but as I had then no immediate prospect of returning to Australia, I could not undertake the responsibility of having to provide for him for the future. I was glad then when Lieutenant Yule, who was about to revisit Port Essington, generously offered to take him there: while in the 'Bramble' he made himself useful in assisting the steward; and, under the tuition of Dr. MacClatchie, made some proficiency in acquiring the rudiments of reading and writing. At Port Essington, the older members of his family evinced much jealousy on account of the attention shown him, and his determination to remain with Mr. Tilson, the assistant-surgeon, then in charge; and endeavoured to dissuade him from his purpose. While upon a visit to his tribe, he met his death in the manner already recorded. His natural courage and presence of mind did not desert him even at the last extremity, when he was roused from sleep to find himself surrounded by a host of savages thirsting for his blood. They told him to rise, but he merely raised himself upon his elbow, and said, 'If you want to kill me, do so where I am; I won't get up: give me a spear and club, and I'll fight you all, one by one!' He had scarcely spoken, when a man named Alerk, speared him from behind; spear after spear followed; and as he lay writhing on the ground, his savage murderers literally dashed him to pieces with their clubs. The account of the manner in which Neimnal met his death was given me by a very intelligent native, who had it from an eye-witness; and I have every reason to believe it true, corroborated as it was by the testimony of others."

Mr. Macgillivray is strongly in favour of the establishment of a great or small settlement at Cape York, and offers arguments in support of his opinion, which, supplementary as they are to others urged formerly by Mr. Jukes, seem to us to make out a case well deserving the attention of the Colonial Office.

The accounts of the Louisiade and New Guinea people met with during the expedition are highly interesting. The dress and decorations of the natives of Coral Haven were noticeable, especially for an ornament that we do not remember to have heard of before:—

“The ornaments worn by these savages are very numerous, besides which, they are fond of decorating the person with flowers and strong-scented plants. In what may be considered as full dress, with the face and body painted, they are often decked out with large white cowries, appended to the waist, elbows, and ankles, together with streamers of pandanus leaf. Among many kinds of bracelets or armlets, the most common is a broad woven one of grass, fitting very tightly on the upper arm. There are others of shell,—one solid, formed by grinding down a large shell (*Trochus Niloticus*), so as to obtain a well-polished transverse section; and another, in two or three pieces tied together, making a round, smooth ring: of the former of these, five or six are sometimes worn on one arm. But the most curious bracelet, and by no means an uncommon one, is that made of a human lower jaw, with one or more collar-bones closing the upper side, crossing from one angle to the other. Whether these are the jaws of former friends or enemies we had no means of ascertaining; no great value appeared to be attached to them;

and it was observed, as a curious circumstance, that none of these jaws had the teeth discoloured by the practice of betel-chewing."

The villages of the people at Brierly Island are remarkable for cleanliness and the absence of everything offensive. Here, too, bananas and yams are cultivated and pigs reared, so that there is much comfort among these savages. The most promising indication of capacity for civilization, however, shown by the New Guinea people is their treatment of the fair sex:—

"Yesterday and today, in addition to upwards of a hundred natives alongside bartering, we were honoured with visits from several parties of the Tassai ladies, in whose favour the prohibition to come on board was repealed for the time. The young women were got up with greater attention to dress and finery than when seen on shore, and some had their face blackened as if to heighten their attractions. The outer petticoat, worn on gala days, such as this, differs from the common sort, in being much finer in texture and workmanship, besides being dyed red and green, with intermediate bands of straw-colour and broad white stripes of palm-leaf. It is made of long bunches of very light and soft shreds, like fine twisted grass, apparently the prepared leaf of a calamus or rattan. None of the women that I saw possessed even a moderate share of beauty (according to our notions), although a few had a pleasing expression, and others a very graceful figure; but, on the other hand, many of the boys and young men were strikingly handsome. We had no means of forming a judgment regarding the condition of the women in a social state; but they appeared to be treated by the men as equals, and to exercise considerable influence over them.

On all occasions they were the loudest talkers, and seemed to act from a perfect right to have everything their own way. It is worthy of mention, that, even in their own village, and on all other occasions where we had an opportunity of observing them, they acted with perfect propriety; and although some indecent allusions were now and then made by the men, this was never done in the presence of the women. Of their marriages we could find out nothing: one man appeared to have two wives, but even this was doubtful. The circumstance of children being daily brought off by their fathers to look at the ship, and the strange things there, indicated a considerable degree of parental affection."

The author of this well-written narrative was attached officially to the expedition as naturalist. Some of the results of his labours are described in valuable appendices to the work. How admirably and efficiently he fulfilled his task our national museums can show. A more able observer and more diligent collector could not have been selected for the duty. The assistant-surgeon of the expedition, Mr. Huxley, also laboured assiduously in the cause of zoological science; and some of the most remarkable of recent memoirs on invertebrate animals have been produced by that gentleman in consequence, and printed by the Royal Society in the 'Philosophical Transactions.' We hope the Admiralty will not allow the numerous scientific results, as yet unpublished, of this voyage of the 'Rattlesnake' to lie dormant. Rarely has any of our voyages of discovery brought home so much new matter. The volumes now before us are well

illustrated, full of interest, and sure to command the attention they deserve from the public.

The surveying voyages of British navigators are always sufficiently prolific in discoveries to furnish solid matter for standard volumes, and not unfrequently combine with hard work a sufficient amount of adventure and risk to render the narrative of them interesting.* Famous as our navy is for its exploits in war, it is equally famous for its services in the cause of peace and knowledge. The fruits of the labours of a well-conducted surveying expedition are of more value to the world than a thousand brilliant sea-fights. The glory of battles astonishes and delights the vulgar; but as men advance intellectually, they honour in preference the conquests of peace. The hero will always be remembered if he be of the foremost of warriors, but his fame is brief if he be but second in the race for glory, however loudly his praises may have been sounded at the moment of his martial deeds. A Nelson will always stand out vividly in the memory of his countrymen and his foes; but your inferior commanders are forgotten, or chronicled in prosy records, seldom read. Not so with explorers. Whilst Cook will stand conspicuously on a pedestal

* *Narrative of the Voyage of H.M.S. Herald during the years 1845-51, under the Command of Captain Henry Kellett, R.N., C.B.* By Berthold Seemann. Lovell Reeve.

beside Nelson, many a hardy and intelligent navigator will be borne in mind besides Cook. The names of discoverers are linked with the onward march of civilization, and they will be household words in regions that sooner or latter will play a part in the world's development. One of the truest sources of British pride is the lion's share our navy has had in oceanic discovery. The officer who affects to slight the surveying service has but a mean appreciation of the true dignity of his profession; and the Admiralty Board which would cripple the resources and impede the progress of this valuable department, must be singularly deficient in foresight, as well as in enlightened patriotism. Fortunately a wiser spirit may be expected to sway the counsels of those upon whom the advancement of this branch of national honour depends.

The conductor of the voyage of which the narrative is before us, is at present amid the Arctic seas, seeking for Sir John Franklin and his brave companions. Captain Henry Kellett—we may speak out in his praise whilst he is absent—is a thorough specimen of a brave and enlightened British seaman. Throughout the expedition which he commanded, and which lasted for six years, he never ceased to promote the cause of science, and was rewarded with abundant fruits. Fully appreciating the value of natural history researches, he did all that lay in his power, and his brother

officers followed his example, to aid in furthering the work of the professional naturalists by whom he was accompanied. Ample collections were made, accounts of which are now in course of publication in a separate work. Captain Wood, who commanded the 'Pandora,' the consort of the 'Herald' during the first part of her labours, equally did his utmost to contribute to the stores of science.

Captain Kellett, on leaving England, was accompanied by a promising and talented naturalist, Mr. Thomas Edmonston, who, though but a youth, had already given good earnest of his powers and love for science in a 'Flora of the Zetland Isles,' his native country, and in several papers on various botanical and zoological subjects. We remember well the zeal and delight with which this young genius—for such he assuredly was—entered upon a mission so suitable to his talents and tastes, and so likely to prove prolific in discovery. Alas! all these hopes and anticipations were fated to be destroyed. Mr. Edmonston met with an early and awfully sudden death. He was shot by accident when returning from his work, whilst the 'Herald' was anchored off the river Sua, in the Bay of Atacamas. We could have wished that more use had been made in these volumes of his letters, notes, and journals, since the notices of the earlier labours of the expedition, before Mr. Seemann joined it as successor to Mr. Edmonston, are scanty. Mr. Seemann has, however, done his own share of the

work well, and described all that he witnessed with great clearness and vivacity. He was appointed naturalist to the expedition at the suggestion, we believe, of Sir William Hooker,—a strong recommendation, for experience has shown that the nominees of the illustrious botanist of Kew have always proved to be men thoroughly qualified for their office.

The first part of the narrative is occupied by an account of the voyage out, and of the Pacific coasts of America, both north and south, with the Isthmus of Darien, surveyed by the expedition. It contains many interesting notices of the scenery and productions of the shores of the Pacific Ocean. On several occasions Mr. Seemann made excursions into the interior, and visited tracts of the country seldom explored by travellers. A journey of peculiar interest was that from Payta across the Peruvian desert, and on through the republic of Ecuador to Guayaquil. The following trace of ancient Peruvian customs is worthy of notice :—

“We were forced to remain a day at Sasaranga, our Peruvian muleteers having left us, and fresh animals not having been caught. The mode of travelling in Ecuador is peculiar. On the principal roads, at every six or eight leagues, there are *tambos*—buildings for the reception of travellers; at each of them a *tambero*, or innkeeper, is stationed, who is appointed by Government, and whose duty is to assist in loading and unloading, to fetch fuel, water, and provisions, and procure animals for the journey, and a cook: for his trouble he receives one real a day from each party, and the cook half a real. The price for each ani-

mal, whether horse or mule, is four reals from one *tambo* to another. While in Ecuador we always availed ourselves of this institution; and, although in many places great disorder and slowness prevail, it proved on the whole highly advantageous. The *tambos* originated in the time of the Incas; they were the post-stages where the royal messengers met, and delivered to each other the mysterious *quipos*. The communication was at that time so well kept up, that the kings, at their table at Cuzco, had fish fresh from the sea daily. The descendants of these messengers are still pointed out; and we have had occasion to observe the swiftness with which some of them would keep pace with our animals for leagues together."

In Darien, on the banks of the river Cupica, vast groves of vegetable ivory,—a species of the genus *Phytelephas*, probably distinct from that found on the Magdalena,—were met with. The Darien kind is always collected in separate groves, growing gregariously and unmingled with other trees, or even herbs, the ground beneath these palms (or rather screw-palms) being as bare as if it had been swept. The flowers of both male and female trees are exceedingly odorous, emitting a scent like that of almond-essence, and attracting swarms of bees. The fruits are aggregated in heads, each plant bearing from six to eight of these masses of drupes at one time. On an average each head contains eighty seeds, and when ripe weighs about twenty-five pounds. No use is made of them however, although they might be turned to excellent account; and we call the attention of speculators to this discovery, as one of considerable

commercial interest—the more so since at present much attention is being directed towards the products and resources of Darien. Several tribes of Indians inhabit the Isthmus, each speaking a different language and quarrelling with its neighbours. Of one of these tribes the following account is curious:—

“The Savaneries occupy the northern portion of Veraguas, and appear to be most numerous in a district situated a few days’ journey from the village of Las Palmas. One of their chiefs has adopted the pompous title of King Lora Montezuma, and pretends to be a descendant of the Mexican Emperor conquered by Cortez; almost every year he sends ambassadors to Santiago, the capital of Veraguas, to inform the authorities that he is the legitimate lord of the country, and that he protests against any assumption on the part of the New-Granadian Government. These ambassadors, who appear in mean dresses, and make known their mission in broken Spanish, are generally treated with ridicule. Although no credit can be attached to the assertion of King Lora that he is a descendant of the great Montezuma, yet there is reason to suppose,—and future investigations may tend to corroborate the supposition,—that his subjects are a remote branch of the great family of Anahuac. Direct intercourse existed at the time of the discovery between the southern portions of the Mexican empire and Veraguas; little eagles, the national emblem of Mexico, are frequently met with in the tombs of the district; and chocolate is still the prevalent drink. Such facts are, in themselves, important enough to draw upon this tribe the attention of the ethnologist. Unfortunately, no European has as yet had time to study it; and the Spanish inhabitants are too indolent, and, it may be added, too much prejudiced against the Indians, ever to arrive at correct conclusions, or to make proper use of the rich ma-

terials scattered around them. How they reason may be inferred from the following. A gentleman, more intelligent than the generality of his countrymen, said, 'The very fact that that Indian takes the name of Lora, that of a parrot, is sufficient to show what a man he must be.' I told him however that 'Lora,' in the language of the natives, might have an entirely different signification, and that the mere similarity of sound was no proof of identity of meaning; and that the proceedings of this Indian chief looked so business-like, that, in my opinion, he must either be himself a superior man, or must have some European counsellor to direct his movements."

The second part of the narrative is mainly devoted to an account of the voyages of the 'Herald' to the Arctic regions, through Behring's Strait, whither Captain Kellett was directed to proceed in order to unite with H.M. brig 'Plover,' in searching for the lost expedition under Sir John Franklin. Although no trace of the objects of the search were encountered, geographical discoveries were made of no small consequence. It was during this voyage that the southern extremity of the Polar land, long reported to exist by the Russians, was discovered and fixed on the map. North of Herald Island, a mountainous and almost inaccessible mass of granite, in lat. $71^{\circ} 20'$ north, and long. $175^{\circ} 30'$ west, a high and far-extending land was seen. Very interesting researches were conducted respecting the natural history of Western Eskimoland; and Mr. Seemann gives full notices of the people of that region, who seem to be a race of highly respectable semi-savages, by no means so

diminutive as is generally supposed : indeed, in the southern parts some of the men are said to be full six feet in height :—

“ Their faces are flat, their cheek-bones projecting, and their eyes small, deeply set, and, like the eyebrows, black. Their noses are broad ; their ears are large, and generally lengthened by the appendage of weighty ornaments ; their mouths are well formed, their lips are thin, and, in the men, distorted by large beads or circular ivory labrets, protruding from diagonal cuts under them. These labrets correspond in shape and size with those formerly in use among the ancient Mexican warriors. This fact might be considered merely as one of those curious coincidences so frequently met with among nations widely separated from each other, if there were not another consideration more important. During the winter—by far the greater portion of the year—the Eskimos are frequently obliged, on account of the excessive cold, to take them out. From this it would appear that the custom could not have originated in the frigid zone, although it may have been retained after having been once adopted. We know that the Aztecs came from the north, and are able to trace them with tolerable accuracy to about the latitude of the Straits of Juan de Fuca ; we may therefore well ask, May not the Eskimos have come from the same quarter, or at least have adopted the custom when living in milder regions ? In Mexico the labrets were worn only by the soldiery ; among the Eskimos they are in use with the men indiscriminately : but in the society of the former the warriors constituted a separate class ; among the latter every one exercises that office. Their very name, *Innuït* (man), shows the estimation in which they hold themselves. The fact also that the labrets are only worn in Western Eskimo-land is deserving of consideration.”

The speculation of the narrator concerning the line of migration of the Esquimaux race is not a

very happy one, and would seem to indicate that his familiarity with the writings of the more learned ethnologists is but slight. Of the conubial habits of the Western Eskimos we have a brief notice:—

“The mode of marriage is curious. When a man has fixed upon his choice, he proceeds to the girl’s mother, and asks at once for the daughter’s hand: if the mother is satisfied that he can support a wife by the produce of the chase, and besides has nothing objectionable, she gives her consent. The bridegroom then gets a complete suit of clothing, and tenders it for the girl’s acceptance; the bride takes it to her mother, and, returning dressed in it, is considered his wife. In the same manner two men sometimes marry the same woman—a custom which seems to have its origin in the paucity of the softer sex. After the marriage ceremony has been performed infidelity is very rare.”

There are several passages of much interest concerning countries visited on the voyage homewards. The heavy and slow quizzing of the St. Helena people, extracted from the pages of Mr. Lockwood’s ‘Guide,’ might however have been omitted with advantage. Wherever Mr. Seemann touches, he collects botanical information of consequence, and fully appreciates the value of vegetable economics. At Singapore he made inquiry respecting the gutta-percha tree, and confirms the statements that have been made about its rapid destruction and probable ultimate scarcity. It takes ten trees to yield one picul, *i. e.* 133 $\frac{1}{3}$ lbs. of solid gutta. Now since between January, 1845, and the middle of 1847, no fewer than 6918 piculs were sent from

Singapore to Europe, the vast number of 69,180 trees must have been sacrificed! Since 1847 the use of this valuable substance has greatly extended. Its true name is 'gutta taban,' not 'gutta percha,' which is a distinct substance, and the product of an unknown tree.

Mr. Petermann has contributed an excellently drawn-up summary of the results of the several expeditions that have been conducted in search of Sir John Franklin, and there is an appendix containing nautical directions by Captain Trollope. Altogether these volumes are highly creditable to their author and to the expedition to which he was attached.

The British Navy, glorious as have been its triumphs in war, can proudly and justly boast of its conquests in the realms of science. The lists of our scientific societies contain not a few names of our naval officers; and among them are many who can lay indisputable claims to the designation of philosopher. Not a few of these have acquired their scientific tastes when attached to the hydrographical branch of the service; and among them there is none more eminent than the author of this welcome work on the Mediterranean.* Admiral Smyth is at once one of the most distinguished

* *The Mediterranean.* By Rear-Admiral William Henry Smyth, K.S.F., D.C.L., etc. John W. Parker and Son.

of living hydrographers, of astronomers, and of antiquaries. Men like him present a noble example to the sailor and the soldier, and prove that the profession of war can promote the cause of peace, as well by the methods of the civilian as by those of the combatant, and need not be adverse to, but, on the contrary, aid in the advancing of knowledge. Men are not the less brave for being the more cultivated; and the sailor or soldier who is at the same time a scholar and a man of science, is more likely to prosecute his professional duties with success, even during battle, than the thoughtless and ignorant though brave officer, who aspires in days of peace to no higher reputation than that of a fop.

Of all the seas of the world the Mediterranean is the most famous. Dr. Johnson was not far from wrong, when he said that the grand object of travelling was to behold its shores—those shores upon which the greatest events of antiquity came to pass, and from whence “all our religion, almost all our arts, almost all that sets us above savages,” have been derived. Who that has ever visited the borders of this classic sea has not felt at the first sight of its waters a glow of reverent rapture, akin to devotion, and an instinctive sensation of thanksgiving at being permitted to stand before those hallowed waves? All that concerns the Mediterranean is of the deepest interest to civilized man, for the history of its progress is the history of the

development of the world:—the memory of the great men who have lived and died around its banks; the recollection of the undying works that have come thence to delight us for ever; the story of patient research and brilliant discoveries connected with every physical phenomenon presented by its waves and currents, and with every order of creatures dwelling in and around its waters. The science of the Mediterranean is the epitome of the science of the world. The very name of that inland sea is the text from which the sermon on all other seas must be preached.

If one man more than another could sum up, from long study and sure knowledge, the physical history of the Mediterranean, that one is Admiral Smyth. We owe a great part of our acquaintance with its phenomena of every kind, and not a little of the elucidation of the antiquities and history of many portions of its coast, to this distinguished officer, who for years was engaged in the survey of it, and whose charts are models of accuracy. The British surveyors of this central sea have fortunately been eminently enlightened men, whose tastes, extending far beyond the mere limits of professional knowledge, have peculiarly adapted them for the classic and critical task in which they were officially engaged. Among the earlier English men of science employed was the famous Halley, who in 1702 was sent by Queen Anne, at the request of the Emperor of Germany, to assist

in the survey of the Adriatic. In order to give the Doctor a definite rank and position whilst engaged in such scientific duties at sea, the Queen had previously conferred on him the brevet rank of captain. It is to be regretted that the manuscripts of Halley, when engaged on this service, have not been examined and reported upon; and the scientific traveller to Vienna would do well to endeavour to look them up, since they probably lie among the stores of the Austrian archives.

In 1811 the celebrated survey of the Karamanian coast by Captain, now Admiral Sir Francis Beaufort, was commenced, but cut short in the following year by a desperate attack of assassins, who severely wounded that eminent commander. During the past week we have seen an announcement to the effect that Sir Francis Beaufort has retired from the office of hydrographer to the Admiralty. We cannot refrain, *en passant*, from bearing testimony to the prominent merits of this truly distinguished and enlightened officer. During the many years that he has filled the responsible post of hydrographer, he has invariably taken the highest and noblest view of the duties of the office, regarding it as a trust for the advancement of science and knowledge of every kind, as well as for the special duties belonging to it. He has on all occasions assisted and encouraged every surveying officer who manifested a taste for study and a zeal for research. His own work on Karamania, a

model for descriptive treatises of a similar kind, will ever remain a standard monument in our libraries of his own ability, taste, and science. Truly and worthily does his brother officer, Admiral Smyth, apply to this book the words—*indocti discant et ament meminisse periti*.

The sending out of our author in 1810, and his official appointment to survey in 1817, were fortunate events for the extension of our knowledge of the Mediterranean Sea. The history of his operations is most interesting, but too long to abridge or cite. It is given in full in the volume before us. A list of 105 charts gives some notion of the extent of his labours, but little of the many directions to which, collaterally, his studies were turned. He founded a school of surveyors, out of which many men of eminence have sprung; and, since several of his pupils afterwards became chiefs of surveys themselves, and, imbued thoroughly with the spirit of their master, sought to transmit it to their own pupils in turn, the gallant Admiral may lay claim to the scientific parentage of a numerous and distinguished family of hydrographers, his philosophically produced children and grandchildren. The list is too long to cite, but we may instance in his eminent successor, Captain Graves,—one of the first generation after the Admiral,—one whose labours have done full justice to the source of his training; and in the present chief of the Mediterranean survey, Captain Spratt, a most

worthy member of the second generation,—a man who has attained distinguished and deserved eminence in several departments of science as well as antiquities.

It is difficult, within our limited space, to give a fair notion of the value of the matter contained in a work treating of so many subjects as this before us does, or to present a consecutive summary of its contents. It is indeed a library-book and a handbook, which no geographer, no scholar, and no philosophic naturalist should be without. We shall however extract, almost at random, some passages of general interest, such as the following, on the colour and luminosity of the Mediterranean :—

“The usual tint of the Mediterranean Sea, when undisturbed by accidental or local causes, is a bright and deep blue; but in the Adriatic a green tinge is prevalent; in the Levant Basin, it borders on purple; while the Euxine often has the dark aspect from which it derives its modern appellation. The clear ultramarine tint is the most general, and has been immemorially noticed; although the diaphanous translucence of the water almost justifies those who assert that it has no colour at all. But notwithstanding the fluid, when undefiled by impurities, seems in small quantities to be perfectly colourless, yet in large masses it assuredly exhibits tints of different intensities. That the sea has actually a fine blue colour at a distance from the land cannot well be contradicted; nor can such colour—however influential the sky is known to be in shifting tints—be considered as wholly due to reflection from the heavens, since it is often of a deeper hue than that of the sky, both from the interception of solar light by the clouds, and

the hues which they themselves take. This is difficult to account for satisfactorily, as no analysis has yet detected a sufficient quantity of colouring matter to tinge so immense a body of water; wherefore Sir Humphry Davy's supposition of an admixture of iodine cannot be admitted, for its presence is barely traceable under the most careful analysis. Those who contend for there being no colour at all, may remind us that the blue rays are the most refrangible; and that being reflected in greatest quantity by the fluid (which, because of its density and depth, causes them to undergo a strong refraction), they cause a tint which is only apparent. Be that as it may, seamen admit of one conclusion—namely, that a green hue is a general indication of soundings, and indigo-blue of profound depth.

“The peculiar occasional luminosity of this sea was particularly noticed by Pliny and many elders, and, in common with that of other waters, it has long been a subject of scientific inquiry, rational conjecture, and ignorant wonderment; and it is really as difficult of a full solution as it is superbly beautiful in effect. Every assignable cause has been advanced; putrescent fish, electricity, atomic friction, cosmical vortices, absorption and emission of solar beams, and what not, have all and severally been brought forward, and after various tilts of discussion, laid aside again. But most naturalists now impute this phosphorescent appearance partly to the decomposition of animal substances, and partly to the countless myriads of mollusca, crustacea, infusoria, and other animalcules which can voluntarily emit a luminous brilliance, the chemical nature of which is still unknown.”

This luminosity is indeed a singularly striking phenomenon, and one especially remarkable in the Mediterranean. In our own seas it is often very brilliant, and with us is chiefly due to myriads of minute jelly-fishes; but in the south it gains in

vividness through the assistance of more luminous and larger medusæ, and of molluscs of the *Salpa* genus, which, adhering together so as form long and tortuous chains, shine beneath the waves like fiery serpents.

The apparent absence of tides in the Mediterranean invariably attracts the attention of the traveller. There is much popular misconception on this subject, which a perusal of Admiral Smyth's chapter on the Mediterranean tides will set right:—

“The Mediterranean, though poetically termed a ‘tideless sea,’ is far from being so in reality; for accurate observation detects a sensible elevation and depression of its waters—independent of currents, surface drift, or wind-raised swells. This, if not wholly, is partly ascribable to the lunar sympathy, as manifested by the alternate changing of the stream, and a periodical rise and fall, somewhat coincident with the oscillations of the Torricellian tube; the lowest surface accompanying a high barometer, and *vice versâ*. But as yet these are hardly admissible terms, for though there are places—as Venice and Jerbah—where the fact of a tide is shown in the amount and periodicity of its recurrence, and others where it is obvious from not immediately mingling with water differing in temperature, set, and velocity, still the tides over most part of this sea are so feeble and irregular as to be difficult to ascertain. Hence it has been asked, If these motions are attributable solely to the attraction of heavenly bodies and centrifugal force, how is it that the moon, which is acknowledged to have an attractive power sufficient to move such vast bodies of water as the Atlantic and Pacific oceans, should exert its influence so slightly over the inner sea, that many will hardly believe there are any tides in it? To this the Newtonian answers, The strait by which it communicates with

the ocean is so narrow, that it cannot in so limited a time receive or discharge sufficient water to alter the elevation of the whole surface sensibly : and he moreover insists, that instead of the faintness of the Mediterranean tides being an objection to the theory of planetary attractions, it is a fair proof in its favour. For herein, the moon acting at the same moment in all parts, diminishes the gravity of the mass ; while the difference of atmospheric pressure upon such a sea, may tend to obliterate any slight appearance of tide that would occur if the pressure were uniform over the whole surface. Over a large space the air is increased in bulk, and consequently diminished in weight, by an almost tropical heat, thereby occasioning mobility and alternation. Yet there being little or no neighbouring water to move forward and increase the liquid elevation,—which is produced in other cases less by a vertical rise of the waters attracted than by a lateral flowing of adjacent waters by virtue of their greater density,—there consequently can be but weak tides in small seas, especially when the entrances are comparatively narrow and shallow, and face the west, a direction opposite to the general movement of the great mundane tidal wave.

“ Still, although the Mediterranean tides are irregular, in many parts scarcely perceptible, and mostly so inconsiderable in a nautical point of view, that with a few exceptions they are scarcely worth appreciating, they are unquestionably interesting when physically considered, as exponents of a general cause ; nor will it be forgotten that the theory of tides was first studied on those very shores, even from the time of Pytheas. Posidonius, who measured an arc of the meridian, explained the ebbing and flowing of the sea from the motion of the moon ; and he seems to have been the earliest who declared the law of these phenomena, although Cæsar nearly at the same time (*De Bello Gallico*, lib. iv.) alluded to the nature of spring tides, as being connected with the moon’s age. But assuredly Pliny advanced on this subject almost all that was

possible for human sagacity, before Sir Isaac Newton unveiled the great law of the universe, and demonstrated that the same force which guides the planets in their courses causes the waters to rise and fall. Now Pliny had formally said, that the cause of the phenomena is in the sun and moon—*verum causa in sole lunâque*—adding the remarkable assertion, that the moon exerts her power as well under the earth as when she is seen aloft.”

Blunders in charts, as well of omission as of commission, are serious enemies to the navigator. The loss of many a good ship may be laid to the charge of the carelessness of some engraver’s apprentice and the culpable negligence of his master. As in book-making, so in map-making, the compiler is too apt to copy his work from the last copy, and to take no heed of the original authority. Admiral Smyth gives a long list of the misfortunes that have sprung from this inexcusable source, and his concluding remarks on this matter are most deserving of official consideration at a time like the present :—

“ Although in this enumeration I have merely alluded to the early portolani, without forestalling my text I may here mention that the more recent plans and drawings preserved in the British Museum also reveal the awful neglect of our modern chartwrights, and it was high time that Government should take so important an affair out of irresponsible hands. Among many other matters, the examiner will find on charts drawn more than a century ago, with bearings and leading-marks, many of the rocks supposed to be recent discoveries. The noted shoal off Al Bekur, on which the ‘Culloden’ struck,—an accident which might have occasioned the loss of the battle of the Nile,—

was tolerably well drawn on the homely plans of Lorenzo Mesfud and Antonio Borg; and it was even published in Bellin's 'Mediterranean Atlas' so far back as 1771. The shoals near the Egyptian coast also, on which, in 1800 and afterwards, so many of our vessels struck, besides our actually losing the 'Cormorant' of 24 guns, the 'Fulminante' 10, and the 'Parthian' sloop-of-war on them, were well known long before. The Lefkimo shoal, Corfu, on which several of our ships have struck, is well placed on the older surveys; and so is the Gomenizze shoal, in the channel of that island, whereon the 'Bacchante' frigate lay many hours, and was obliged to throw her guns overboard to lighten her, on which Borg marks one *brazzo*. The bank which tails off Augusta, in Sicily,—where we lost the 'Electra,' of 18 guns, in March, 1808—is well drawn by the pilots of the Maltese galleys; and the channels of Trapani, on the west side of the island, appear to have been very fairly examined by them, although they remained nearly unknown to our cruisers. At the close of October, 1803, the fleet under Nelson anchored at the Maddalena islands, which had recently been examined by Captain Ryves. When they had watered, placing the fullest reliance on the chart furnished by that officer, the ships beat out without any accident. In the following year however, a line-of-battle ship, the 'Excellent,' struck on a rock just outside the very centre of the channel; and two other dangers were found in the vicinity of the spot where our fleet had been beating. Admiral Sir R. G. Keats told me that he congratulated Nelson on having escaped so well, adding, 'It is evident, my Lord, that Providence protects you.' These rocks were known to the Maltese pilots, yet might have occasioned a ruinous loss at the opening of an eventful war. Again, the extensive reef off Marsa Scirocco, in Malta, on which the 'Alexander,' 74, was greatly damaged in 1799, is shown on those old plans; as is also the shoal in Carbonara Bay, Sardinia, on which the French lost two valuable store-ships, in their ill-fated expedition of 1793.

“Among a few documents of the kind, which I presented to the British Museum in 1848, is a plan of the north-east part of Elba, surveyed on the 4th of June, 1772, by Lorenzo Mesfud—‘Primo piloto sulla capitana Galera della Sacra Religione Gerusolimitana di Malta:’ though rudely drawn, its soundings are correct, and the marks for a dangerous shoal—since omitted—in the inner channel are admirably given; namely, the inner side of Topi islet in one with Point Pera, and Cape Vita on with Torre di Giove. Again, respecting the rock off Cape Mafafuz, forming the east point of the Bay of Algiers: on my visit to this part in 1816, in passing Mafafuz at rather more than a mile distant, I perceived a breaking sea in the offing; yet, the wind being fresh, could take no particular notice of it at the time. But some time afterwards, on looking over some nautical plans by the pains-taking Mesfud, I found one with a shoal marked near the spot on which we observed breakers. I therefore gave directions to Lieutenant Slater, who commanded my tender, the ‘Nimble,’ to examine it in 1826; he soon found the rock, and sounded the whole vicinity. He could not however discover less water than four and a half fathoms; and this was precisely in the position from the extreme point of Mafafuz that Mesfud had placed it nearly sixty years before.”

The last extract we shall make is one that may serve as a reminder of many facts, peculiarly interesting at this moment—viz. a memorandum on the geographical features of the Black Sea.

“The Black Sea (*Pontus Euxinus*) is an inland basin with a margin of coast generally elevated and rocky, having a transverse diameter of about 650 miles from west to east, a conjugate one of more than 300, and an area of 172,000 square miles. Its modern name is supposed to originate from the dense fogs which occasionally cover it, or the danger of its navigation arising from these fogs:

at all events, it was much dreaded by the ancients, who placed their Cimmerian land of utter darkness on its northern shores. Besides the fresh water from Asia Minor, it receives some of the largest rivers in Europe, including the Danube (*Ister*), Dnieper (*Borysthenes*), and Dniester (*Tyras*), the Don (*Tanais*), and the Kouban; its waters are in consequence only brackish; and it is singular that, with such a large and constant accession of fresh streams continually pouring into it, any saltness should be retained. Its depth in general is great, no bottom being struck with 150 fathoms of line; but off the mouth of the Danube the water deepens very gradually, and nearly as much so from Serpent's Isle by Odessa to the Crimea. The streams of the great rivers produce strong currents, particularly in the beginning of summer, when they are increased by the melting of the snows; and when strong winds act against these flowings, a chopping sea is produced, which, in foggy weather, is dangerous to small craft. Independently however of such chances, the Black Sea is free from any dangers, having, with a trivial exception or two, neither islands, rocks, nor reefs in the general track of navigation; and almost everywhere there are excellent anchorages, affording good riding for the largest ships. Its trade consists of grain, wine, timber, charcoal, pitch, potash, fish, caviar, isinglass, shagreen, salted provisions, cheese, poultry, butter, wool, hides, hemp, tallow, honey, tobacco, salt, iron, copper, and saltpetre, but especially corn.

“The large body of water on the north-east of the Euxine, called the Sea of Azof (*Palus Mæotis*), the Azák-deniz-i of the Turks, has a surface of rather more than 13,000 square miles; and, from the action of its rivers, its waters are rather brackish than salt. The navigation of this subdivision of the Black Sea is impeded by the freshets of the Don, its general shallowness, numerous shoals, and occasional ice; nor can it be entered by shipping otherwise than by the narrow strait of Tamen or Yenikaleh (*New*

Castle), the ancient Cimmerian Bosphorus. But notwithstanding these physical impediments, such are the advantages of moral exertions, that Taganrog, its chief port, is a place of considerable and increasing consequence, the value of its import trade in 1850 being upwards of 380,000*l.*, and its exports about half a million.

“It seems agreed among cosmogonists, that the Black Sea, at a remote period, extended much further to the east and north than it now does, occupying the whole of the vast plains and steppes that surround the Caspian and the Sea of Aral, neither of which had then a separate existence,—the difference of their levels having arisen at later periods. Their depth must probably alter materially, since the beds of the rivers above-mentioned are charged with an extraordinary quantity of sand and *slime*, which, from the rapidity of their course, they hold in suspension till they approach the sea; where, spreading over a wider area, and flowing in a more gentle current, they deposit the substances brought down, so gradually that the elevation of their bed is almost imperceptible. Polybius, who states this as a cause for predicting the filling up of the Euxine in process of time, describes a shoal one thousand stadia in length before the mouth of the Ister, at one day’s sail from the land; this having long since disappeared, has no doubt become a part of the delta of the Danube. The Sea of Azof has manifestly contracted its boundaries.”

Admiral Smyth’s memoir comes out at a time when it is especially required. This accident is fortunate. The work is really the summary of the labour of years, and a more valuable volume has seldom proceeded from the British press

IV.

THE BLUNDERS OF PSEUDO-PHILOSOPHERS.

WE have read this book with mingled pain and indignation,—pain at the spectacle of a once-powerful intellect becoming helpless and weak through wading beyond her depth ; indignation at the display of shallowness and self-conceit, received by a mesmerized woman of genius as so much profound philosophy.* We are not of those who object to the institution, by earnest and capable men, of a rigid and logical inquiry into the reasons for the faith that is in us. We can sympathize with the throes of a wounded spirit tortured by unbelief, and with the doubts that thorn-like tear the mind, harassed by perplexities about the faith of its childhood. Though led by our own convictions to a creed as opposite as the poles from that of Francis Newman, we can patiently examine his arguments, and fearlessly analyse his conclusions, knowing

* *Letters on the Laws of Man's Nature and Development.*
By Henry George Atkinson, F.G.S., and Harriet Martineau.
John Chapman.

them to be the results of earnest thought, and the man to be among our brightest, yet humblest intellects. But with flippant impiety we can hold no terms; with the inflated arrogance that would bring God and his prophets, the faith of Bacon, and Milton, and Newton, the earnest and well-weighed convictions of many of the brightest geniuses, whose advent has been to the world as blessed sunshine, to the bar of condemnation, like so many suspected impostors and detected impositions summoned before a self-sufficient city magistrate, we can have no expression save contempt.

“An ill book well written” (we quote old Jeremy Collier) “is like poisoning a fountain that runs for ever; a man may do mischief this way, it may be, as long as the world lasts. He is a nuisance to future ages, and lays a snare for those who are yet unborn.” This is not a place for the discussion of articles of faith or principles of religion, however virulent be the assault upon them; but this *is* the place wherein to show how a mischievous book is unworthy of trust on account of the incapacity of its authors. It may seem strange and presumptuous in us to connect the word “incapacity” with the name of Harriet Martineau. When admiration is warranted, she has no more sincere admirers than ourselves. We have delighted in her historical researches, in her acute analyses of human character and action, in her heartfelt endeavours for the physical good of man-

kind, and her never-failing sympathy with the cause of the poor and oppressed; but we have marked—without wonder, for the case is not an uncommon one—her inability to deal with scientific evidence, her bigoted credulity, and unbounded trust in the infallibility of her own judgment, and her ignorance of the methods of accurate scientific observation, research, and experiment. Her ‘Letters on Mesmerism’ afforded to all rigidly-reasoning men of science manifold proofs of the effeminate overcoming the masculine element of her mind. Few, very few women have ever shown the capacity to deal with physical and physiological science; and Harriet Martineau is not one the few.

The history of these letters is this:—Miss Martineau, anxious to know, “with great particularity,” how to set about the study of the powers of Man, “in order to understand his nature, place, business, and pleasure in the universe,” wrote last year to her friend, Mr. Henry George Atkinson, for the required information. A correspondence ensued, which, apparently to the lady’s satisfaction, settled man and his faculties, his nature and development, theology and science, matter and causation, Christianity and miracles, dreams and ghosts, light and the laws of nature, the belief in a future state, and the existence of a God! And all in two dozen letters! The inquiries are made in familiar—strangely familiar, considering the

subject—forms of speech; the responses are more dignified and oracular. The oracle speaks first, pronouncing “all the systems of the world are wrong.” The questioner is “not a whit alarmed” thereat, but concludes that the oracle must “have gone a step farther than other people,” and that he is “more modest than everybody.” “Now, then—what is the brain?” asks Miss Martineau [we quote the question as given in the book]. Phrenology and Mesmerism furnish a satisfactory reply, eliciting however a supplementary question from the lady, who anxiously asks, “Why a liver disorder (in the mesmeree) causes pain in the shoulder (in the mesmerizer)?” When Mr. Atkinson has done with the brain in general, his delighted pupil, after asking for the loan of a skull, exclaims, “Now for the cerebrum!” The oracle then pronounces his dicta upon the cerebrum, prophesying that when we shall have the brain mapped out “after the manner of a physical atlas, then we shall have a true chart of the philosophy of the mind.” The senses and the nervous system next pass under a judgment, wherein the oracle mystifies us in many ways by a physiology of his own, and, among other strangenesses, tattles of the “absorption of pain,” and the absorption of sulphur, as similar processes. Miss Martineau inquires further, and is told some strong “facts about the senses,” chiefly derived from mesmerized patients; these facts seem to us to cut every way. The senses disposed

of, the inquirer submits a string of very serious questions :—

“ Pray tell me too, whether, in this last letter, you do not, in speaking of God, use merely another name for law? We know nothing beyond law, do we? And when you speak of God as the origin of all things, what is it that you mean? Do we know anything of origin?—that it is possible? Is it conceivable to you that there was ever Nothing?—and that Something came of it? I know how we get out of our depth in speaking of these things; but I should like to be aware *where, exactly, you think our knowledge stops.*”

The oracle replies as well as his “ poor thoughts will aid ” him, assuring his disciple that “ all theologies will be found to be the offspring principally of abnormal conditions of disease ”—that “ philosophy finds no God in nature, and sees no want of a Creator ”—that “ prophecy, clairvoyance, healing by touch, visions, dreams, revelations, and the delusion of believing themselves divinely inspired, are now known to be simple matters in nature, which may be induced at will, and experimented upon at our firesides, here in London,—climate and other circumstances permitting,—as well as in the Holy Land ”—that (strangely misunderstanding the natural history of the matter) Mr. Crosse’s acari are the fruit “ of the noblest experiments of the age ”—that “ the desire of a future existence is merely a pampered habit of mind, founded upon the instinct of preservation.” The wondrous flippancy and folly of this portion of the book, to say

nothing of the impiety of these "poor thoughts" of Mr. Atkinson, astounded us. With Miss Martineau the impression produced was different. "I am glad," she replies, "I asked you in what sense you used the words 'God,' 'Origin,' etc., for your reply comes to me like a piece of refreshing sympathy—as rare as it is refreshing." The oracle speaks again, and pronounces against Christianity. "Strange as it may appear," says Mr. Atkinson, "and impossible as it may seem to so many, the Christian religion is, in fact, and will soon be generally recognized as no better than an old wife's fable!" Shortly after, a gleam of truth breaks out; the oracle (not Miss Martineau) exclaims, "I am running on like an old gossip." The lady puts fresh questions—about the connection of light and sight, etc.; and "also about how you conceive we may set to work to imagine the manner of the fact that we know to be fact,—that dying people impress others at a distance with a knowledge, by sensation, that the process of death is taking place?" The oracle wishes he could give a satisfactory reply to her questions respecting the nature of light, expresses sorrow that Reichenbach has not appreciated the facts of phrenology, declares that "clairvoyance or prophecy is no greater step from our ordinary condition than seeing would be to a blind person," and replies to the inquiry relating to dying persons; of which reply the following fragment may serve as a specimen:—

“To estimate properly the effect of persons dying, we require more correct data as to time and circumstance ; and it is difficult to attain this. But of the existence of the fact, I have evidence in the form of many good instances ; and so have you : and most persons have some case of the kind to relate. When the dying person appears to another in a form, such as of a black cat, or a shadow, or as a person, it is merely an induced condition, or subjective embodiment of an impression made. How any one can conclude otherwise seems marvellous. When a man is dead, he is dead—as a magnet is dead when the magnetic force is removed ; a diamond is dead when it becomes charcoal. A certain constrained force, so to speak, is released, and this it is which influences. In every change force is released, and a disturbance caused.”

Miss Martineau then winds up with renewed expressions of delight and wonder, and thanks Mr. Atkinson for the indications he has given “of the immediate nature and immeasurable extent of our ignorance.” The oracle has the last word, congratulating himself indirectly upon being foremost among truth-seekers, and expressing his kindly pity for the errors of good and respectable people. And for such babbling as this, Miss Martineau gives up all faith in Christianity and a future state, and abandons herself to a belief in the unbelief of Mr. Henry George Atkinson !

It is curious to find the name of Bacon taken in vain throughout these Letters, in which his method is entirely lost sight of. What would the great advocate of inductive reasoning say to the following extract from one of Miss Martineau's Letters?—

“It is really vexatious that I cannot convey to you, or any one, what I think I have reason to rely on about this ; —the existence of some faculty or faculties by which things can be known or conceived of apart from all aid whatever of the senses which usually co-operate in the presentment of ideas. You know that I preserve some distinct recollections, on awaking from the mesmeric trance, of the ideas presented in that state. Well: twice at least I have perceived matters so abstract as to owe no elements whatever (as far as I could discover) to the ordinary senses. For instance—I believe there are no persons (not blind) who have any ideas whatever with which visual impressions are not more or less implicated. I have asked everybody, for many years,—everybody whom I thought capable of the requisite consciousness and analysis ; and they all tell me that there is nothing so abstract but that they entertain some image inseparably connected with the thought. The days of the week,—the virtues and vices,—numbers,—geometrical truths,—even God,—all these have some visual appearance, under which they present themselves,—be it only their printed names. I have not had the opportunity of questioning the blind (from birth) about this ; but I am assured by some who have, that they have the same experience derived from the other senses than that in which they are deficient. Now, in certain depths of the mesmeric state, I have received knowledge or formed conceptions, devoid of all perceptible intermixture with sensible impressions. Of course, I cannot explain what they were, because they could be communicated only to a person in a similar state, and not by ordinary language at all. They have since (during five years) been gathering to themselves more and more visual elements ; so that the experience remains only an affair of memory. But it is one which assuredly I can never forget. There is no pleasure that I would not forego to experience it again and often;—the conscious exercise of a new faculty. I wonder whether you saw (as I did) lately, in a newspa-

per, an account of Wordsworth's rapture in once being able to smell a flower ;—the only time in his life that the sense ever acted. I know what that is, for almost the same thing once happened to me : but it is nothing to the other experience I spoke of. The one occasions extreme and tumultuous amazement—(the first experience of a new sensation) ;—a sort of passionate delight, a conviction on the spot that we are only groping in a universe where we think everything ours, till a new primitive sensation comes to show us how far we are from comprehending* nature ; and then presently we have had enough of it."

Whilst condemning the vague and crude speculations and sham reasonings of this book, professed to be based on mesmerism and phrenology, let it not be supposed that we are denouncing either of these pseudo-sciences. The great physiological and psychological importance of the facts—and they are many—of mesmerism, we fully appreciate, and earnestly desire for them investigation. We see no absurdity in the proposition that segments of the brain are organs of our mental and moral faculties. This confession of faith should exonerate us from the accusation of bigotry in pronouncing judgment. But the investigation of the phenomena upon which mesmerism and phrenology are based, requires the sternest and strictest methods, such as have certainly not been applied to them by the greater number of men

* "For Man's sense is falsely asserted to be the standard of things. On the contrary, all the perceptions, both of the sense and of the mind, bear reference to Man, and not to the universe."
—*Bacon, Nov. Org. Aph.* 41.

who have undertaken the task, and most of whom, to use a phrenological phrase, have 'wonder' developed so as to overpower their reasoning faculties, even though some of them are men of genius, and all—at least all we have ever known, and we are happy to say it—men of unimpeachable integrity and earnestness. This wondering condition of mind incapacitates a man for correct observation of biological, physical, or psychological phenomena. An eminent German geologist, who visited England a few years ago, said he came over to meet and scan the persons of the British authors on his favourite subject, in order to judge whose works were worth reading and whose not, and on whom he could depend. How would our professed mesmerists and phrenologists stand this test?

After all, we doubt whether the fallacies and sophisms of these Letters are likely to deceive many. They are served up so repulsively, that none but weak and wandering minds are likely to suffer from their perusal. Their authors are grievously mistaken in their estimate of human nature. The belief in a God of love, the hope of a future life, of a purer and happier state, are elements of the human mind, inseparable from its healthy constitution. For our own part, we think with the illustrious Henry More, that "the generations of men shall as soon become utterly irrational as plainly irreligious."

At one of the earlier meetings of the British Association an album was prepared for the signatures of members; the majority who signed in it entered not only their names, but also the designation of the scientific battalion under which they had enlisted. The mass of men 'unknown to fame' enrolled themselves as 'geologists!' Whilst no science can boast of a stronger array of regular troops and good soldiers, it is the misfortune of geology to be embarrassed by a heterogeneous assemblage of disorderly irregulars, who claim to serve under her banners, but do discredit to the cause. Among these Captain Hutton may hold a command, and Mr. Ritchie a chaplaincy.*

It has rarely been our fate, during a long and patient inspection of various samples of pseudo-scientific absurdities, to meet with more outrageous specimens of pretentious rubbish than the volumes under notice. The writers can surely have no friends, otherwise they had never been suffered to publish them. Under such circumstances our remarks would have been very brief, and written 'more in sorrow than in anger,' were it not for the boastful spirit with which these books are pervaded, and the mischievous prejudices they are calculated to foster. Neither of them are professed

* *The Dynamical Theory of the Formation of the Earth.* By Archibald Tucker Ritchie. 2 vols. 8vo. Longman and Co.

The Chronology of Creation; or, Geology and Scripture Reconciled. By Thomas Hutton, F.G.S., Captain, Bengal Army. Calcutta: Thacker.

to be sent forth in opposition to geological science—quite the contrary : both authors make a display of their respect for, and acquaintance with, geology and the writings of geologists, among whom each would claim to take his station. The unscientific readers into whose hands their works may fall—and, unfortunately, authors of bad and spurious books have a mania for circulating their productions among persons not likely to be critical,—will rise from their perusal bewildered by the abundant citation of scientific authorities, and awed (if unable to detect their inconsecutive absurdities) by the *ex cathedrâ* tone maintained by these would-be *savans*. The show, not substance, of theological research, ostentatiously displayed by these amateur divines, may take effect among the amiable and partially educated ignorant ; especially that class, by no means small, impressed with a vague sense of the truth that lies in science, and an undefined fear of a fancied antagonism between science and religion. To such persons, who would willingly learn the truth did they know how and where to find it, we would earnestly recommend the excellent discourses ‘On the Relations between the Holy Scriptures and some parts of Geological Science,’ by one who has just departed from among us, the lamented Dr. J. Pye Smith, a clergyman whose learning and scientific acquirements were equal to his piety.

The two stately octavos ushered into the world

by Mr. Archibald Tucker Ritchie are not likely to undergo much voluntary perusal. More awful prosing we have never endured—nor more unmitigated nonsense. Witness in proof, once for all, the following summary of the whole work, as extracted from amid the flourish of inharmonious trumpets with which our philosopher prefaces his lengthy chapters :—

“It is no easy task to persuade mankind that the sparkling briny seas, which are now so easily excited and lashed into foam by the ambient atmosphere, were once a dark, unruffled, and atmosphereless mass of turgid waters, charged to repletion with the mineral elements of those stony concretions which now engirdle the terraqueous globe, and which have been thrown up as barriers to restrain the very waters from whence they themselves were deposited.

“Nor is it a less arduous undertaking to convince those who delight in the invigorating influences of the health-giving atmosphere, that, for ages, this sphere existed without so indispensable a means of sustaining voluntary motion, and that myriads of apulmonic creatures, ‘more numerous than the sands on the sea-shore for multitudes,’ were all the while employed as the humble and submissive agents of the Creator, in producing one of its component elements ; in elaborating *that*, without which no being endowed with the faculty of locomotion could either have breathed, moved, or lived.

“All these, nevertheless, are truths—truths of the utmost importance. Of this, the perusal of the following treatise can hardly fail to convince every unbiassed mind, even although our relative position towards the world’s inhabitants involves the alternative, either that we are in a trance,—have been for so many years enjoying the most soul-satisfying dream, whereby the records of revelation

have appeared to be at one with the discoveries of science, and to have kept pace with these wherever they have been made ; where every closed lock seems to undo, and every barred door to fly open at our approach, and on the announcement, *that there once was a period when the earth had no rotation*,—or mankind, on the contrary, have been in a profound slumber, as regards this important fact, for nearly six thousand years ! This is our true relation to each other at the present moment. But it is full time that the spell should be broken, and the rightful position of each be justly determined.

“ With this intention, responsible as it is to stand against the arrayed opinions of a whole world, we have resolved to be the first to break this long-continued silence, and endeavour to convince all mankind that we have all the while been entertaining no day-dream ; but that what we assert is a reality, and stands upon the authority of the immutable word of God, from which, assisted by the discoveries of science, we can derive the necessary data to prove, that during the period called in Scripture ‘the beginning,’ THE EARTH HAD, IN REALITY, NO ROTATION AROUND ITS AXIS.”

The manner in which Mr. Ritchie carries out his system is not by the evidence of observation—to personal research he candidly puts forth not the slightest claim—but by extracting whatever passages suit his purpose from all manner of published authorities, whether original authors or obscure compilers ; selected, as might be expected, without judgment, and with the strangest misconceptions of the sense of the passages. The hotch-potch so concocted is presented as a ‘Dynamical Theory of the Earth.’

Captain Hutton has a similar happy self-confi-

dence with that which inspires Mr. Ritchie. "Horace," writes the Captain, "recommends that an author should take nine years to weigh and reconsider the subject-matter of his work; and no doubt, in general, the advice would be sound, if a man could only make sure of living so long. We have even gone beyond the time assigned, and yet are modest enough to believe that a longer time would have added materially to the value of our labours." Some, perhaps, may even deem it matter of regret that the work was not postponed *sine die*; but from them we beg leave to differ—no man, however dim and imperfect it may be, having a right to hide his light under a bushel. Accordingly, he lights his farthing candle forthwith, and for what purpose?—to illuminate the Royal Society! "Bearing in mind," he writes, "that the council of the Royal Society had invited 'contributions towards a system of geological chronology, founded on the examination of fossil remains and their attendant phenomena,' the author commenced the task, which he has here brought to a close." Such was the origin of his Un-philosophical Transactions.

Like Mr. Ritchie, Captain Hutton has hunted up geological authorities in all directions, accepting their facts and rejecting their conclusions. Alas for both our friends!—

"The more inform'd, the less they understood,
And deeper sank by floundering in the mud."

They are equally learned in theology, and each has

his own private interpretation of the Mosaic account of the Creation. Unfortunately, the two theologians, civil and military, differ *toto cælo* in their respective readings. The civilian gets over his pre-adamite difficulties by depriving the inhabitants of the primeval ocean of their respiratory organs, and by keeping them for indefinite ages, "during which the earth did not rotate on its axis," in warm fresh water. The soldier will not endure such slow work. He makes his animals and plants as fast as he can; creates them full grown in myriads, and kills them ten minutes after; originates saurians and coprolites at the same critical moment; piles stratum upon stratum by what he calls "speedy accumulations," after which "fresh creations are necessary;" deposits the Purbeck and Wealden beds, in consequence of the effects of the forty days' rain, at the time of the Deluge (in favour of which catastrophe he *naïvely* cites Sir T. Dick Lauder's "Account of the Moray Floods, *passim*," and—what will Dr. Mantell say?—the "Geology of the S.E. of England"); and winds up by a post-diluvian creation (known only to himself) of the Tertiary Fauna and Flora! The heading of a single chapter will show that we are not caricaturing:—

"Chapter XXV. Effects of the forty days of rain; deposition of the Purbeck and Wealden beds; effects of the breaking-up of the fountains of the great deep; volcanic action; subsidence of land; chalk of volcanic origin; rise

and fall of the Deluge progressive ; tranquillity of its occurrence refuted ; subsidence of the waters and re-appearance of dry land."

Captain Hutton even ventures to determine, on geological data, the exact age of the world from its beginning to the date of the composition of his memorable volume : here is the calculation :—

"Geological Chronology.

	Yrs.	Ms.	Ds.
From the first day to the commencement of the Tertiary or post-diluvian era . . .	2210	5	3
From the Deluge to the termination of the Tertiary period	194	0	12
From the Tertiary period to the birth of Christ	3021	11	18
From the birth of Christ to the current year	1849	0	0
	<hr/>		
	7275	5	3"

Among the many geological speculations contained in his treatise, few exceed in originality that which concerns the origin of erratic blocks. On the third day of creation (if we rightly gather the author's sense—not always very clear), the volcanic matter from the centre in a state of fusion bursts through the adjoining unfossiliferous strata, turns them partly into granite, contracts, splinters, and splits, in contact with the cool waters of the surrounding sea ; and shivers into fragments, which, having their angles rounded as they fall through the waters, become the erratic blocks, and consequently rest on the surface of strata, which, according to the Captain's own showing, were formed some

couple of thousand years afterwards. Surely "the force of nonsense can no further go."

The author of these surprising speculations is a Fellow of the Geological Society, and professes to be an authority on scientific matters in India. What Mr. Ritchie's calling may be we do not know; but assuredly it is not scientific. If these gentlemen persist in their endeavours to astonish Geology, they could not do better than join the Dean of York, a philosopher of similar opinions and attainments; and by putting all three of their heads together, they need not despair of forming a conglomerate, such as will be unequalled by any pudding-stone in the long catalogue of known strata.

Some time ago a letter appeared in the pages of a facetious contemporary, professing to give a full and particular account of the gold-diggings on Salisbury Plain. The document must have been a pilot-balloon to the volume before us, for its author, Mr. Calvert, professes to have found the true El Dorado at home!* He has been in Australia, picking up nuggets by the dozen; travelling over "twenty-one thousand miles of its soil," not to speak of smaller excursions; turning up endless "auriferous sands, earths, veins," etc., and satisfying himself of the existence of no less than "four

* *The Gold Rocks of Great Britain and Ireland.* By John Calvert. Chapman and Hall.

hundred and thirty-four thousand, one hundred and ninety tons, two cwt., seventy-six pounds" of gold, "which, at 3*l.* 19*s.* per ounce, will be about 46,100,571,660*l.*!" Mr. Calvert, when in Australia, had the good luck to find, "with very few exceptions," two hundred and thirty-eight gold quartz veins himself. One of them he traced "for nearly forty miles across the country," and calculated, if properly treated, to be capable of yielding "some millions sterling." He christened it "the Macquarie Vein." There is a story of a spiteful entomologist who, finding everything in Australia called after Governor Macquarie, except an undescribed bug, named his *Cimex C. Macquariei*. We trust, for Mr. Calvert's sake, that the new offering to the tutelary deity of antipodean mountains, rivers, streams, birds, beasts, and fishes, may not prove a bugbear. The contemplation of such prodigious riches appears to have awakened the true feelings of a Briton in our mineral surveyor; and, instead of tempting him to remain in the land of gold, induced him to return to his native land, and to bring the diggings home with him. He has now planted them in Britain.

"In these pages," writes Mr. Calvert, "I have at any rate proved, beyond reasonable doubt, the existence of profitable gold-workings in these islands, over a wide area, but I cannot yet answer for the total extent of the deposits." It is wonderful how many people knew about British gold

when their attention was called to the fact of its abundance. "Many noblemen and gentlemen came to show me," says Mr. Calvert, "specimens of gold from their estates and mines; and some came up from very distant parts of the country to see and ask me to visit their property." The members of the Stock Exchange were equally obliging, and gave our author every information about "the nature of their workings,"—a true and certain knowledge of which, at the right moment, would, we are quite sure, enable much less intelligent persons than Mr. Calvert to get hold of considerable quantities of gold. "Many members of the press also took an interest in the subject"—a fact of which we entertain not the slightest doubt; we question, however, whether the gold mines in the possession of our brethren of the pen are particularly worthy of Mr. Calvert's attention, although his own peculiar method of exploring British gold mines and finding native nuggets has, in the majority of instances, been effected by paste, scissors, and goose-quill. It is indeed astonishing, as the greater portion of his book will show, how large a quantity of British gold he has excavated from the pages of Petters, Plowden, Watson, Abbot, and various county histories. Mr. Hyde Clarke seems to have been the operative miner in this proceeding, and deserves high praise for the numerous and interesting odds and ends of auriferous intelligence that he has compiled, after diligent literary research in

the British Museum. It is but fair to say that Mr. Calvert has made many journeys of inquiry in various parts of Britain, with the view of satisfying himself about the presence and abundance of gold. It does not appear that he has personally found the precious metal in very profitable quantities; although, by a peculiar process of reasoning, a logic of his own, he makes quite sure of its existence. Because there are a dozen British gold mining companies at this time, and because gold undoubtedly exists here and there in British rocks, he maintains that the home Government should at once commence the proper development of our auriferous resources; appoint salaried commissioners, selected, he "respectfully suggests," from those who "are at any rate desirous to find" gold—returned diggers, in other words; organize a department of commissioners for the issue of licences; abolish Crown monopolies; adjust the claims of the Crown, the landowners, and the public; issue licences to "thousands," and wash the sea-sands, a process which even our sanguine mineral surveyor admits to be "very questionable." We are sceptical enough, even after reading Mr. Calvert's book through, to say to ourselves, "first catch your hare," and to doubt whether we can afford to spend a sovereign in the extracting of seventeen shillings' worth of gold from British ores. We are foolish enough to put more trust in profitable returns than in picked specimens.

With his astonishing expertness in the discovery of gold, Mr. Calvert ought by this time to be as rich as Cræsus. A man who sallies out in the morning, carries off seventy-six pounds' weight of pure gold, value 3700 pounds sterling (it swells to seventy-eight pounds in the middle of his book), and considers the proceeding nothing very alarming, ought to grow into a millionaire in less than no time. The project for making the fortunes of the British public, revealed in this treatise on 'The Gold Rocks of Great Britain and Ireland,' is not the less generously offered, because Mr. Calvert might carry off all the spoil himself if he chose.

We wish our mineral surveyor would leave the word "geology" out of his writings. His scientific notions are, to say the least, exceedingly confused and obscure. He has got hold of the word, but has yet to learn its meaning, and the alphabet of the science. Like most "mineral surveyors" in a similar condition, he writes very confidently and absurdly about geological matters. Whatever geology his brain contains at present, must be, to use one of his favourite terms, in *cryptothesis*,—concealed or impalpably disseminated. Putting the sham science out of the question, his book is worth looking into, and cleverly written. It is exactly such a volume as will suit the table-turning intellect of the present age, and we should not be at all surprised if Mr. Calvert were to take as distinguished a position in his way as Mrs. Haydon

did in hers. Seek where he will—hey ! presto ! there's the gold !

Oh that Dr. Knox would read his own book ! If he did, he would rise from the perusal of it with feelings of considerable disappointment.* He would say something very bitter about the author, inquire very maliciously whether he were not a Celt, and conclude by praising the occasional vigour of the style, and deprecating the abuse of everybody and everything jumbled together without fixity of purpose. We are afraid that the Doctor is too hardened a scribe ever to change the manner and matter of his discourses, or to sit down seriously and earnestly to the working out of even a fragment of philosophical criticism, such as it is evident by the title-page his book was intended to be. Where could he have found nobler subjects than those whom he has selected ? Cuvier, Geoffroy, Leonardo, Angelo, Raphael—wonderful frames all ; the names of men who have been beacons to the world. They seem to be oddly consorted, yet the linking of them together, through a fanciful or fancied analogy between the work they did and the intellectual conditions of the world with which they had to deal, is a good idea, and one that might well have been the theme of a noble

* *Great Artists and Great Anatomists.* By Robert Knox, M.D. Van Voorst.

discourse. But Dr. Knox, whilst he may claim the great merit of understanding the missions of these mighty spirits, uses their effigies most ignominiously, making them so many shields or masks, from behind which, while professing to sing their praises, he is viciously aiming arrows of withering scorn or savage ridicule at men of renown, and scientific associations who have unwittingly given him cause of offence.

In the contrast and comparison drawn between Cuvier and Geoffroy, it is difficult to make out clearly whether there is or is not an intention to disparage Cuvier. To our notions of that great man, the estimate here presented of him is decidedly under what it ought to be. Dr. Knox professes to be, and we believe truly is, an earnest admirer of, and believer in, his genius; and yet much here written about him would almost lead to the impression, that he holds Cuvier unentitled to the rank of genius. The surest way to do honour to Cuvier is to walk in his footsteps, and do good work for the world as he did. The world will honour you for doing so, but not for neglecting it to abuse your fellows. If the winner of the Derby had stopped to kick, he would not have been the winner of the Derby. If Dr. Knox had given his own genius fair play, powers such as he is endowed with would have placed him in a foremost position among the honoured of the world of science. Good men, but not better men than

he is, have passed him in the race because he stopped to kick.

When commenting upon the ‘great artists,’ Dr. Knox writes more pleasantly, because he has no personal antipathies to cherish. Not being an artist himself, although a sincere admirer and appreciator of art, he cannot well be jealous of painters and sculptors. There is much interesting criticism, well worthy of the attention of students of art, in this part of his book. His opinions on the value and true use of anatomical knowledge in art are especially deserving of attention, the more so since, himself an eminent anatomist, he is not inclined to lay an overstress on anatomical display. We quote the following remarks and advice with much pleasure, believing them to be sound and true :—

“There is but one school of Art—Nature. But to read her volume profitably, artists must study profoundly the antique Greek and ancient Italian school, formed by the era of Leonardo, Angelo, and Raphael.

“It may precede or follow, or coincide with the study of the living figure; still these immortal works must be your guide. For whether it be composition, or colouring, or design, you are likely to find that these masters read Nature more clearly than you ever can. But do not copy or imitate them further than as objects of study.

“Learn anatomy by all means, but do not forget its object. When you draw a dissected limb be sure to sketch the living one beside it, that you may at once contrast them and note the differences. In drawing from the nude figure, contrast your sketch with the antique; you will find in it many defects. Never forget that perfection, the

result of a high specialization of Nature's law of individuality, is rare; the opposite, that is, imperfection, the result of a tendency to unity of organization, is by far the more common. You will be chiefly called on to draw the draped figure: see that you place your drapery not on a machine, but on a person of *fine feeling*. Fashion in dress is the trick of society, to substitute a conventionalism for beauty and fine forms; never sacrifice art at its shrine, but paint the person in what *becomes* him or her, regardless of the existing mode.

"The relation Anatomy holds to Art is to explain, first, how far the shapes and figures of the inward structures modify the external forms of man and woman; second, it informs the artist of the meaning of such forms; third, it explains to him the laws of deformation, that is, of variety in external forms, the causes of these varieties, and the tendency to which they lead. As an artist, he must represent them, no doubt; but, in doing so, let him wisely follow Nature rather in her intentions than her forthcomings, and return to the perfect, or to its approximation, whenever time and circumstances permit him to do so."

If Dr. Knox intends to write any more books, let him write them in the spirit of this passage, and he will be read with pleasure, and meet with that general approbation which can never be obtained by unreasonable sneers, however pithily worded.

V.

WHALEMEN AND THE WHALE.

OUR literature is rich in vivid descriptions of the adventures and perils encountered by whale-fishers. The admirable and standard work on the Northern Fisheries by Scoresby, the graphic accounts of sperm-whaling by Beale and Bennett, and the spirited narrative of an Arctic whaling voyage by Robert Goodsir,—a delightful memorial of brotherly affection, by one who is now in the Polar Seas seeking for the lost Franklin and his companions,—are instances of the charm with which men who have themselves joined in the chase of Leviathan can tell what they have seen with all the zest of terrestrial sportsmen—albeit their game is more dangerous to follow. The volume before us is a worthy companion to its predecessors.* The substance of the book consists of information collected and observations made by an American clergyman,

* *The Whaleman's Adventures in the Southern Ocean, as gathered by the Rev. Henry T. Cheever, on the Homeward Cruise of the Commodore Preble.* Edited by the Rev. W. Scoresby, D.D., F.R.S. Low.

an invalid, who adopted the novel fashion of seeking for health by embarking in a whaling voyage to the South Seas and Pacific Ocean. These have been revised and annotated by the man of all others most competent for the task, the Rev. Dr. Scoresby, an old whale-fisher himself, and the soundest of authorities on the subject of whaling. The result of this union of equally able author and editor, is the production of a charming volume, presenting the rarely combined features of being a book adapted alike to delight boys and men,—one which the naturalist will peruse for fresh information on the habits of *Cetacea*, and the clergyman recommend on account of the spirit of cheerful piety and truthfulness that pervades the narrative.

Great Britain has had a main share in originating as well as following out this branch of marine enterprise. Two centuries have rolled away since our sailors commenced to brave the dangers of the Arctic Seas, in pursuit of the mightiest monsters of the deep. A hundred and fifty years ago, our American colonies launched their ships to chase the sperm-whale in the mid-Atlantic, and exactly a hundred and thirty-two years have passed since the great sperm-whale fishery of the Pacific was first opened through the energy of a London merchant, Mr. Enderby, whose namesake, and we believe descendant, the adventurous and respected governor of the Auckland Islands, has within the last year opened a new field in the same depart-

ment of British industry. In 1821 the British whale-fishery employed 159 ships, but the decline of the northern fisheries has reduced their number to one-half. We are compensated for this, however, in the energy and success with which our Australian colonies are joining in the business; and the rich source of blubbery wealth which the north once was, the south now promises to be. At present we are beaten in whaling by our American cousins; but the great advantages presented by the proximity of Australia and the Auckland Isles to the southern whaling grounds are giving us a fresh start, of which we will not be slow to avail ourselves. In 1844 the American whaling fleet numbered no fewer than 650 vessels, tonnage 200,000 tons, and manned by 17,500 men. In 1848 the number was slightly under this estimate, though including nearly one-tenth of the entire shipping of the United States. The social importance of this fishery will be appreciated when it is stated, that nineteen years ago it was estimated that as many as 70,000 persons in the United States derived their chief employment and subsistence in one way or another from the whale-fisheries: the number so deeply interested in them must be even greater at present. Other countries, besides Britain and America, have but a small share of these profits; some sixty or seventy vessels from French, German, and Danish ports make up the number of whalers. It must not be forgotten, however, that

the indefatigable Hollanders had at one time a lion's share of the whale-fishery to themselves,—as long ago as 1680 there were fully 260 ships, and 14,000 Dutchmen employed in the trade,—nor that the first professional whalemens and original harpooners were Biscayans.

Alas ! our goose with the golden eggs is not to live for ever. The days of the mighty Greenland whale are numbered, and the sperm seems doomed ere long to be swept from the seas. There is no hope for either. Strange as it may seem, the perseverance and cupidity of man are unquestionably destined to extinguish the existence of the mightiest denizens of the deep. Neither trouble, nor agility, nor strength can save them. They are as surely to be exterminated as the Red Indians are, or any other unfortunates who have the ill-luck to stand in the way of the Anglo-Saxon race. We must have oil for our lamps and wheels, and spermaceti for our candles and ointments ; our wives and daughters must have whalebone for their stays, and our umbrellas must have spokes. Consequently the whale must die : not merely individual whales, but whole species of the tribe must be extinguished. A hundred years hence the *Mysticetus* will take its place with the dodo, and go to that bourne (the British Museum) from whence no extinct animal returns. It will be a little better known than the bird, because more of its remains shall have been preserved. To perish during an

epoch of naturalists was not the fate of the dodo ; the whale will fare better. In the meantime, let our museums be on the alert, and ponder well on the consideration that *Mysticeti* and *Macrocephali* are fast approaching the condition of *Ichthyosauri* and *Plesiosauri*, and that their shadows are growing fewer every day. When Scoresby wrote his 'History of the Arctic Regions,' some thirty years ago, the Greenland whale abounded in the Spitzbergen seas ; it had once, there is reason to believe, extended its range to Nova Zembla. For a century and a half the chief scene of the "right-whale" fishery had lain between Spitzbergen and Greenland ; but the patience of leviathan could endure annoyance no longer. Continual persecution and incessant thinning of his ranks cleared that sea within the lifetime of whalers still living, to whom it had once seemed inexhaustible. The fishery is no longer followed there. Davis' Straits has in its turn become unproductive. We are seeking for our gigantic prey among the ice-bound recesses of the Polar Ocean ; before long the last *Balæna mysticetus* will probably make a final stand and hold us at bay at the North Pole.

In the work before us the probable duration of the north-west whaling, at present the most prolific ground, including even the fresh field of the Polar Ocean in the calculation, is reckoned to continue good at least twenty or twenty-five years from its recent commencement. But no hope is held out

for the poor whale: "chased from sea to sea, and from haunt to haunt, he is doomed to utter extermination, or so near it that too few will remain to tempt the cupidity of man." Nor for the sperm-whale either: "the history of the sperm-whale fishery from the first, when only five or six months were necessary to complete a cargo upon the Brazil ground and fifteen upon that of Chili, to its present almost entire abandonment as a separate business, confirms this calculation. Before the end of the present century therefore, judging from the past, is it not likely that the hunting of whales on the sea will be any more prosecuted as a commercial business than the hunting of deer on land? In one part of the world they have been driven to the deepest recesses of Baffin's Bay, and in another to the very confines of the Pacific and off to the icebergs of the antarctic zone." Not content even with this comparatively natural course of destruction, we must make short work still shorter. Lieut. Maury, of the United States Observatory, is engaged in calculating, on sound data, the exact places where whales may expect to find their food in the Pacific at certain seasons of the year; not however for the benefit of the whales, who would doubtless, if they had their option, request Lieut. Maury to save himself the trouble. That gentleman expects to be able "to fix the localities of the whale's resorts," with a view to make the results of the voyages of the whale-ships more sure and

speedy. This is indeed getting leviathan into a fix—one from which there is no chance of a safe exit.

The good clergyman who here records his experience of whaling has come from the chase a sympathizer with the victim, and not with the destroyer. It is too late now to become the friend of the whale; his life-lamp is nearly burnt out, the oil is feeding the last flicker, the doom is pronounced, and leviathan must perish. Yet Mr. Cheever's sentiments are worthy of note, as well as those of the old whaler by whose opinion he backs his own; though we question whether a pang of compassion ever unnerved the arm of that ancient mariner when he plunged the merciless harpoon into the vitals of his ponderous victim:—

“Between all his natural foes and its predacious human enemy, the great mammoth of the ocean seems doomed to extinction. But I have no scruple at confessing that, since I have become closely acquainted with the habits of the great right whale,—how quietly it grazes through the great pasture ground which God has ordained for it, and fitted so well to be its home; and since I have observed the hazards that have to be encountered, and the perils to be surmounted, in its capture by men; and have coupled with this, consideration of the various sources from which the human family can now be supplied with oil, whether for burning or the arts,—I begin to be somewhat doubtful about the lawfulness and expediency of the whale fishery. As an old whaler once said in his own way, ‘Whales has feelings as well as anybody. They don’t like to be stuck in the gizzards, and hauled alongside, and cut in, and fried in them ’ere boilers, no more than I do.’”

As long as the sperm-whale and the right-whale are extant, the mighty finners (*Balænoptera*), whose prodigious fleetness makes them too dangerous to encounter, will escape the fate of their less fortunate and slower brethren. But it is probable that sooner or later steam, or some force more powerful, will give speed and deadliness of aim to new-fangled weapons, under which even they must succumb.

The habits of the “right whales” of the North Pacific would seem to render them formidable enemies, and to indicate considerable differences between them and the gentle and unwieldy Greenland whale. In the sea between the coast of America and Kamtchatka they are now most abundant; and there, from May to October, the American whalers reap a rich harvest—one, too, likely to last a little longer than elsewhere, since the Russians providently prohibit bay-whaling, a practice destructive to the “cow” whales about the time of calving.

“Those huge north-west whales are more vicious, and less easily approached after they are struck, than the whales of other latitudes. It is considered no disgrace to be run away with by one of those jet-black fellows, found in forty-five or fifty degrees north; and many an old whaler, who had made his boast that never yet did a whale run off with him, has been compelled to give in as beaten when fast to one of these ‘North-west Tartars.’

“One captain says he has seen instances of the most wonderful strength and activity in these whales, greater than he ever saw before in either right or sperm. He

was once fast to a large cow whale, which was in company with a small one, a full-grown calf. They kept together, and after a time the captain hauled his boat up between them. When they were both within reach, he shoved his lance 'into the life' of the cow, at which she threw her flukes and the small part of her body completely over the head of the boat without touching it (although they were half-drowned with the water she scooped up), and the full weight of the blow, intended for the boat, fell upon the back of the other whale. It sunk immediately, going down bent nearly double, and, the captain thinks, must have been killed by the blow. The same person has seen a stout hickory pole, three inches in diameter, and six feet long, broken into four pieces by a blow from a whale's tail, and the pieces sent flying twenty feet into the air, and that too when no other resistance was offered than that of the water upon which it floated.

"The first whale this man struck in that fishing region turned him over in two different boats, and afterward 'knocked them into kindling wood,' while spouting blood in thick clots; and yet this whale, with singular tenacity of life, lived four hours afterward. He came up alongside the boat, and turned it over with his nose, and then, with his flukes, deliberately broke it up. Of course the crew had to take to Nature's oars, and they all marvelously escaped unhurt, although one of them was carried, sitting upon the whale's flukes, several rods, till he slid off unharmed from his strange sea-chariot. This man could say, in one of the sailors' rude rhymes whom we have already quoted,

'Although he furiously doth us assail,
Thou dost preserve us from all danger free;
He cuts our boat in pieces with his tail,
And spills us all at once into the sea.'"

Mr. Cheever gives a good account, too long to quote, of the capture and cutting up of a noble

sperm-whale, witnessed by himself when on the Brazil banks in the Atlantic. He describes the aspect of the monster's enormous head as "square, the end of it something like the largest timber log I have seen, sawed off straight." With this gigantic frontispiece, measuring nearly one-third of the animal's entire length—the individual taken was sixty feet long—the creature sometimes runs full butt against the sides of a ship, and instances are narrated of fearfully destructive consequences resulting from its anger. The New Englanders are great destroyers of sperm-whales, and makers of spermaceti candles. They may be truly said *to make light* of their formidable prey. They have a standing toast and sentiment—"New England enterprise: it grapples with the monsters of the Pacific to illuminate our dwellings, and with the problems of science to enlighten our minds."

Not a few most interesting sailors' yarns are collected by the author, illustrative of the dangers of whale-fishing; indeed it becomes very evident, that were the sperm-whales to put their heads together and make a determined set against their persecutors, neither ships nor whalemén could survive the collision. What they can do is shown in the following fearful tale:—

"But the most dreadful display of the whale's strength and prowess yet authentically recorded, was that made upon the American whale-ship 'Essex,' Captain Pollard, which sailed from Nantucket for the Pacific Ocean, in August,

1819. Late in the fall of the same year, when in latitude 40° of the South Pacific, a school of sperm whales were discovered, and three boats were manned and sent in pursuit. The mate's boat was struck by one of them, and he was obliged to return to the ship in order to repair the damage.

"While he was engaged in that work, a sperm whale, judged to be eighty-five feet long, broke water about twenty rods from the ship, on her weather bow. He was going at the rate of about three knots an hour, and the ship at nearly the same rate, when he struck the bows of the vessel just forward of her chains.

"At the shock produced by the collision of two such mighty masses of matter in motion, the ship shook like a leaf. The seemingly malicious whale dived and passed under the ship, grazing her keel, and then appeared at about the distance of a ship's length, lashing the sea with fins and tail, as if suffering the most horrible agony. He was evidently hurt by the collision, and blindly frantic with instinctive rage.

"In a few minutes he seemed to recover himself, and started with great speed directly across the vessel's course to windward. Meantime the hands on board discovered the ship to be gradually settling down at the bows, and the pumps were ordered to be rigged. While working at them, one of the men cried out, 'God have mercy! he comes again!' The whale had turned at about one hundred rods from the ship, and was making for her with double his former speed; his pathway white with foam. Rushing head on, he struck her again at the bow, and the tremendous blow stove her in. The whale dived under again and disappeared, and the ship filled and fell over on her broadside, in ten minutes from the first collision.

"After incredible hardships and sufferings in their open boats, on the 20th December the survivors of this catastrophe reached the low island called Ducies, in latitude $24^{\circ} 40'$ south, longitude $124^{\circ} 40'$ west. It was a mere

sand-bank, nearly barren, which supplied them only with water and, very scantily, sea-fowl. On this uninhabited island, dreary as it was, three of the men chose to remain, rather than again commit themselves to the uncertainties of the sea. They have never since been heard from, the island being seldom visited.

“On the 27th of December the three boats, with the remainder of the men, put away together for the island of Juan Fernandez, at a distance of two thousand miles. The mate’s boat was taken up by the ‘Indian,’ of London, on the 19th of February, ninety-three days from the time of the catastrophe, with only three survivors.

“The captain’s boat was fallen in with by the ‘Dauphin,’ of Nantucket, on the 23rd of the same month, having only two men living, whose lives had been eked out only through that last resort of hunger in the wretched, which words shudder to relate! Out of a crew of twenty, five only survived to make the ear of the world tingle at their strange eventful story.”

Throughout the volume the “right whales” of the Pacific and South Seas are referred to as the *Balæna mysticetus*, though, from the context, it is evident both author and editor regard them as specifically distinct from the Greenland whale. In any future edition of ‘The Whaleman’s Adventures,’ it would be well to add a note on the technical names and distinctions assigned by zoologists to the several members of the whale tribe, whose habits are so cleverly described in these interesting chapters. The book is adorned with wood-engravings of some perilous adventures in whale-capture.

Thrice unlucky Herman Melville ! Three goodly volumes has he written, with the main purpose of honouring the Cachalot, and disparaging the *Mysticete* ; and his publisher has sent them into the world in brilliant covers of blue and white, with three Greenland whales stamped in gold on their binding. How they spout ! Three unmistakeable *Mysticeti*, sloping heads, and jaws fringed with long combs of baleen. Shade of extinguished spermaceti, how thy light has been put out by the bookbinders !*

This is an odd book, professing to be a novel ; wantonly eccentric ; outrageously bombastic ; in places charmingly and vividly descriptive. The author has read up laboriously to make a show of cetological learning. He has turned over the articles Whale, Porpoise, Cachalot, Spermaceti, Baleen, and their relatives, in every Encyclopædia within his reach. Thence he has resorted to the original authorities—a difficult and tedious task, as every one who has sought out the sources of statements set forth without reference in Cyclopædias knows too well. For our own part, we believe that there must have been some old original Cyclopædia, long since lost or destroyed, out of which all the others have been compiled. For when one is compared with another, it becomes too plain that one or other is a barefaced pillage and extract from a secondhand source. Herman Melville is wise in

* *The Whale*. By Herman Melville. 3 vols. Bentley.

this sort of wisdom. He uses it as stuffing to fill out his skeleton of a story. Bad stuffing it makes, serving only to try the patience of his readers, and to tempt them to wish both him and his whales at the bottom of an unfathomable sea. If a man will light his lamp with whale oil, when gas and camphine are at hand, he must be content with a dull illumination.

The story of this novel scarcely deserves the name. The supposed author, a young sailor, resolves to join the whalers. He falls in with a strange bedfellow at starting, a picturesque savage, one Queequeg, a New Zealand prince, who has abdicated his dignities in order to see the world, and who moves through nautical society with a harpoon in his hand and a wooden god in his pocket. Mr. Melville cannot do without savages, so he makes half his *dramatis personæ* wild Indians, Malays, and other untamed humanities. Queequeg and the writer become sworn friends. They join a whale-ship, commanded by a strange old one-legged Captain Ahab, who cherishes a mysterious purpose—no less than the intention of pursuing to death a ferocious white spermaceti whale, who has knocked no end of ships to pieces, and chewed off any number of legs, arms, and heads of whale-fishers. Ahab peregrinates the ocean in search of his enemy, for it was Moby Dick—that is the name of the whale—who abbreviated the Captain's lower extremities. What the author's original intention

in spinning his preposterous yarn was, it is impossible to guess; evidently, when we compare the first and third volumes, it was never carried out. He seems to have despaired of exciting interest about a leviathan hero and a crazy whale-skipper; and when he found his manuscript sufficient for the filling up of three octavos, resolved to put a stop to whale, captain, crew, and savages by a *coup de main*. Accordingly, he sends them down to the depths of ocean all in a heap, using his milk-white spermaceti as the instrument of ruthless destruction. How the imaginary writer, who appears to have been drowned with the rest, communicated his notes for publication to Mr. Bentley is not explained. The whole affair would make an admirable subject for an Easter entertainment at Astley's.

Having said so much that may be interpreted as censure, it is right that we should add a word of praise where deserved. There are sketches of scenes at sea, of whaling adventures, storms, and ship-life, equal to any we have ever met with. A single extract will serve as an illustration. It is a description of an attack upon a whale during a squall, and the fearful consequences of the rash exploit:—

“Our sail was now set, and, with the still rising wind, we rushed along, the boat going with such madness through the water, that the lee oars could scarcely be worked rapidly enough to escape being torn from the rowlocks.

“Soon we were running through a suffusing wide veil of mist; neither ship nor boat to be seen.

“‘Give way, men,’ whispered Starbuck, drawing still farther aft the sheet of his sail; ‘there is time to kill a fish yet before the squall comes. There’s white water again:—close to, Spring!’

“Soon after, two cries in quick succession on each side of us denoted that the other boats had got fast; but hardly were they overheard, when, with a lightning-like hurtling whisper, Starbuck said, ‘Stand up!’ and Queequeg, harpoon in hand, sprang to his feet.

“Though not one of the oarsmen was then facing the life-and-death peril so close to them ahead, yet, with their eyes on the intense countenance of the mate in the stern of the boat, they knew that the imminent instant had come; they heard too an enormous wallowing sound, as of fifty elephants stirring in their litter. Meanwhile the boat was still booming through the mist, the waves curling and hissing around us like the erected crests of enraged serpents.

“‘That’s his hump. *There, there*, give it to him!’ whispered Starbuck.

“A short rushing sound leaped out of the boat,—it was the darted iron of Queequeg. Then all in one welded commotion came an invisible push from astern,—while, forward, the boat seemed striking on a ledge: the sail collapsed and exploded; a gush of scalding vapour shot up near by; something rolled and tumbled like an earthquake beneath us. The whole crew were half-suffocated as they were tossed helter-skelter into the white curdling cream of the squall. Squall, whale, and harpoon had all blended together; and the whale, merely grazed by the iron, escaped.

“Though completely swamped, the boat was nearly unharmed. Swimming round it we picked up the floating oars, and lashing them across the gunwale, tumbled back to our places. There we sat up to our knees in the sea,

the water covering every rib and plank, so that to our downward-gazing eyes the suspended craft seemed a coral boat grown up to us from the bottom of the ocean.

"The wind increased to a howl; the waves dashed their bucklers together; the whole squall roared, forked, and crackled around us like a white fire upon the prairie, in which, unconsumed, we were burning,—immortal in these jaws of death! In vain we hailed the other boats; as well roar to the live coals down the chimney of a flaming furnace, as hail those boats in that storm. Meanwhile the driving scud, rack, and mist grew darker with the shadows of night: no sign of the ship could be seen. The rising sea forbade all attempts to bale out the boat. The oars were useless as propellers, performing now the office of life-preservers. So, cutting the lashing of the waterproof match keg, after many failures Starbuck contrived to ignite the lamp in the lantern; then stretching it on a waif-pole, handed it to Queequeg as the standard-bearer of this forlorn hope. There then he sat, holding up that imbecile candle in the heart of that almighty forlornness;—there then he sat, the sign and symbol of a man without faith, hopelessly holding up hope in the midst of despair.

"Wet, drenched through, and shivering cold, despairing of ship or boat, we lifted up our eyes as the dawn came on. The mist still spread over the sea, the empty lantern lay crushed in the bottom of the boat. Suddenly Queequeg started to his feet, hollowing, his hand to his ear. We all heard a faint creaking, as of ropes and yards hitherto muffled by the storm. The sound came nearer and nearer; the thick mists were dimly parted by a huge, vague form. Affrighted, we all sprang into the sea as the ship at last loomed into view, bearing right down upon us within a distance of not much more than its length.

"Floating on the waves we saw the abandoned boat, as for one instant it tossed and gaped beneath the ship's bows like a chip at the base of a cataract; and then the

vast hull rolled over it, and it was seen no more till it came up weltering astern. Again we swam for it, were dashed against it by the sea, and were at last taken up and safely landed on board. Ere the squall came close to, the other boats had cut loose from their fish, and returned to the ship in good time. The ship had given us up, but was still cruising, if haply it might light upon some token of our perishing—an oar or a lance pole.”

Mr. Herman Melville has earned a deservedly high reputation for his performances in descriptive fiction. He has gathered his own materials, and travelled along fresh and untrodden literary paths, exhibiting powers of no common order, and great originality. The more careful, therefore, should he be to maintain the fame he so rapidly acquired, and not waste his strength on such purposeless and unequal doings as these rambling volumes about spermaceti whales.

VI.

THE BRITISH MUSEUM AND ITS WONDERS.

AMONG the many wonders that excited the admiration of the crowds of intelligent foreigners who visited London during the past eventful summer, none—Aladdin's Palace of Glass always excepted—called forth more expressions of heartfelt delight than the British Museum. The long and stately galleries, filled with treasures of art and nature, or laden with the concentrated essences of human learning—the miles of sumptuous cabinets and cases, enshrining here gorgeously-plumed birds or delicately-sculptured shells, there exquisite labourings of human skill, elegantly-shaped and painted vases, or elaborate and minute carvings—here, the jewellery of nature, there of art—might well impress the spectator with astonishment. There are great cabinets, great museums, and great libraries on the Continent, many of them boasting to be superior to ours in some special department; but there is none in which the delights of the intellect are displayed in so magnificent a setting, and treated with such luxurious respect.

Many find fault with the juxtaposition of objects and collections so heterogeneous as those amassed under a single roof in the British Museum. Possibly there is weight in the censure. But for ourselves it must be confessed, that we find a charm in this magnificent collocation of dissimilar things, this pile of glorious works of nature and art, heaped, not without order however, together. A walk through the British Museum is an intellectual feast, of which all the courses have been duly served. We come away with all the cravings of our mental appetite satisfied with digestible and wholesome food; our bibliographical longings in one, our antiquarian in another. The exquisite marbles of Greece leave their delicious taste on our art-palate. The cinerary urns of Etruria gratify that strange and sepulchral relish for decay which the grosser epicure finds in well-kept game. Our truly British admiration of a joint is fulfilled in the mammalian saloons; or if we would pick a bone well worth the picking, then we go among the mammoths, leviathans, and moas in the fossil galleries, and take the small gems and lustrous crystals to serve as condiment to our Titanic drum-stick. The botanical rooms are our vegetable garden, whence we get preserved fruits and spinach *en papillote*. And if, after so ample a feast, we feel inclined for a lighter repast, are there not oysters and scallops, crabs, lobsters, and sea-eggs, all of the prime quality?

The Gallery of Organic Remains in the British Museum consists of a suite of six rooms, a length of nearly 400 feet. The splendid mineralogical collection is arranged in the same apartments with the fossils. Few persons who have considered the subject will doubt that these collections should be kept distinct, and placed under an entirely independent charge. In the present condition of science, minerals, considered as such and not as geological materials, fall rather within the province of the chemist and crystallographer than of the naturalist. The national collection of minerals is one of the finest in existence, and of far too great value and consequence to be made secondary or subsidiary to a totally distinct department. At the same time there could be no greater mistake than the making the charge of the palæontological collections a mere appendage to the curatorship of the minerals. The two offices can very rarely, if ever, be effectively combined in one individual.

The organic remains in the Museum are arranged in zoological and botanical order—in order of their natural affinity, and not in geological sequence. We believe this to be the true plan for a general collection, and can conceive nothing more unwise than any attempt to break up such an arrangement, and throw the specimens into geological sequence; that is to say, in chronological order of their occurrence in strata. Within the compass of the minor groups this may be at-

tempted, and has been in some of the cases. But, well as it has been done, we should prefer to see the attempt confined within the limits of genera, and not extended to order and class. In a general collection, a great part of which must necessarily be composed of specimens whose exact geological habitat cannot be precisely ascertained, or must be guessed at from the statements of incompetent persons, or, it may be, the misstatements of dealers, a pretence of arrangement in precise sequence of epochs is more calculated to deceive than to instruct. But the spectacle of all the various forms of extinct creatures ranged in order of their natural affinities, organism placed beside organism in accordance with the relationship of anatomical structure and external characters, is sure to prove of the highest interest, especially when they are collected together in immediate proximity, not mingled, with the finest series of preserved specimens of existing animals that has ever been brought together in any museum since the world began. There should however be a concordance in the arrangements of the recent and fossil collections. To make them thoroughly useful, the same system should be adopted in each, and a similar scheme of nomenclature. In public museums, the labelling of specimens should rather follow published systems than profess to be in advance of them. We object strongly to the bewildering of unfortunate students by the exhibition

of specimens of known things under new and unknown names. A new name for an old species or genus may be adopted in a museum when the reason *why* has been published, but not till then. In the labelling of species really new, some such word as 'unpublished,' or mark 'MSS.' should always be attached to the ticket; and if a new generic name be assigned to the new species, then some memorandum of a proximate recognized genus should be added as an explanation. Fossil specimens should either be arranged along with recent and as part of a combined collection, or kept entirely apart, classed as a corresponding series. We make these remarks, because in the present arrangements of the British Museum there is manifested a want of some definite and acknowledged plan, and an evident absence of co-operation between the recent and palæontological departments. With officers so able and active as the establishment can boast of, this should not be. As to a series of fossils arranged in geological sequence, for the reasons we have already stated, we do not think this could be made out with benefit. It is now being effectively done in the Museum of Practical Geology, where, through the peculiar facilities afforded by the geological survey, there are all the means and materials for carrying such a system out. What with the stratigraphical collections in that Institution, and the systematic ones in the British Museum, there are now in London

facilities freely afforded to the public at large for the study of organic remains, both in their natural history and geological bearings, such as were never offered before.

To make museums useful, manuals and guides, drawn up by qualified persons, are required. The qualifications necessary are so considerable for any one section, that popular guides to public collections are seldom of more value than the explanations of the fogleman of a raree-show. But when taken in hand by men able for the task, and of high authority, there are no greater boons to intelligent visitors and students. It is a satisfactory indication of progress in a right direction to see guide-books and catalogues of various departments of the British Museum drawn up either by officers of the institution, or by competent authorities who take an interest in it. Such a work as that lately sent forth by Mr. Vaux upon the antiquities there might form a good model. Some of the catalogues issued by the Zoological department are admirable examples of well-directed and learned labour. The volume before us is a valuable addition to the increasing literature explanatory of the Museum. The scheme of it is excellent.* No better notion could have been hit upon than that

* *Petrifactions and their Teachings; or, a Handbook to the Gallery of Organic Remains of the British Museum.* By Gideon Algernon Mantell, Esq., LL.D., F.R.S. Henry G. Bohn.

of giving woodcut plans of the several rooms and their contained cases, and then describing the remarkable objects in each, according to their position. To give still greater interest to his task, Dr. Mantell has commented at length, and with delightful vivacity and eloquence of style, on the most important or curious particulars connected with the history of the several specimens, and a vast amount of geological and natural history information is superadded, so as to render the volume excellent and instructive reading. In many respects it is a personal narrative of his own researches, and those of his worthy sons,—a very natural proceeding, when we consider how the present gigantic growth of this magnificent assemblage of organic remains has in a great measure sprung out of the nucleus formed by the Mantellian collection. The name of Mantell will be for ever associated with the history of the British Museum.

It is difficult to select from a work of this descriptive nature passages such as can give a fair example of the manner in which the author has effected his task. We feel bound however to take a brick or two out of the building, in order to show in how interesting and instructive a style the principal objects noticed are described. Indeed, the learned Doctor seems to have discovered an art similar to that which has gained so much applause for Mr. Minton at the Great Exhibition,

for all his bricks have enamelled surfaces, and when put together exhibit symmetrical and highly ornamental designs.

Here is his notice of the famous fossil salamander of *Æningen* :—

“Among the tertiary lacustrine deposits of the Continent, that of *Æningen*, near Constance, has long been celebrated for the perfection and variety of its organic remains, and particularly for batrachian reptiles. A short but graphic memoir, by our distinguished countryman, Sir Roderick Murchison, presents, in a few lines, the history of these ancient lacustrine deposits.

“The Rhine, in its course from Constance to Schaffhausen, cuts through the tertiary marine formation, called the *molasse*, which rises into hills from 700 to 800 feet high, on each side of the river. On the right bank, a little above the town of Stein, is the village of *Æningen*, near which, in a basin, or depression of the *molasse*, there is a series of deposits, composed of laminated marls, and cream-coloured fetid limestone, amounting in thickness to between thirty and forty feet.

“In these marls are imbedded the foliage and stems of various kinds of dicotyledonous trees, shells, remains of insects, crustaceans, fishes, turtles, and of large batrachians. These fresh-water beds have manifestly been accumulated in a lake at some very remote period, for their deposition must have long preceded the present condition of the country, as by far the greater number of the animals and plants are either extinct forms, or belong to species not known as indigenous in Europe: and the Rhine has worn a channel through the entire series and the *molasse* on which they are superposed, to the depth of several hundred feet.

“In the early part of the eighteenth century, the fossil batrachians of *Æningen*, deeply interesting as they are to

the palæontologist, acquired far greater notoriety than they would ever have obtained as objects of scientific research, in consequence of the opinion which then generally prevailed, that all petrifications had been produced by a universal deluge; and in 1725, the fancied resemblance of a cranium attached to a portion of a skeleton discovered in the quarry at Eningen, to a human skull pressed flat, led M. Scheuchzer, an eminent physician of his day, to declare, that at length the petrified remains of one of the sinful individuals who had perished in that catastrophe were brought to light! Under this delusion he published the well-known treatise entitled, '*Homo diluvii testis et theoscopos.*' This memoir contained an excellent figure of the fossil skeleton, which the author described as 'the remains of one of that accursed race which was overwhelmed by the waters of the Deluge, and whose bones and flesh were incorporated into stone.'

"The rounded form of the head, the size of the orbits, and other batrachian characters of the supposed '*petrified man*,' were however so obvious from Scheuchzer's own figure and descriptions alone, that the true nature of the original was suggested by M. Cuvier before he had seen any of the fossil remains. In 1811, Cuvier visited the Teylerian Museum at Haarlem, in which Scheuchzer's specimen was preserved, and obtained permission to remove such parts of the stone as were likely to conceal any characteristic bones; and, as he had predicted, the anterior part of the skeleton of a large aquatic salamander, with remains of the fore legs, were exposed to view.

"The specimen in the Case before us (of which a reduced figure is given in *Lign.* 41) originally belonged to Dr. Ammann, of Zurich, and was examined by Baron Cuvier when in England. It consists of the cranium, vertebral column, bones of the anterior and posterior extremities, and vestiges of the tail. The skull, which is pressed flat, nearly equals in size that of a man; around the semi-circular jaws there are the remains of a double row of very

fine teeth; the orbits are large; the occipital condyle is double; the remains of the posterior horns of the *os hyoides* are seen on each side of the occiput. There are nineteen or twenty dorsal, and sixteen caudal vertebræ. The ribs are very short, as in all batrachians. The scapula and humerus are exposed on each side the anterior part of the spine; the femora, parts of the tibia, and fragments of the pelvis are also visible. The result of Baron Cuvier's investigations proved that the original of the celebrated Oeningen fossil was an aquatic salamander of a gigantic size in relation to all known existing species of the genus."

Far more terrible than this prince of salamanders was the gigantic lizard discovered by Dr. Mantell himself, and of which so many wonderful relics are preserved in our national collections. Its name and every feature are so linked up with the fame of its discoverer, that just as it is utterly impossible to conceive the idea of St. George without the dragon, so is it beyond the stretch of imagination to separate the illustrious geologist of the Wealden from his attendant iguanodon. There is this important difference however to be noted; St. George's main purpose was to knock the dragon to pieces,—Dr. Mantell's, to put the pieces of his dragon together. How skilfully he recomposed them, the cases of the British Museum and the pages of the volume before us show. After a very full account of the several portions of its skeleton, the author thus concludes:—

"In fine, we have in the iguanodon the type of the terrestrial herbivora, which in that remote epoch of the earth's physical history, termed by geologists '*The Age of Rep-*

tiles, occupied the same relative station in the scale of being, and fulfilled the same general purposes in the economy of Nature, as the mastodons, mammoths, and mylodons of the tertiary periods, and the existing pachyderms.

“With regard to the probable magnitude of the individual to which the largest bones in my collection belonged, a general estimate only can be formed, because the relative proportions of the limbs, head, and body are still unknown: sooner or later an entire, or a considerable portion of the skeleton of a young iguanodon will be brought to light, and yield the information necessary to enable the palæontologist to ascertain the dimensions, and delineate the physiognomy, of the living original.

“The size of the largest iguanodon has been estimated as follows: length of the head, three feet—of the trunk, twelve feet—of the tail, thirteen feet—*total length, twenty-eight feet.*

“This statement will surprise the reader who, from the popular notions of the magnitude of the iguanodon, has entertained the idea that this reptile attained seventy feet in length; but the discrepancy between the above estimate and that first suggested by me, admits of an easy explanation.

“In my earliest notices of the iguanodon, which were published from time to time, as fresh discoveries disclosed new modifications of structure in this prodigious creature, an attempt was made to estimate the probable magnitude of the original, by instituting a comparison between the fossil bones and those of the iguana,—the recent type which the form of the teeth seemed to point out as the one most nearly related to the extinct reptile. It was thus shown that if the proportions were the same in both, the iguanodon must have attained seventy feet or more in length. But this statement was qualified (more than eleven years since) by the remark—‘It is not, of course, pretended that such an estimate can offer more than a *very distant approximation to the truth*;’ yet it may be confi-

dently affirmed, that a reptile which required a thigh-bone larger than that of the elephant to support it, could not be of less colossal dimensions. In truth, I believe that its magnitude is here underrated, for, like Frankenstein, I was struck with astonishment at the monster which my investigations had, as it were, called into existence, and was more anxious to reduce its proportions than to exaggerate them. Should subsequent discoveries prove that the iguanodon more nearly corresponded in the proportions of the tail with the Crocodilian family than with the Lizards, its total length would be much less than is here inferred; and from the shape of some of the metacarpals and phalangeals, it seems highly probable that the original was more bulky in proportion to its length, than the existing Lacertians.

“In subsequent notices this opinion was reiterated, and on the discovery of several perfect anterior caudals, I expressed my conviction that the tail of the iguanodon was shorter than in the iguana, and, instead of being long and round, was compressed laterally, and largely developed in a vertical direction. In my Memoir in the Phil. Trans. 1841 (pp. 137–140), it is stated that ‘from the shortness of the caudal vertebræ, and the length of the spinous processes, indicating a great vertical development of the tail, it is probable that this organ was not long and slender, as in the iguana, but approximated more nearly to the tail of the *Doryphorus*.

“‘The length of the united head and trunk, according to my estimate, is seventeen feet and a half; by Professor Owen’s, it is reduced to fifteen feet: a difference of no importance in such merely approximative calculations, particularly when the form of the cranium is unknown. The great discrepancy is in the estimated length of the tail; if the iguanodon resembled the iguana in its caudal proportions, its total length would be seventy feet; but if the tail was short, the total length of the animal would, of course, be proportionately reduced, and the most gigantic individuals may not have exceeded thirty feet in length.’

“A recent discovery however supports the idea first suggested by the stupendous size of the bones of the extremities. In a block of calciferous grit picked up on the seashore, I have laid bare a chain of eleven caudal vertebræ, belonging to the middle region of the tail; and the bodies of these bones, instead of being abbreviated, as the shortness of the known anterior caudals led us to infer, are elongated as in the corresponding part of the skeleton of the recent iguana. The length of four of these vertebræ is equal to that of five dorsals: and their spinous and transverse processes are so well developed, as to show that the tail must have been greatly prolonged—probably, in the same degree as in the existing lizards. The length of the femur of this individual is equal to six caudal, or eight anterior dorsal vertebræ. It is therefore, according to the present state of our knowledge not at all improbable that the largest iguanodons may have attained a length of from sixty to seventy feet.

“Although some important points in the osteology of the iguanodon are still unknown, we may safely conclude that this stupendous reptile equalled in bulk the large herbivorous mammalia, and was as massive in its proportions; for, living exclusively on vegetables, it must have had the abdominal region greatly developed.

“Its limbs must have been of proportionate size and strength to sustain and move so enormous a carcase; the hinder extremities in all probability resembled the unwieldy contour of those of the hippopotamus or rhinoceros, and were supported by strong, short feet, protected by broad ungual phalanges; the fore feet appear to have been less bulky, and adapted for seizing and pulling down the foliage and branches of trees; the jaws and teeth demonstrate its power of mastication, and the character of its food; while the remains of coniferous trees, arborescent ferns, and cycadaceous plants, which are found imbedded with its remains, attest the nature of the flora adapted for its sustenance.”

There are several consolatory features in the above description, that reconcile us to Dr. Mantell's "Age of Reptiles," an epoch to which, from some strict scientific scruples, we entertain a few objections. These gigantic lizards of the Wealden time were, after all, but amiable vegetable feeders. The huge brutes passed a sort of Arcadian existence, browsing on asphodels and chewing up fir-trees. Undisturbed by either men or tigers, they lived happily and died calmly. Could they have anticipated the future, their constitutional serenity might have been ruffled by dreams of fame and hopes of British Museum immortality. Had they foreseen Dr. Mantell, they would have made a demigod of him. And now, were some convulsion of nature to wake their ponderous frames once more to life, they would step down from their shelves in the Gallery of Organic Remains with no ferocious designs consistent with their awful aspect. They would walk through the Museum saloons without swallowing the obsequious attendants, and into the great library with no more terrific effect than, it may be, frightening Mr. Panizzi into expediting his Catalogue,—for which the public would sincerely thank them.

We like this book too well to permit us to pass over a fault unscolded. We could have wished all controversy, except of the most friendly kind, omitted. It is out of place in a volume intended for general readers, and is only likely to be mis-

understood, and to cause those who do not know philosophers better, to regard them as very quarrelsome people. The battles of geologists have hitherto been renowned for the hearty and friendly good-humour with which they have been conducted. Good hard hits may be given without hard words. Why should those who ought to be friends fall out about a *Streptospondylus*, whether it is to be called *recentior* or *major*; or whether a vertebra belong to that same jaw-breaking animal or to an *Iguanodon*? Surely such questions might be treated in perfect good-humour. What the poet says about wine-glasses—

“Natis in usum lætitiæ scyphis
Pugnare, Thracum est,”

ought to be true about fossils. When ‘Petrifications and their Teachings’ reaches a second edition, as so useful a book is sure to do, we hope to find all irritating expressions expunged, and their places filled up with evidences of friendship renewed.

VII.

SCIENCE AND SPORT IN SCANDINAVIA.

WITH feelings of no slight pleasure we welcome a new work from the pen of the illustrious natural philosopher of Edinburgh.* The beautifully illustrated volume, full of new and interesting matter, now given to the world by Professor James D. Forbes, is, we trust, not only a sign of his continued activity in the pursuit of his favourite studies, but also, as we are warranted to infer from his introductory remarks, of recovery from a long and severe illness, that has caused not a little alarm and sympathy among his scientific brethren. British science could ill afford to part with one of its brightest ornaments ; a philosopher in the highest sense of the word, still in the prime of life, singularly distinguished by the combination of original genius and untiring industry, with those powers of imparting his knowledge eloquently and clearly to disciples that have made the University of the

* *Norway and its Glaciers visited in 1851.* By James D. Forbes, D.C.L., F.R.S., etc. Edinburgh : A. and C. Black.

northern metropolis famous as a school of physical science.

The explorer and describer of the glaciers of the Alps was the fittest person to render an account of the far less known glaciers of Norway—so little known, indeed, that although long ago noticed by Wahlenberg and Leopold von Buch, we have more than once, at scientific meetings, heard surprise expressed at the mention of their existence. Many of our amateur salmon-fishers know them well; but then the members of the gentle craft of angling are too often slow and purblind people, poor observers of finless bodies, or of scenery that is above the waters. We know how savage our modern Izaak Waltons will be at this unnatural abuse of their taste and acuteness; but they must not fancy themselves true appreciators of nature because there often are glorious exceptions—Yarrells, Jardines, and Goulds among them, Tom Stoddarts and James Wilsons. Out of the throng of anglers who yearly penetrate the wildest and most picturesque recesses of Scandinavia, how many are truly able, if willing, to give any comprehensible description of the wonderful scenes they have visited?

The account of 'Norway and its Glaciers' given in the volume before us, although in great part presented in the shape of a journal, interspersed with occasional notices of places and manners, is mainly devoted to the chief object of the author—the description of the grander physical features,

and more especially of those derived from the presence of snow-fields. The most southern glaciers in the country are those that fall from the great snow-capped table of the Folgefond, a mass of lofty mountains in lat. 60° , more than 5000 feet in height, projecting into and giving a peculiar character to the grand scenery of the Hardanger Fiord, one of the finest arms of the West Norwegian sea, easily accessible from the town of Bergen. We well remember the majestic aspect of this mighty platform with its hoary summit, when seen from the Atlantic, whilst we were sailing along the shores of Norway; and can fully bear testimony, from personal inspection, to the exceeding beauty of the glacier of Bondhuus, which descends to within 1120 feet of the sea-level. Guided by John Bondhuus, a peasant farmer of a type characteristic of Norway, "a most picturesque figure—very tall and once muscular, but still erect, and with a commanding, yet mild and sombre expression of countenance—his long and thick hair hanging down his neck" (he has grown old since we saw him many years ago, but the description brings the man vividly to our memory notwithstanding), our traveller left the hamlet of Bondhuus, on the margin of the sea, and commenced his ascent at once over mounds of *débris*, the moraine of the glacier when it extended three miles beyond its present limits. We extract the account of his excursion:—

"The views are very striking; and the alpine glacier is

always the principal object, even from the sea. It descends at first gradually from the snow-fields of the Folgefond between two precipitous rocks, and falls steeply into the valley, with a slope comparable to that of the Glacier des Bossons descending from Mont Blanc. The drawing, Plate VI., shows its appearance from half-way up the valley.

“After ascending a steep mound of immense blocks—probably a moraine, but partly, perhaps, fallen from the cliffs—we come to a pretty large lake, which must be crossed in a boat; for not only are the sides nearly impassable, but they are seamed with foaming torrents which are absolutely so. Without a guide, then, we should have been completely at a loss. Old John led us to a little creek amongst the huge boulders which form the dam of the lake, where lay a miserable, leaky skiff, the larger boat being at present on the farther side, in the employ of the people who tend the cattle at a *sæter*, or *chalet*, on the high mountain pastures near the glacier. Three grown men, a boy, and a dog were quite a sufficient load for our frail bark, and I was not sorry to arrive at the farther side in safety. The view from the lake was most striking in all directions. It is situated in a deep amphitheatre of hills, well wooded to a height of, I suppose, 1500 or 2000 feet above the valley, with spots of pasture interspersed here and there. Above are bare and sterile rocks with patches of snow, and the head of the valley is closed in, as already mentioned, by the gleaming coronet of the perpetual snow-fields of the Folgefond, of which the edges generally alone appear, except where the glacier forms an outlet for the superfluity of the winter’s supply. Four or five large cascades intersect the woods with an unbroken band of foam and loud uproar on different sides. The shores of the lake are steep, strewed with blocks, and nearly impassable. The view towards the sea is milder, but equally picturesque; the valley narrows so much in that direction as almost to form a gorge, which is blockaded by the vast accumulations of *débris* already referred to, which form the barrier

of the lake, and conceal the course of the valley beyond ; but over it we have the fine forms of the bold hills, on the other side of the Moranger Fiord.

“ Arrived at length at the extremity of the lake, we ascend anew a mound of blocks, probably a moraine, immediately in front of the glacier. The torrent to which the glacier gives rise is on our left. We soon came to the *sæter*, where people tend their cows and preserve milk during summer. No one was within, but we entered and examined the rude interior of the two huts, constructed of loose, ill-fitting stones, under shelter of an overhanging rock. The arrangements were precisely such as are seen in the poorer Swiss chalets, and not at all more dirty. At last we reached the glacier, and I was surprised at the height we had ascended, in which, from a distance, I had been altogether deceived, especially by the intervention of the lake. The height above the sea (estimated by the aneroid barometer) to the foot of the ice is 1120 feet.

“ The whole appearance of the glacier is perfectly normal, and such as we find in Switzerland. The ice is thoroughly well-formed, and of as fine a blue in the cavities as I almost ever saw. A torrent issues from an arch at the bottom. The veined structure is quite well-defined and characteristic, but not greatly developed, except close to the ground, as in the Glacier des Bossons and similar cases where the glacier is not closely confined by lateral barriers towards its termination. Its inclination is steep throughout. I noticed the mark of last winter's moraine many fathoms in advance of the present limit of the ice, which however is now gaining ground afresh, driving a little moraine of five or six feet high before it. This, I presume, is the natural course of things. In spring, the melting of the ice at the foot goes on faster than is compensated by the increased velocity of downward motion of the ice ; but as the season advances, and the covering of snow is thawed, and the whole length and depth of the glacier feels the softening influence of summer, the increasing ra-

pidity of motion over-compensates the waste. The great moraine of the glacier extends up either side in the usual manner. The blocks are of very beautiful crystalline gneiss."

In lat. $61^{\circ} 5'$ are the great snow-fields of the Justedals Bræen, forming a range of fifty English miles, and flanked by notable glaciers, one of which, that of Lodal, is said to be five-and-a-half miles in length, the largest in Norway. A considerable portion of this region has never been explored by scientific travellers, and our author suggests, among other desiderata concerning the physical geography of Norway, the examination of the icy masses on the west slope of the Justedal mountains, and the selection among these glaciers of one or more suitable for careful observations of progression, both during the height of summer and from year to year. Are there no enterprising well-trained youths, fresh from our Universities, and anxious to serve the cause of science, ready to reap pleasure and reputation by settling some of the many desiderata enumerated by Professor J. Forbes at p. 245 of this book? The glaciers of the Fondalen, in lat. 66° – 67° , appear, with those of the renowned Sulitelma, to be the most important to the north of Justedal, and some of them are described as descending into the sea. Yet, important as they are, and most interesting on account of their peculiarities, they are very imperfectly known, and especially worthy of exploration. The glaciers that descend from the

snowy promontory of the Jökuls-field in lat. $70^{\circ} 2'$ also reach to the sea-margin, and include the northernmost on the continent of Europe that descend below the snow line.

The comparison which Professor Forbes has instituted between the glaciers of Norway and those of the Alps, has gone far towards strengthening the theoretical views put forward by him after careful study of the glaciers of Switzerland. His conclusions are stated so concisely and clearly that we cannot do better than quote them from his own words :—

“It results from all the observations which I was able to make in Norway (and there is that in the *physiognomy* of glaciers which enables us to form a tolerably just opinion regarding even those which I did not actually walk over), that the conditions and structure of the Norwegian glaciers are almost identical with those of Switzerland, with the exception merely of the table-like forms of the snows with which they are connected. Even the climatic influences have much in common. The elevation of the alpine valleys produces an effect analogous in many respects to the higher latitude of Norway. The intense heat of the summer days in both situations is notorious, aided in the one case (Norway) by the almost constant sunshine ; in the other (Switzerland), by the influence of height in increasing its intensity. The cold of winter is exaggerated in a similar manner in both situations. The fall of rain is no doubt very great in Norway, from its exposure to the Atlantic ; but the enormous mass of the Alps favours the formation of cloud to such an extent as nearly to compensate this. Whilst the plains of Switzerland and Piedmont have but thirty or thirty-five inches of rain annually, there falls at the Great St. Bernard (8000 feet, chiefly of course

in the form of snow) nearly sixty, and in the south-eastern Alps the fall of rain quite equals that at Bergen. Many persons will be surprised to learn that at Tolmezzo, only 1000 feet above the sea, ninety inches of rain fall. From these *data* we can perceive the strong analogy which prevails between Norway and the Alps. The chief difference is, no doubt, to be found in the shortness and greater comparative intensity of the summer heat in the north.

“Everything which I saw in Norway tends to confirm the theory of the cause of the motion of the glaciers, expounded by me some years ago, as well as the facts on which that theory was chiefly based. The leading facts attempted to be established in my former work on this subject, as results of observation, are these:—1. That the downward motion of the ice from the mountains towards the valleys is a continuous and regular motion, going on day and night without starts or stops. 2. That it occurs in winter as well as in summer, though less in amount. 3. That it varies at all times with the temperature, being less in cold than in hot weather. 4. That rain and melting snow tend to accelerate the glacier motion. 5. That the *centre* of the glacier moves faster than the sides, as is the case in a river. 6. The *surface* of the glacier moves faster than the bottom, also as in a river. 7. The glacier moves fastest (*other things being supposed alike*) on steep inclinations. 8. The motion of a glacier is not prevented, nor its continuity hindered, by contractions of the rocky channel in which it moves, nor by the inequalities of its bed. 9. The crevasses are for the most part formed anew annually—the old ones disappearing by the *collapse* of the ice during and after the hot season.

“These well-established facts give rise to certain peculiarities in the form and appearance of glaciers, which are easily recognized by one accustomed to such observations, but on which we cannot now dwell. All of these I have observed on one or other of the Norwegian glaciers.

“I conclude therefore that the differences are slight

and immaterial between the glaciers of central Europe and those of Scandinavia. The theory of their motion, which I have deduced from the facts above stated or referred to, is this :—That a glacier is a plastic mass impelled by gravity, having tenacity sufficient to mould itself upon the obstacles which it encounters, and to permit one portion to slide past another without fracture, except when the forces are so violent as to produce discontinuity in the form of a crevasse, or more generally of a bruised condition of the mass so acted on ;—that, in consequence, the motion of such a mass on a great scale resembles that of a river, allowance being made for almost incomparably greater viscosity,—hence the retardation of the sides and bottom ; finally, that diminution of temperature, diminishing the plasticity of the ice and also the hydrostatic pressure of the water which fills every pore in summer, retards its motion, whilst warmth and wet produce a contrary effect. These are the opinions which I laid down in 1842, and which ten years' experience and consideration have only tended to confirm."

To his account of the Norwegian glaciers, the author appends several journals of excursions in the high Alps of Dauphiné, Berne, and Savoy. This part of the volume may be regarded as supplementary to his former work on Switzerland. Travellers pursue so constantly the same beaten tracks summer after summer, that many of the most curious and picturesque districts of Europe, lying almost at our doors, are left unexplored. Professor Forbes has acted as a pioneer in more than one instance, and we hope his account of the grand scenery of the French Alps will induce many tourists to turn that way next summer. Well may our traveller remark that "the soil of Palestine

and Egypt is more trodden, and has been more minutely described than many parts of Europe, heedlessly passed over in the anxious haste to remove ourselves as far and as fast as possible from home associations." In every respect the French Alps offer features of striking interest, and the scenery around Mont Pelvoux, the highest summit between Mont Blanc and the Mediterranean, being 13,468 feet above the sea, is as remarkable for its sublimity as for its geological peculiarities. Yet so little thought of is this region, even by the French themselves, that in a recently published and ingenious school-map of the physical features of France which we saw at Paris this summer, the highest mountain which that country can boast of including within its limits was altogether omitted.

The geologist will find many notes highly interesting on account of the light they throw on the structure of the Alps of Dauphiné, quite independent of glacial considerations. Some of them have reference to phenomena of rare occurrence and problematical character. Such is the case described in the following passage :—

"Immediately above the village called Pied de Lautaret, two streams unite, whose courses are separated by a hill not named in Bourcet's map, but descending from the Point de Combeiron, whose sides, parallel to each ravine, form a horizontal angle varying from 60 to 90 degrees. When this promontory is viewed in front it is evident that the superior part is composed of granite or gneiss, and that the base of the whole hill is limestone. This I had

noticed in a general way in 1839, but in 1841 I quitted the road at the Col de Lautaret, and, after ascending above a thousand feet, I reached the junction of the two rocks, where the limestone dips under the gneiss at an angle of from 65 to 70 degrees. Both rocks were very materially altered at contact, but within a few feet of each other were perfectly well characterized. A similar section was obtained at *each side of the hill*; the limestone dipping under the gneiss both ways, so as to leave not a moment's doubt that we have here a cap of primitive rock overlying the secondary rocks, just as we so often see in the case of basaltic summits resting upon stratified bases. The view of the junction from Villard d'Areine (a village below the Pied de Lautaret) leaves nothing to be desired, after the nature of the rocks has been ascertained by actual inspection."

One chapter of the supplementary part of the work is occupied by a most stirring narrative of the perilous ascent of the Jungfrau, effected by Professor J. Forbes, in company with Professor Agassiz, in August, 1841. Four times, it would appear, has this majestic pyramid of rock been scaled,—twice before the expedition here described, and once since. The story is too long and continuous to admit of abstract or quotation, but we cannot forbear quoting a note appended to a portion of it, where the passage of a fearful crevasse, fissuring the base of a snowy precipice, ascending at an angle of 60° , and the scaling of which frozen wall was imperative, is graphically described:—

"In the narrative of the subsequent ascent of the Jungfrau by M. G. Studer, we find a striking account of a descent into this terrific crevasse of one of the guides, Ban-

holzer by name, above referred to. M. Studer in descending had allowed his cap to drop into the abyss—nothing would hinder young Banholzer from trying to recover it. Tied by a rope, ninety-five feet in length, he descended amidst ice walls, and overhanging masses, and gigantic icicles everywhere menacing detachment, and, when he could get no lower by aid of the rope, he detached himself; and perceiving the object of his search still below him, he quitted the rope, and clambered alone out of sight and hearing of his fellows into the dim and awful gulf. He descended in all some 120 feet, then coolly returned with his prize! The crevasse however there seemed as unfathomable as ever."

This volume, as we have already said, is beautifully illustrated. An original and extremely clear map is appended, exhibiting the distribution of the snow-fields of Norway. A number of admirable tinted lithographs, executed with remarkable skill by Mr. C. Haghe from the drawings of the author, and representing some of the chief glacial scenes in Norway, give the book a feature that adapts it as fitly for the drawing-room table as for the library. The heads of chapters are ornamented with artistic woodcuts, and the getting up of the volume is highly creditable to the enterprising publishers, who have conferred a real benefit upon science by adventuring in its publication.

The love of the chase is surely instinctive. Barbarous as the delight in the destruction of wild animals must to a certain extent be regarded, it is

natural to most men, and quite compatible with a generous and humane disposition. Indeed, take them for all in all, sportsmen and anglers are, so far as the heart goes, generally fair specimens of human character,—kind, genial, prompt to serve, and truth-telling, this last good quality being slightly modified by a pardonable tendency towards the magnifying of their personal exploits and dangers. For some years past our Nimrods have varied their pursuits by frequent excursions in the fields of literature, and bagged not a few readers of their books. The shooting season has rung with the reports of their guns, and their idle months with reports of their sanguinary proceedings. In most instances they tell their story pleasantly and well. Their narratives are easy reading, because their style is unambitious and perspicuous—two invaluable merits not much cultivated by book-makers in the present day. A man whose brains are sound and in good working order freshens his intellect when he takes to the field, whether for sport or science, and acquires a taste for plain and wholesome writing just as he learns to appreciate simple cookery. But if he remains too long in the thick and stuffy atmosphere of town clubs and libraries, his intellectual as well as physical palate becomes vitiated, and he writes his thoughts in feverish and cloudy sentences. Our author is one of the former sort.*

* *Scandinavian Adventures*. By L. Lloyd. 2 vols. Bentley.

It is now a good many years since Mr. Lloyd captivated the lovers of a well-told narrative of the chase by his book on the 'Field-Sports of the North of Europe.' At the time it appeared, Gordon Cumming had probably just emerged from that stage in the youthful sportsman's career, when his chief occupation was trying to bring down sparrows from the house-tops. Many of the mighty hunters who have of late years made the press ring with their doings were then small boys experimenting with pop-guns. Lions, hippopotamuses, antelopes, and camelopards scarcely entered into their dreams, and enjoyed the African paradise unmolested. It was in the north, and not in the south, that deeds of daring were being done, and that Mr. Lloyd was gathering hyperborean laurels by extinguishing bears, wolves, and lynxes. We doubt not that the stirring story of his doings awakened the mixed ardour of sport and adventure in the youthful bosom of many a future lion-destroyer ; and that many a noble elephant, could he trace the predestined course of his eventual doom, would discover the final cause of his demolition far to the north, by the side of Lake Wener.

Two handsome volumes, profusely though unequally illustrated, tell us what Mr. Lloyd has been doing and thinking about in the interval. It is a somewhat irregular tale, composed of a sportsman's pleasant fireside gossip, mingled with solid observations in his favourite department of natural

history. There is much that is pleasant, and something that is valuable in the book. We do not intend to be hypercritical, and prefer culling from its more interesting chapters.

And first, as best suited to the season for illustrating fairy tales, we would recommend the following wolf-anecdote to the next editor of 'Red Riding Hood, with Notes.' Wolves who could so find it in their hearts to deceive innocent little squeakers in the way that Mr. Lloyd's pet did, would have small compunction when tempted by plump little children :—

"At one time indeed I had serious thoughts of training a fine female wolf, in my possession, as a pointer; but I was deterred, owing to the *penchant* she exhibited for the neighbours' pigs. She was chained in a little enclosure, just in front of my window, into which those animals, when the gate happened to be left open, occasionally found their way. The devices the wolf employed to get them in her power were very amusing. When she saw a pig in the vicinity of her kennel, she, evidently with the purpose of putting him off his guard, would throw herself on her side or back, wag her tail most lovingly, and look innocence personified. And this amiable demeanour would continue, until the grunter was beguiled within the length of her tether, when, in the twinkling of an eye, 'Richard was himself again.'

"Whilst young, her charges were invariably directed at the rear of the animal; and, if she got hold of the tail, it was always taken off as clean as a cook would slice a carrot. Several pigs were under my own eye thus mutilated. When full-grown however she was not altogether satisfied with this fraction of a pig; and if one of a small size approached her too near, she would pitch bodily upon

it, and seizing it crosswise in her mouth, as far as the length of her chain admitted, walk backwards and forwards with it in front of her kennel. The squeaks of the sufferer were, on these occasions, awfully piercing, and I have had difficulty in relieving them from duurance. And no wonder, if the jaws of the wolf, as I have heard asserted, possess such power as to enable his teeth to penetrate a thin plate of iron."

As a pendant to this picture of abominable and deceitful conduct on the part of a domesticated wolf, we would contrast a generous action performed no longer ago than the autumn of 1850, by a bear in Osterdalen. Two women, with four children, were tending their cattle at a shealing far from home :—

"It was the duty of one of the women to tend the cattle in the forest, whilst the other occupied herself with household matters and in looking after the children. It so happened however, on the 23rd of last September, that whilst one of the women, as usual, watched the cattle, the other absented herself for a short time on a visit to her neighbour, leaving the children altogether to themselves. She had not been long away, before they perceived two large brown animals, which they took to be cows, on the outside of the fence, bordering the patch of pasture-ground contiguous to the hut. All children are curious and indifferent to danger: without consideration therefore they climbed over the fence, and made up to the creatures. When the animals became aware of the near approach of the children, the larger of the two compelled the smaller to lie down at the foot of a tall pine, and then couched by its side, as if to protect it from harm. Whereupon the least of the children—that of two years of age—without hesitation toddled directly up to the animals, and laid

itself down likewise, with its head resting on the belly of the larger one, humming at the same time some nursery-song, as if reposing on its mother's lap! The other children remained the while quiet spectators of the scene. When however the eldest had reflected a little, and had come to the conclusion that it was not a cow, but a bear—as was the fact—the child was thus toying with, she became sorely affrighted.

“Meanwhile the infant, who could not remain long in the same position, presently rose from its hairy couch, gathered some blue berries growing hard by, and gave them to its bedfellow, the bear, who immediately eat them out of the babe's hand! The child next plucked a sprig from a neighbouring bush, and offered it to the beast, which bit it in two, allowing the child to retain one half.

“The woman who had the care of the children, on returning to the shealing, saw with her own eyes the bears as they were retreating into the forest; and, when informed of the danger to which her charge had been exposed, she was horrified beyond expression.”

A very different treatment was met with by our hunter himself, when, through ill-luck, a bear got the better of him in March, 1844—a great he-brute, whose spoils are now in the British Museum, but who seems very nearly to have added Mr. Lloyd's skull and skin to his own private collection. Our intrepid sportsman had advanced within some eight or ten paces of the animal's lair, before he became aware of so close a proximity with the enemy. As the brute rose Mr. Lloyd fired, but for this once appears to have missed his aim:—

“Be that as it may, on the discharge of my gun the beast at once rushed towards me. I had still left my se-

cond barrel, with which I ought, no doubt, to have destroyed him ; but, owing to his undulatory motion, I could not, though I attempted more than once, catch a satisfactory sight ; and it was not until he was within three or four paces that I fired, and then somewhat at random. Though my ball in this or the former instance (for in the one or the other, as subsequently ascertained, it went wide of the mark) wounded him very desperately, it having entered his neck near the shoulder and passed into his body ; yet it was not sufficient, unfortunately, to stop his course, for in a second or two he was upon me—not on his hind legs (the way in which it is commonly supposed the bear makes his attacks), but on all fours, like a dog ; and, in spite of a slight blow that I gave him on the head with the muzzle of my gun—for I had no time to apply the butt—he at once laid me prostrate.

“ Had not the beast been so very near me when I fired the second barrel, it is probable, from his wounded state, I might have got out of his way ; but flight on my part, from his near proximity, was then too late ; and, once in his clutches, and, now that my gun was discharged, totally unarmed, the only resource left to me was to turn my face to the snow, that my features might not be mutilated, and to lie motionless,—it being a generally received opinion in Scandinavia, that if the bear supposes his victim to be dead, he the sooner desists from his assaults. In my case however, though I played the defunct as well as I was able, the beast mauled me somewhat severely, about the head in particular ; my body also suffered greatly from his ferocious attacks, which extended from the neck and shoulder downwards to the hip. But he did not attempt in any manner to hug or embrace me, as we in England seem to imagine his custom to be when carrying on offensive operations ; nor did he seemingly molest me in any way with his claws. All the wounds were, to my best of my belief, inflicted with his fangs.

“ This goes somewhat to corroborate the idea that com-

monly prevails in Sweden, that in attacking a man and beyond holding him fast with his claws, the bear never—in the manner of the lion or the tiger—strikes with his paw, which they say is his usual habit when making an onset on horses or cattle. If this be true, it is well; as otherwise, from the very great muscular power of his arm, annihilation would probably quickly follow the blow. But after all, no inference can fairly be drawn from my case, as the beast's forbearance towards me might have arisen simply from my remaining quite passive. Had I, on the contrary, been on my legs, and offered resistance, I might possibly have felt, not only the weight of his paws, but the pressure of his embraces.

“Neither at the time of receiving my first fire, nor whilst making his rush, did the bear, as is usually the case when enraged, utter his usual half-roar, half-growl. Even when I was lying at his mercy, no other than a sort of subdued growl, similar to that of a dog when disturbed whilst gnawing a bone, was made by the beast; and so far from coming at me with open jaws, as one would suppose to be the case with a wild beast when making his onset, his mouth at the time was altogether closed.

“The pain I suffered from his long-continued attacks on my body was bearable. When he had my limbs in his jaws, it more resembled their being stuck in a huge vice than anything else; but when his jaws grasped, as they did, the whole crown of my head—during which I distinctly felt the fleshy part of his mouth to overlap my forehead—and his fangs very deliberately scored my head, my sufferings were intense. The sensation of his fangs slowly grating over the bare skull, was not at all that of a sharp blow, as is often the case when a wound is inflicted, but rather, though very much more protracted, the craunch one feels during the extraction of a tooth.

“From certain circumstances, I have reason to believe the bear continued to maltreat me for nearly three minutes. As I perfectly retained my senses the whole time, my

feelings, whilst in this horrible situation, are beyond the power of description. But at length the incessant attacks of my gallant little dog drew the beast's attention from me, and I had the satisfaction to see him retreat, though at a very slow pace, into the adjoining thicket, where he was at once lost to view."

This was indeed a providential escape ; and though severely mauled, the huntsman was able to make his way, some seven or eight miles, to his quarters, and, with an effort, to take the field again four days afterwards. Had it not been for his wearing his hair closely cropped, he would certainly have been scalped. May the shaven head of the Grand Turk come as safely out of the clutch of the Great Bear of Russia !

The woodcuts of animals in these volumes are very beautiful, and would be worthy of the works of Bell and Yarrell. Some of the landscapes, as we can testify, having visited the scenes, are truthful and spirited. The historical plates, representing adventures in the life of Gustavus, do not deserve praise, and, as well as the episode they illustrate, might have been omitted with advantage to an interesting work in which they are certainly out of place.

VIII.

SKETCHES OF TRAVEL IN AMERICA.

MANY causes are combining to give great importance to the States of Central America. Their own fertility and natural advantages, the commerce of the Pacific, and the gold of California, unite to attract the earnest attention of enterprising men and politicians towards them. At the present moment, the appearance of this full and able account of Nicaragua is peculiarly well-timed.* The writer of it describes himself as “late *chargé d'affaires* of the United States to the Republics of Central America.” His official position has evidently enabled him to get at much information that would otherwise have been inaccessible. His name is well and favourably known to ethnologists and antiquarians by his researches into the history of the aboriginal monuments of the United States, and by his very curious, though somewhat fanciful, essay on ‘The Serpent Symbol, and the Worship

* *Nicaragua; its People, Scenery, Monuments, and the Proposed Inter-oceanic Canal.* By E. G. Squier. Longman and Co.

of the Reciprocal Principles of Nature in America.' The bias and extent of his studies make him a very competent person to investigate the antiquities of Nicaragua. The chapters devoted to this subject in the work before us are full of interest, and highly to be valued for the abundance of fresh observations they contain. Like many American archæologists and historians, Mr. Squier is inclined to over-estimate the peculiarities and antiquity of the aborigines of the New World. If we understand rightly, he claims for them an independent origin. His ethnology is of the romantic school, and rather loose. His imagination gets the better of his reasoning, and his 'organ of wonder,' to speak in the manner of phrenologists, is over-developed. His habits of mind and training do not seem to be such as to qualify him for strict scientific research. He is more of the *littérateur* than the philosopher. His writings are, in consequence, very amusing, but require to be dealt with cautiously. The facts must be winnowed from the fancies with which they are mingled, if we wish to use them for scientific purposes.

Imaginative men are usually warm lovers and fierce haters. Our American envoy's appreciation of female charms is so intense, that he cannot pass a pretty woman without inscribing a memorandum respecting her in his note-book, afterwards to be printed more at length with additional expressions of admiration. A pair of black eyes cannot sparkle

behind a lattice without being duly recorded. His affection for the ladies is only equalled by his dislike of the 'Britishers.' The handsomest girl and the ugliest idol could scarcely distract his thought from the vices and crimes of England and the English. If he is to be trusted, the whole population of Central America regards every Englishman as a bitter enemy. He paints us in the blackest hues, and prophesies the fall of England with undisguised delight. Bluster about Britain is the prominent fault of the book, and one for which the writer will, when he knows more about us, be ashamed of himself. Every day it is becoming more and more the interest of Englishmen and Americans to pull together. Consanguinity and the love of constitutional liberty are strong ties. They may be forgotten for a time, but in the end must work uppermost. Recent events have done much to remind us of our near relationship with our transatlantic cousins, and them of the Anglo-Saxon blood to which they owe their pre-eminence among the nations of the New World. The grasping and interfering qualities that bring down upon us the unmitigated censures of Mr. Squier are quite as prominently manifested in the doings of his countrymen; and whilst in one chapter he censures our meddlings with, and claims upon, the Mosquito shore, in another he anticipates something very like the annexation of all Central America to the United States.

The Mosquito country, about which we have seen of late so many very unsatisfactory paragraphs in our newspapers, is a thinly populated and most unhealthy tract on the Atlantic sea-board of Central America. It is inhabited by a mixed breed of Indians and Negroes, supposed to be ruled by a semi-civilized individual, who rejoices in the entomological title of King of the Mosquitoes, one by no means inappropriate, considering the amount of small annoyance we have endured through disputes about his territory. He is supposed to be under British protection,—it is difficult to understand exactly why. The main purpose we have in view seems to be the securing a proper supply of the peculiar hard woods of this region. Britons at home generally make peace over their mahogany; abroad they seem to pick quarrels over it.

Central America includes an area of 150,000 square miles. Under Spanish dominion it was divided into the provinces of Guatemala, Honduras, San Salvador, Nicaragua, and Costa Rica. These became independent states in 1821, and subsequently united to form the 'Republic of Central America.' They separated again in 1839, into so many distinct republics. Nicaragua, Honduras, and San Salvador have recently confederated. The entire region of Central America presents very marked and important physical features. These are the great plain, six thousand feet above the sea, upon which stands the city of Guatemala;

the high plain forming the centre of Honduras and part of Nicaragua; and the elevated country of Costa Rica. Between the two latter lies the basin of the Nicaraguan Lakes, with broad and undulating verdant slopes broken by steep volcanic cones, and a few ranges of hills along the shores of the Pacific, intermingled with undulating plains. Of the two great lakes, the lesser, Managua, is 156 feet, and the larger, Nicaragua, 128 feet above the Pacific Ocean. The former is fifty or sixty miles in length by thirty-five wide, the latter above a hundred miles long by fifty wide. On or near their western borders are the chief cities of the country. Enormous isolated volcanic cones rise to the height of from 4000 to 7000 feet in their neighbourhood or on the islands that stud them. Numerous remains of antiquity, ruins of temples, and deserted monolithic idols, give interest to their precincts, whilst the scenery is described as being surpassingly grand and beautiful. The sole outlet is the river San Juan, a magnificent stream flowing from the south-eastern extremity of Lake Nicaragua, for a length of about ninety miles, into the Atlantic. The climate is generally healthy, more especially towards the Pacific side. Nicaragua is inhabited by a population of about 260,000, one half of which, or more, is composed of mixed breeds; Indians, in great part civilized, coming next in number; then whites, of whom there are about 25,000; and, lastly, some 15,000 Negroes. They

live chiefly in towns, and cultivate the soil, which is very productive, and capable of supporting a much larger population. The natural resources of Nicaragua appear to be very great. Sugar, cotton, coffee, indigo, tobacco, rice, and maize are the chief productions. There is, besides, great mineral wealth. In ancient times the aborigines appear to have occupied considerable cities, and to have attained a civilization comparable with that of the Mexicans. Indeed Mr. Squier has proved, by philological and other evidence, that a Mexican colony did exist in Nicaragua at the period of the discovery of the country in the fifteenth century. This had been surmised before, but not clearly made out.

Much interest attaches to the population of Nicaragua, on account of the large proportion of families of Indian blood, pure and mixed, of whom it is made up. The qualities which enabled the ancient Indian people of Mexico, Central America, and Peru, to become civilized nations after a peculiar fashion, are not extinct, and seem to be retained and re-developed in proportion to the prevalence of Indian over Spanish blood. The Indians of Nicaragua are remarkable for industry and docility; they are unobtrusive, hospitable, and brave, although, fortunately for themselves, not warlike. They make good soldiers, yet have no morbid taste for the military profession. The men are agriculturists; the women occupy themselves with the

weaving of cotton, and make fabrics of good quality and tasteful design. It is interesting to find the Tyrian dye still employed in their manufactures. They procure it from a species of *Murex* inhabiting the shores of the Pacific. They take the cotton thread to the sea-side, where, having gathered together a sufficient quantity of shell-fish, they patiently squeeze over the cotton the colouring fluid, at first pellucid and colourless, from the animals, one by one. At first the thread is pale blue, but on exposure to the atmosphere becomes of the desired purple. This colour is so prized that purple thread dyed by cheaper and speedier methods, imported from Europe, cannot supplant the native product. With mingled humanity and thrift they replace the whelks in their native element, after these shell-fish have yielded up the precious liquor for which they were originally gathered. The Indian population also exclusively manufacture variegated mats and hammocks from the Pita, a species of Agave, and are as skilful as their ancient ancestors in the making of pottery. They do not use the potter's wheel. Politically they enjoy equal privileges with the whites, and all positions in church and state are open to them. Among them are men of decided talent. Physically they are a smaller and paler race than the Indians of the United States, but are well developed and muscular. Their women are not unfrequently pretty, and when young are often very finely formed.

Happily in Nicaragua no distinctions of caste are recognized, or, at any rate, they have no influence. Such of the people as claim to be of pure Spanish blood are, in most instances, evidently partly of Indian descent. The Sambos, or offspring of Indian and Negro parents, are a fine race of people, taller and stronger than the Indians.

Mr. Squier's admiration for the gentler (in Nicaragua we can scarcely say the *fair*) sex, has led him to picture very vividly the charms and appearance of the ladies he encountered during his travels. The following is a precise and tempting description :—

“ The women of pure Spanish stock are very fair, and have the *embonpoint* which characterises the sex under the tropics. Their dress, except in a few instances where the stiff costume of our own country had been adopted, was exceedingly loose and flowing, leaving the neck and arms exposed. The entire dress was often pure white, but generally the skirt, or *nagua*, was of some flowered stuff, in which case the *guipil* (*Anglicè*, vandyke) was white, heavily trimmed with lace. Satin slippers, a red or purple sash wound loosely round the waist, and a rosary sustaining a little golden cross, with a narrow golden band or a string of pearls extending around the forehead and binding the hair, which often fell in luxuriant waves upon their shoulders, completed a costume as novel as it was graceful and picturesque. To all this, add the superior attractions of an oval face, regular features, large and lustrous black eyes, small mouth, pearly white teeth, and tiny hands and feet, and withal a low but clear voice, and the reader has a picture of a Central American lady of pure stock. Very many of the women have however an infusion of other families and races, from the Saracen to the Indian and the

Negro, in every degree of intermixture. And as tastes differ, so may opinions as to whether the tinge of brown, through which the blood glows with a peach-like bloom, in the complexion of the girl who may trace her lineage to the caziques upon one side, and the haughty grandees of Andalusia and Seville on the other, superadded, as it usually is, to a greater lightness of figure and animation of face,—whether this is not a more real beauty than that of the fair and more languid señora, whose white and almost transparent skin bespeaks a purer ancestry. Nor is the Indian girl, with her full lithe figure, long glossy hair, quick and mischievous eyes, who walks erect as a grenadier beneath her heavy water-jar, and salutes you in a musical, impudent voice as you pass,—nor is the Indian girl to be overlooked in the novel contrasts which the ‘belo sexo’ affords in this glorious land of the sun.”

The Nicaraguan ladies occupy themselves with smoking and displaying little feet in satin slippers when daily they go to church and back. In the early evening they occasionally pay visits, and if a number of both sexes happen to assemble at the same house a dance is improvised, though regular parties or balls are rare and ceremonial. How they dance is thus told by Mr. Squier :—

“We were witnesses of a tertulia at our own house the second evening after our arrival. A dozen señoras casually found themselves together, a dance was proposed by the gallants loitering at the balconies, and the proposition meeting with favour, they at once dispersed to bring in recruits and the ‘musicos.’ In an hour the grand sala was filled. The females as they came in were all ranged on one side of the room, and the males on the other. This looked rather stiff, and I began to fear that a *tertulia* was no great matter after all. Directly, however, a single

couple took the floor; the music struck up, and as they moved down the room, the measure brought the lady first on one side, and then on the other. As she passed, she alternately tapped a señor and señora on the shoulder with her fan, thus arbitrarily determining the partners, who were obliged at once to join in the dance. In this manner the whole party was brought to its feet, *nolens volens*,—and such I found was a frequent mode of opening the tertulia. After the first set is over, the ice once broken, and the excitement up, the gallants are permitted to exercise a choice. I thought the practice a good one, obviating a great deal of awkward diplomacy at the outset, and putting every one very speedily at their ease. As the evening progressed the party augmented, and before ten o'clock we had got together the *élite* of Leon. All joined heartily in the spirit of the affair, and when the bell of the cathedral tolled eleven, I think I never saw a more animated assemblage. The polka and the waltz, as also the bolero, and other well-known Spanish dances, were all danced gracefully and with spirit; and besides these, after much persuasion, we had an Indian dance,—a singular affair, slow and complicated, and which left upon my mind a distinct impression that it was religious in its origin. After the dancing, we had music; but beyond the national air, which was given with force and spirit, I cannot say much for the singing.

“During the whole evening the windows were festooned with urchins, and the doors blockaded by spectators, who, when they were particularly pleased, applauded tumultuously, as if the whole affair had been got up for their special entertainment. The police would have driven them off, but I won an enduring popularity by interceding in their behalf, and they were consequently permitted to remain. Upon the occasions of the more formal balls subsequently given, soldiers were stationed at every entrance, and the crowd kept at a distance.”

At festival seasons the Nicaraguans have some

curious customs, apparently derived from their ancient heathen worship :—

“The fiesta of St. Andrew was celebrated with some novel features, and particularly commended itself to the muchachos. It was signalized by ‘un bayle de los demonios’ (a dance of the devils). The devils were dressed in the most fantastic manner, wore masks, and sported barbed tails. One shrouded in black displayed a grinning death’s head beneath his half-parted veil, and kept time to the music with a pair of veritable thigh-bones. The dance, I should think, had been borrowed from the Indians; the music certainly was. It was almost unearthly, such as Cortez describes on the night of his retreat from Mexico, ‘which carried terror to the very souls of the Christians.’ It is impossible to describe the strange instruments. One consisted of a large calabash, over which was stretched the skin of some animal; this, when pressed in, recoiled with a dull, sullen noise, like the suppressed bellow of a wild beast, and the wail of some of the long reeds was like that of a man in the agonies of a violent death. The devils went whisking through the principal streets, followed by a gaping crowd, and entered all the principal houses, where, after a dance in the courtyard, they expected either to receive a rial or two, or to be treated to a dram of *agua ardiente*. They favoured me with an extra display of their demoniacal abilities,—but were high-spirited devils, and declined to receive money from a stranger.

“Another class of dancers, dressed in a profusion of tinsel, but not aspiring to the distinction of devils, parade the streets on certain saints’ days, visiting all the houses where the heads of the family bear the name of the saint, where they expect a gratuity or a treat, in return for an exhibition of their skill. As I soon lost all track of the saints, I do not remember which were supposed to be propitious to this kind of diversion.”

In some of the Nicaraguan towns, especially in

Leon, the pernicious practice of burying the dead within the walls of city churches is persisted in, even as in London, and, just as with us, against the opposition of all sensible persons, including the Government itself. Fees to the church and attendant officials are at the root of the evil, and give it a vitality that defies all attempts at eradication. The priests of Leon have evaded all edicts about this nuisance, and have improved upon the practice of our metropolitan parishes; for, not content with the revenues they derive from funerals, they charge according to the length of time (from ten to twenty-five years) the dead are to be permitted by them to rest in their graves. When the purchased time is up, the bones and the earth derived from the decomposed corpses are removed and sold to the manufacturers of nitre! The least warlike of citizens may thus in the end become a defender of his country, when converted into a constituent of gunpowder. The most quiet and unambitious of mortals may complete his career by making a noise in the world, when fired off from a mortar. Assuredly this is a very novel and original method of shooting churchyard rubbish, and we recommend a fair consideration of it to our vested parochial authorities.

Mr. Squier claims to be the first person who has described the ancient monuments of Nicaragua, or, indeed, to have indicated their existence. Excellent and numerous plates and cuts of these very

interesting though rather frightful relics are given in his work. Hitherto the antiquities of the northern portion of Central America only have been explored, and are familiar to us through the researches of Stephens and of Catherwood. The Indians still reverence the shrines and statues of their ancient gods, and are apt to conceal their knowledge about their localities and existence. Those described by our traveller have mostly suffered dilapidation through the religious zeal of the conquerors. They appear to differ among themselves somewhat in degree of antiquity, but there is no good reason—this is the conclusion to which Mr. Squier comes—for supposing that they were not made by the nations found in possession of the country. The structures in or about which they were originally placed were probably of wood, and great mounds and earthworks, like the teocallis of Mexico, were associated with them.

A section of Mr. Squier's work is devoted to an elaborate dissertation on the proposed interoceanic canal, illustrated by an excellent map. We recommend these chapters to the consideration of all who are interested upon this important subject. Like most parts of his book, it is defaced by not a few sneers at, and misstatements about, the English. About the bad taste of these outbursts we shall not say more. That they should come from a man who is professionally a diplomatist is evidence of his indiscretion and unfitness for his poli-

tical calling. As an amusing traveller and diligent antiquarian, however, we can do Mr. Squier full honour, and were glad to see the just compliment lately paid to him in London, when our Antiquarian Society elected him an honorary member.

A narrative of travels, well written by a competent observer, is among the most delightful of books. A clear-headed man, who can wield a pen with sufficient tact and skill, is sure to make his description, even of a hackneyed place, readable and interesting. But a would-be smart or sapiently dull account of a journey over well-trodden ground, or even through some seldom-visited country, is an infliction not to be endured, and alike deleterious to the reader's temper and his health; for ill-humour breeds indigestion, out of which spring malice, uncharitableness, and doctors' bills. The books before us have very nearly made us angry and ill.* Their authors have nothing new to tell; they appear to have been utterly unqualified for making observations on the scenery and productions of the countries through which they passed; they profess, indeed, to record only the daily scenes of national manners and peculiarities that meet the eye of the traveller at every turn. This single aim may war-

* *Recollections of a Ramble from Sydney to Southampton.* Bentley.

Transatlantic Rambles. By a Rugbæan. Bell.

rant the production of a book by a witty or brilliant writer, whose power of placing ordinary things in new lights, or of embalming commonplace reflections in sparkling sentences, gives a life and zest to his story. But without such power, a man has no right to bore the public merely because he has steamed, or sailed, or ridden, or coached over several thousand leagues of foreign land and sea. Let us suppose that all sea-captains, couriers, and Queen's messengers, who have scoured over earth and ocean, were therefore to consider themselves, whether literate or illiterate, bound to bring forth books about their wanderings, what would become of us ! The crust of the earth could not bear the weight of an accumulation of such productions as the two histories of ' Rambles ' (even though they be each in one not very large volume) whose titles head this notice. They are samples of a class of books unfortunately multiplying in an alarming manner, and likely to be considerably swollen when the aldermen, who have lately explored the Continent, publish the results of their tours. We are almost tempted to wish for the general war and universal revolution announced for 1852, in the hope that our native ramblers may thereby be forced to stay at home, and not suffered to go at large making notes in foreign parts, and bad books on their return.

The author of the first of these works tells us how he made a roundabout journey from Sydney

to Southampton, making his way along the west coast of South America, and on through the West Indies and United States to Niagara, where he had some fears that he might go over the Falls. Had his note-books gone over, we might have been saved some weary hours. Most of our readers have probably, at some period in their lives, felt the dismal delight of being enlivened in spite of themselves by the loquacity of a smart but somewhat heavy man, who insists on joking and being severely funny. Should they wish to be reminded of this pleasure, let them read the 'Recollections of a Ramble.' To prove that we are not saying more than is just, here is the opening paragraph:—

“Finding myself in Sydney—reader, do not drop the book as if it was red-hot; I did not go out in the ‘riglar’ way, as it is called; business took me there—and as it was necessary for me to get back to England once more, the difficulty of choosing my route homewards presented itself. I liked not the idea of the usual voyage round Cape Horn, with its accompaniments of blue noses, frost-bitten fingers, chilblains, and only four hours of equivocal daylight; and this delightful state of things lasting perhaps five or six weeks—bah! I would almost rather have remained a ‘lifer’ at Sydney. Some of my friends proposed the journey home *viâ* India, Egypt, and the Mediterranean; but I had seen Calcutta some years previously, and the Mediterranean and Egypt are so easily accessible from England in this age of steam, that a traveller may in ten days after leaving England enjoy his cigar and pot of stout at the Pyramids; and I considered that I could visit the Mediterranean at some future time—besides, a tour up the Mediterranean is now about as snobbish an affair as a voyage to Gravesend and back.”

It must be a bad book indeed, that does not yield some paragraph worth quoting, and suggestive of something worthy of imitation. The Sydney-Southampton tourist, wherever he went, very laudably inspected the theatres. At Havannah, he saw one of the finest in the world ; at Valparaiso, he discovered a contrivance which, we hope, will be duly adopted by our London managers after they have perused this number of the 'Literary Gazette.' Who that is a playgoer has not been puzzled, annoyed, baffled, and eventually rendered utterly miserable, by that most hideous of contrivances, his own hat ? It is a nuisance in the pit, a torment in the stalls, and a pest in the boxes. It is true that some of the discomfort may be removed by wearing a *gibus* ; but who can adopt that dismal skeleton, whose aspect reminds one of the ghost of a decorticated beaver, and run the risk of alienating the affections of his wife, and exciting the ridicule of his small children ? No man in a *gibus* ever commanded public awe or private respect. A bachelor in the last stage of despondency may crown his aching brows with a mechanical *chapeau*, but a Benedict dare not. They manage their hats better at Valparaiso :—

“The theatre is of rather large dimensions, and the fronts of the tiers of boxes and gallery, instead of paneling, as in our English theatres, consist of balustrading, painted white, with gold mouldings, and the effect is exceedingly light and pretty, as well as cool. The seats in the pit are all divided by arms, and each seat lifts up and

discloses a small box, in which to place the hat of a person occupying it—a very capital contrivance. The seats are called *lunetas*, and may be hired by the year or for the evening. They are all numbered; and as only the same number of tickets are issued as correspond with the number of the sittings, the place is never inconveniently crowded. The acting, as far as I could judge, not being very conversant with the language, appeared quite to equal the generality of performances in England, and some solos on the ophicleide, clarionet, and violin were excellent.”

The traveller visited churches as sedulously as theatres. Of the many he noticed, the cathedral at Lima is the most interesting; and the account he gives of the present condition of the mortal remains of the conqueror of Peru is curious:—

“Today I visited the cathedral; it is of great extent, and completely free from the tinsel and tawdry rubbish with which the other churches in Lima are so crammed,—no paralytic figures of virgins and goggle-eyed saints, apparently taken from the collections of innumerable Punch and Judy shows.

“The interior of this building is really magnificent: it is divided into a large centre, and two side aisles, by rows of massive pillars. The centre division is raised some feet from the floor, and ascended by steps running the whole length; the pillars are hung with crimson velvet, bordered with gold lace; the altar is of great height and breadth, the whole of it, as well as some columns rising each side, being plated with silver of considerable thickness; the aisles on each side contain many shrines and chapels, each enclosed by a handsomely ornamented gate.

“In the crypt under the high altar are deposited the remains of the celebrated Pizarro, who was assassinated in the palace close by. A small piece of silver, dropped into the hand of the sacristan, procured me admission into the

crypt. Descending a few steps, I entered a small place, some twenty feet long, quite light and whitewashed, and which smelt and looked so much like a comfortable wine-cellar, that I caught myself more than once looking round for the bins and bottles. The first object that I saw was a large square tomb surmounted by the erect figure of an abbot, and close by, in a narrow opening in the wall, I noticed what appeared to me to be a collection of dusty rags, but a closer inspection proved that this was all that remained of the renowned conqueror of Peru. He has still on him the clothes and shoes which he wore at the moment of his assassination. Of course his body is nothing but a skeleton covered with dried flesh and skin, so that no features are discernible. The body is covered with the remains of what was once white linen, swathed round him, but the dust of centuries has collected on it and turned it to a light brown colour, and it almost pulverizes when touched. The body is placed on a narrow piece of plank, in a sloping position, and has been placed in this hole merely to put it out of the way.

"The folks in Lima do not think anything of the remains of poor Pizarro, and I dare say that a little money, judiciously invested, would procure for any curiosity-hunter the whole of his remains. I had a strong notion of giving a few dollars to the sacristan to let me walk off with the skull."

That part of the book devoted to the United States contains the usual stories about Lynching, chewing, and other American virtues. We fancy that most of them are old tales.

The "Rugbæan" is a sad proser, and tells all his stories in a breath without stopping. He mixes up his subjects in the strangest and most ladies'-maid-like manner. We shall venture on a single

quotation only from his book, a notice of the factory people at Lowell :—

“I went off early the next morning to have a day at Lowell, the Manchester of the United States. It however only resembles its great prototype so far as the trade is concerned ; everything else about it is in strong contrast, and it seems the veritable fairy-land of factories. There is no smoke (water-power being used universally), no dirt, no poverty, no wretchedness ; everybody and everything else about it betokens happiness, cleanliness, and a full enjoyment of the comforts of this life. I watched a crowd of young workpeople going to their dinner, and was perfectly astounded. Instead of the hatless and shoeless crowd which rattle along the streets of England with tins in their hands, an orderly set of young ladies and gentlemen, the former dressed in smart shawls and visites, and worsted or straw bonnets with long green veils (one had a *chatelaine*), and the latter in Wellington boots, glazed caps, and Chesterfield coats, are to be seen sauntering homewards, conversing, not in the language which would emanate from the lips of English piecers and winders, but on topics of deep interest, generally politics. I followed some of the girls, at a distance, to their lodgings, —beautiful red brick houses of two stories in height, and caught glimpses of them through the windows. One of them positively laid aside her shawl, put on a light, easy dressing-gown, dropped into a luxurious arm-chair, and began to con over a novel ; while from another room I heard, almost simultaneously, the opening notes of a tune on the piano. These girls usually earn from $2\frac{1}{2}$ to $5\frac{1}{2}$ dollars per week (from nine to twenty shillings), and living is about half what it is in England. The population of Lowell is estimated at 35,000. There is a valuable library of 7000 volumes belonging to it, to which any one can have access by paying fifty cents (2s. 1d.) per annum.”

Thousands of young Englishmen start yearly on

their travels with no other purpose than the search for information and amusement. The majority of them are intelligent, and, according to the fashion of our country, well educated. Unfortunately, our systems of education do not furnish the knowledge or the training necessary for the making of an accomplished traveller. Districts, the accounts of which in our geographies are lamentably inaccurate and imperfect, are yearly traversed by our young and active countrymen without gain or result. Now and then a traveller, more energetic than his companions, finding when he reaches home that he has been wandering over new and interesting ground, re-writes his journal and publishes a volume. But beyond personal adventure and superficial notices of the manners and costume of the natives, the contents are such as fail to supply the required information. Were our young men of fortune to prepare themselves beforehand, by learning how to determine the relative position of places, and to delineate the physical features of the country through which they are passing, by acquiring a knowledge of the elements of geology and natural history, and the methods of observing in those delightful sciences, and by making themselves acquainted with the historical and ethnological facts and questions connected with the regions they propose to visit, how delightful would their tour become to themselves ! how valuable would the results of it prove to literature and science !

This is an American book, and a good one.* It is marked by the characteristics of the opening literature of the New World, images and reflections derived from scenes and people very different from those we see around us in Europe, mingled with recollections and sympathies that may be traced to the Old World and its authors. There is an abruptness in the style, and at times a harshness—we had almost said, a nasal twang—in the sentiments, that grate occasionally, though for a moment only, on our antiquated tastes. Here and there ‘affectations’ are obtrusive and unwelcome. But these defects are small and few compared with the merits,—the freshness, heartiness, and earnestness that are manifest in every page—qualities that have sold 10,000 copies of these ‘Reveries’ within a year, and attracted ten times as many readers. When Americans pause in the midst of their dollar-hunting to think and dream over fanciful essays such as these, there must be much good in them, capable of charming the head and interesting the heart. Nor is it difficult to trace the source of the excellence. The kernel of the book lies full and sweet beneath a thin and easily broken, though fantastically carved shell. Its substance is made out of thoughts and fancies that pass through the brain, and flit before the mind’s eye, of every thinking man whose soul is betimes

* *Reveries of a Bachelor ; or, a Book of the Heart.* By Ik. Marvel. New York : Scribner. London : John Chapman.

permitted to master and forget his body. But every man cannot track his thoughts to their origin, or follow his fancies to their vanishing, however he may long to do so. This is a power given to the few only, and those who exercise it have a strong hold on human affections. This our Bachelor has done, and acquires his reward in the pleasure he has given to thousands, who have felt, when reading his book, that the reveries he has therein so skilfully calotyped are the day-dreams in which they have themselves delighted.

We were bachelors once, and not so very long ago but that we can sympathize with Mr. Marvel. The recollection of our dreamings when in that transition or caterpillar state, is still sufficiently vivid to enable us to compare the reveries of a transatlantic bachelor with those indulged in by the unblest of the Old World. In our character of Benedict, we can make such comparisons calmly—as free from disturbing emotions as a botanist when comparing two roses or two thistles. It is pleasant to find that the bachelors of both continents are members of one and the same species, presenting unquestionable marks of identity. And what is the peculiarity of bachelorhood? It is the yearning after love returned—the craving for marriage, the longing for woman's companionship. Surround a bachelor with every possible comfort; give him the roomiest of bedchambers, the most refreshing of couches, the largest of sponging

baths ; cover his breakfast table with the whitest of tablecloths, make his tea with the hottest of boiling water ; envelope his body in the most comfortable of dressing-gowns, and his feet in the easiest of slippers ; feed him amid the luxuries and comforts of the snugest of clubs ;—do all these things and more for him, and he will nevertheless be unhappy. He mopes, and ponders, and dreams about love and marriage. His imagination calls up shadow wives, and he fancies himself a Benedict. In his dream he sees a fond and charming lady beside his solitary hearth, and prattling little ones climbing up his knees. He wakes to grow disgusted with his loneliness, and, despairing, vents his spleen in abuse of the very condition for which waking and sleeping, he longs and pines.

The burden of these ‘ Reveries ’ is love ; the love of the boy, of the youth, and of the man ; love hopeful and love disappointed ; first love and last love ; true love and false love. The bachelor sits over his wood fire, and lights his cigar and thinks ; his every thought turns love-wards. He calls up the past, and its memories of the childish beauties that enchanted his boyhood ; he fills up the future now with hopeful dreams of mutual affections, now with gloomy nightmares of blighted longings. The phases of his wood fire—the crackle of the logs and the dark smoke curling from the green wood ; the full blaze that follows ; the flickering flame and crumbling of the dying ashes, all suggest vari-

ations on the same undying theme. So do the fuel of his town fire, whether sea-coal or anthracite, the lighting of his cigar, and the phases of the day. Very delightful are the reveries that each suggest.

The introduction of the reverie 'over a wood-fire' will serve as a good example of the object-painting in which these essays are so rich, and of the distinctive local colouring that tinges them:—

"I have got a quiet farmhouse in the country, a very humble place to be sure, tenanted by a worthy enough man; of the old New England stamp, where I sometimes go for a day or two in the winter, to look over the farm-accounts, and to see how the stock is thriving on the winter's keep.

"One side the door, as you enter from the porch, is a little parlour, scarce twelve feet by ten, with a cosy looking fireplace, a heavy oak floor, a couple of arm-chairs, and a brown table with carved lions' feet. Out of this room opens a little cabinet, only big enough for a broad bachelor bedstead, where I sleep upon feathers; and wake in the morning, with my eye upon a saucy-coloured lithographic print of some fancy 'Bessy.'

"It happens to be the only house in the world of which I am *bonâ fide* owner; and I take a vast deal of comfort in treating it just as I choose. I manage to break some article of furniture almost every time I pay it a visit; and if I cannot open the window readily of a morning, to breathe the fresh air, I knock out a pane or two of glass with my boot. I lean against the walls in a very old arm-chair there is on the premises; and scarce ever fail to worry such a hole in the plastering, as would set me down for a round charge for damages in town, or make a prim housewife fret herself into a raging fever. I laugh out loud with myself, in my big arm-chair, when I think that I am neither afraid of one nor the other.

“As for the fire, I keep the little hearth so hot, as to warm half the cellar below; and the whole space between the jambs roars for hours together with white flame. To be sure, the windows are not very tight, between broken panes and bad joints, so that the fire, large as it is, is by no means an extravagant comfort.

“As night approaches, I have a huge pile of oak and hickory placed beside the hearth; I put out the tallow candle on the mantel (using the family snuffers, with one leg broke); then, drawing my chair directly in front of the blazing wood, and setting one foot on each of the old iron fire-dogs (until they grow too warm), I dispose myself for an evening of such sober and thoughtful quietude, as I believe, on my soul, that very few of my fellow-men have the good fortune to enjoy.”

The smoke of the wood-fire signifies *doubt*; its blaze is *cheer*; its ashes are *desolation*. We quote the conclusion of the reverie suggested by the blaze,—a vision of a sweet wife and rosy, fair-haired children, with all their attendant joys and comforts, the thought of which has worked our bachelor into an ecstasy:—

“The blaze was leaping light and high, and the wood falling under the growing heat.

“——So, continued I, this heart would be at length itself;—striving with everything gross, even now as it clings to grossness. Love would make its strength native and progressive. Earth’s cares would fly. Joys would double. Susceptibilities be quickened; love master self; and having made the mastery, stretch onward, and upward toward Infinitude.

“And if the end came, and sickness brought that follower—Great Follower—which sooner or later is sure to come after, then the heart and the hand of love, ever near, are giving to your tired soul, daily and hourly, lessons of

that love which consoles, which triumphs, which circleth all, and centereth in all—Love Infinite, and Divine!

“Kind hands—none but *hers*—will smooth the hair upon your brow as the chill grows damp and heavy on it; and her fingers—none but *hers*—will lie in yours as the wasted flesh stiffens and hardens for the ground. *Her* tears,—you could feel no others, if oceans fell,—will warm your drooping features once more to life; once more your eye lighted in joyous triumph, kindle in her smile, and then——

“The fire fell upon the hearth; the blaze gave a last leap—a flicker—then another—caught a little remaining twig—blazed up—wavered—went out.

“There was nothing but a bed of glowing embers, over which the white ashes gathered fast. I was alone, with only my dog for company.”

Not less cheering are some of the thoughts called up by the fire of anthracite that warms him in his city residence; witness the following picture of what a home is:—

“A home!—it is the bright, blessed, adorable phantom which sits highest on the sunny horizon that girdeth Life! When shall it be reached? When shall it cease to be a glittering day-dream, and become fully and fairly yours?

“It is not the house, though that may have its charms; nor the fields carefully tilled, and streaked with your own foot-paths;—nor the trees, though their shadow be to you like that of a great rock in a weary land;—nor yet is it the fireside, with its sweet blaze-play;—nor the pictures which tell of loved ones, nor the cherished books,—but more far than all these—it is the PRESENCE. The Lares of your worship are there; the altar of your confidence there; the end of your worldly faith is there; and adorning it all, and sending your blood in passionate flow, is the ecstasy of the conviction, that *there* at least you are

beloved ; that there you are understood ; that there your errors will meet ever with gentlest forgiveness ; that there your troubles will be smiled away ; that there you may unburden your soul, fearless of harsh, unsympathizing ears ; and that there you may be entirely and joyfully—yourself !

“ There may be those of coarse mould—and I have seen such even in the disguise of women—who will reckon these feelings puling sentiment. God pity them !—as they have need of pity.

“ —That image by the fireside, calm, loving, joyful, is there still ; it goes not, however my spirit tosses, because my wish, and every will, keep it there, unerring.

“ The fire shows through the screen, yellow and warm as a harvest sun. It is in its best age, and that age is ripeness.”

Nor are the thoughts that cluster about the dying embers to be passed over :—

“ Cares cannot come into the dream-land where I live. They sink with the dying street-noise, and vanish with the embers of my fire. Even Ambition, with its hot and shifting flame, is all gone out. The heart, in the dimness of the fading fire-glow, is all itself. The memory of what good things have come over it in the troubled youth-life, bear it up ; and hope and faith bear it on. There is no extravagant pulse-flow ; there is no mad fever of the brain ; but only the soul, forgetting, for once, all save its destinies, and its capacities for good. And it mounts higher and higher on these wings of thought ; and hope burns stronger and stronger out of the ashes of decaying life, until the sharp edge of the grave seems but a foot-scraper at the wicket of Elysium !”

The reveries suggested by the lighting of his cigar,—first with a coal, then with a wisp of paper, and lastly with a match,—are among the best in the book. We would willingly quote much of these,

but have not space for more than the following graphic picture of a boy's love, and the object of it :—

“You half wish that somebody would run away with her, as they did with Amanda in the ‘Children of the Abbey;’ and then you might ride upon a splendid black horse, and draw a pistol or blunderbuss, and shoot the villains, and carry her back, all in tears, fainting and languishing upon your shoulder; and have her father (who is Judge of the County Court) take your hand in both of his, and make some eloquent remarks. A great many such recaptures you run over in your mind, and think how delightful it would be to peril your life, either by flood or fire,—to cut off your arm, or your head, or any such trifle,—for your dear Louise.

“You can hardly think of anything more joyous in life, than to live with her in some old castle, very far away from steamboats and post-offices, and pick wild geraniums for her hair, and read poetry with her, under the shade of very dark ivy vines. And you would have such a charming boudoir in some corner of the old ruin, with a harp in it, and books bound in gilt, with cupids on the cover, and such a fairy couch, with the curtains hung—as you have seen them hung in some illustrated Arabian stories—upon a pair of carved doves!

“And when they laugh at you about it, you turn it off perhaps with saying—‘It is n’t so;’ but afterwards, in your chamber, or under the tree where you have cut her name, you take Heaven to witness that it is so; and think what a cold world it is, to be so careless about such holy emotions! You perfectly hate a certain stout boy in a green jacket, who is for ever twitting you, and calling her names; but when some old maiden aunt teases you in her kind, gentle way, you bear it very proudly; and with a feeling as if you could bear a great deal more for *her* sake. And when the minister reads off marriage announcements in the church, you think how it will sound one of these

days, to have your name and hers read from the pulpit ; and how the people will all look at you, and how prettily she will blush ; and how poor little Dick, who you know loves her, but is afraid to say so, will squirm upon his bench.

“Heigho ! mused I,—as the blue smoke rolled up around my head,—these first kindlings of the love that is in one are very pleasant !—but will they last ?”

We take leave of our bachelor, as with a new but valued acquaintance, offering many good wishes for his welfare and the realization of his dreams. When he does carry them into practice, we trust he will not be persuaded into abandonment of his pen ; for, sure we are, if he proceed as he has begun, his name will before long become as familiar on this side of the Atlantic as it promises to be on the other.

IX.

HIMALAYA AND THE TEA COUNTRIES.

AT the two ends of the Old World—the extreme east and the extreme west—are two nations, powerful, indefatigable, industrious, beyond example, yet who differ in almost every respect, whether in features, habits, dress, manners, or pursuits, resembling each other only in their common devotion to the harmless yet exhilarating infusion of the leaf of a mountain-shrub. Whatever was the beverage of Englishmen in days of yore, *Tea* has now become one of their household necessities, and is held by them in as much esteem as by the original tea-making and tea-drinking subjects of the Celestial Empire. What was at first a luxury, has become an essential element of our daily diet; and assuredly, if the late Emperor of China had succeeded in carrying out his threat of stopping our supplies of tea, we should have sunk into deliberate despair, poisoned ourselves with sloe-leaves and Prussian blue, and wiped ourselves out from the roll of nations. With wise foresight, the Court of Directors

of the East India Company have endeavoured to prevent the possibility of so dire a calamity; and by taking prudent and active measures for the introduction and cultivation of the tea-plant in our Indian dominions, have aimed at rendering Britain in a great measure independent of China. To achieve the desired result, they sent a botanical envoy into Tea-land, one fully qualified for his task—a remark that could not be applied with equal justice to the majority of political ambassadors. In Mr. Fortune they had the good luck to secure the services of a gentleman possessing in an extraordinary degree the knowledge, skill, tact, and daring required. His former wanderings had made him thoroughly conversant with Chinese manners, and he had acquired a sufficient acquaintance with the language of this wonderful country to enable him, when properly attired, to pass muster as a sort of abnormal Chinaman from some province beyond the Great Wall. He thus penetrated far into the interior, and visited districts unknown to Europeans. His plain, graphic, straightforward narrative, simple and truthful throughout, is of the highest interest, and gives a better notion of the highways and bye-ways of China than is conveyed by any description or book of travels hitherto published.* He was successful in the fulfilment of his mission. “Upwards of 20,000 tea-plants, eight

* *A Journey to the Tea Countries of China.* By Robert Fortune. Murray.

first-rate manufacturers, and a large supply of implements were procured from the finest tea-districts of China, and conveyed in safety to the Himalayas." Most gratifying must it be to Dr. Royle, who first recommended the cultivation of tea in the Himalayas, and who has unceasingly insisted upon the importance to our Indian possessions of this branch of culture, to see the prospects becoming fairer every day of an ample fulfilment of all that he has so ably and patriotically advocated.

The chapters of Mr. Fortune's book are partly devoted to the story of his wanderings, and partly to an account of the mode of cultivating the tea-plant and preparing the tea in China. There is also a very interesting notice of the extent and prospects of our Indian tea-plantations. The conditions under which the tea-culture flourishes in China appear to be the following: a moderately rich, moderately moist soil, well drained, either on the slopes of hills, or raised above the watercourses of the plains; a warm summer, a cold winter, and early summer rains; this last point appearing to be essential. The Chinese gather the seeds of the tea-plant in October, and keep them fresh until spring, mixed up with sand and earth. They then sow them thickly, and afterwards transplant in rows the young plants when about a year old, and from nine inches to a foot in height. These plantations are always made in spring, so as to be well watered by the rains that fall at the change of the

monsoon in April and May. They cause little trouble, save in weeding, afterwards, and resemble shrubberies of evergreens. At the end of two or three years, when the plants produce strong and vigorous shoots, the natives pluck the leaves. If they are to be made into *green tea*, they are exposed on flat bamboo trays for a very short time, usually about two or three hours. They are then roasted, and afterwards rolled. At first they are of a dullish green colour, but subsequently become brighter. The tea is afterwards winnowed and sifted, so as to free it from impurities, and separate it into the several kinds or qualities. During this process the coarse kinds are refined once, the finer sorts three or four times. The main points in the making of green tea are the roasting of the leaves immediately after their being gathered, and the drying of them quickly after being rolled. If, on the other hand, the leaves are intended to be made into *black tea*, they are in the first instance spread out on bamboo trays for a considerable time, and then tossed about and patted, until they become soft and flaccid. They are then left in heaps before being roasted, and after that process has been gone through for a few minutes, they are rolled and then exposed for some hours to the air in a soft and moist state; after which they are slowly dried over charcoal fires. Green tea, consequently, is the dried tea leaf with its properties in full strength: black tea, the same leaf partially fer-

mented and oxidized. It was at one time supposed that black and green teas were the products of different species of *Thea*; the black of the *Thea bohea*, the green of the *Thea viridis*, both which plants had been imported into Europe. Mr. Fortune showed in his account in his former narrative that this notion was a mistake, and that both black and green teas are made from the Canton plant, or *Thea bohea*. It was objected, that his conclusion was founded upon observations made only in the tea districts near the coast, and that he had not seen the greater ones inland, which furnish the teas of commerce. During his later travels, of which the volume before us is the account, he visited the desiderated provinces, and has confirmed his previous conclusion. The result is, that both black and green teas are made, at the will of the manufacturer, from the leaves of *Thea viridis* as well as *Thea bohea*. The Chinese are wise enough to drink their green teas unadulterated; but since the barbarians of Europe and America prefer them highly coloured, the Celestials doctor the teas accordingly when intended for foreign markets. It is done systematically. Prussian blue is ground in mortars along with gypsum, four parts of the latter to three of the former substance, and the powder so constituted is scattered over the tea-leaves when roasting. In fourteen and a half pounds of tea, there is rather more than an ounce of colouring matter. In every hundred pounds of coloured green tea there is more

than half a pound of Prussian blue and gypsum ! The Chinese are astonished at our tastes, and we at theirs. They eat roast dog, and we drink poison !

Mr. Fortune has carefully inquired into the cost of production of the different qualities of teas, with the view of ascertaining the probability of our procuring them at a cheaper rate than that which holds at present. It would appear that, all considerations being taken, the expenses of the production are such as to render it questionable whether the Chinese dealers and brokers could not be amply remunerated by a lower price than any yet quoted ; we may therefore hope to obtain the middling and finer qualities at a price much lower than that paid at present. The over-profit lies with the middleman, not with the tea-farmers and tea-makers, who do not seem to get more than is just. Mr. Fortune discourages all hopes of cultivating tea with success in Australia or America, but hints at the possibility of cottagers growing tea-plants for their own use on warm sunny slopes in the south of England and Ireland. He pronounces definitely in favour of India, indicates the causes in certain cases of partial failure, and suggests the remedy. He looks forward to the introduction of cheap tea among the natives of India as one of the greatest boons that could be conferred upon them, and believes that it can and will be produced among the Himalayas so as to be sold at fourpence or sixpence

a pound. Whilst there are eminent men of science, such as Dr. Falconer and Dr. Jameson, directing the botanical establishments in India, and deeply interested in the advancement of the tea-culture there, we may indulge the most sanguine hopes of these anticipations being realized.

Mr. Fortune lost no opportunity of exploring the vegetable productions of China, and especially of seeking for beautiful additions to our gardens. The horticultural shows of London have of late years rejoiced in the display of not a few entirely novel handsome flowers and shrubs, found by our enthusiastic traveller in Chinese gardens during his former visit, and successfully introduced to the notice of British cultivators. Nursery-gardening is a Chinese profession, and plant-nurseries seem to mark the neighbourhood of Chinese even as they do that of the principal of English cities. During this journey he was rewarded by the discovery of several magnificent plants, more especially a funeral cypress of singular elegance. His account of the discovery of this tree is very interesting :—

“But the most beautiful tree found in this district is a species of weeping cypress, which I had never met with in any other part of China, and which was quite new to me. It was during one of my daily rambles that I saw the first specimen. About half a mile distant from where I was, I observed a noble-looking fir-tree, about sixty feet in height, having a stem as straight as the Norfolk Island pine, and weeping branches like the willow of St. Helena. Its branches grew at first at right angles to the main

stem, then described a graceful curve upwards, and bent again at their points. From these main branches others, long and slender, hung down perpendicularly, and gave the whole tree a weeping and graceful form. It reminded me of some of those large and gorgeous chandeliers, sometimes seen in theatres and public halls in Europe.

“What could it be? It evidently belonged to the pine-tribe, and was more handsome and ornamental than them all. I walked, no—to tell the plain truth, I ran up to the place where it grew, much to the surprise of my attendants, who evidently thought I had gone crazy. When I reached the spot where it grew, it appeared more beautiful even than it had done in the distance. Its stem was perfectly straight, like *Cryptomeria*, and its leaves were formed like those of the well-known arbor-vitæ, only much more slender and graceful.

“This specimen was fortunately covered with a quantity of ripe fruit, a portion of which I was most anxious to secure. The tree was growing in some grounds belonging to a country inn, and was the property of the innkeeper. A wall intervened between us and it, which, I confess, I felt very much inclined to get over; but remembering that I was acting Chinaman, and that such a proceeding would have been very indecorous, to say the least of it, I immediately gave up the idea. We now walked into the inn, and, seating ourselves quietly down at one of the tables, ordered some dinner to be brought to us. When we had taken our meal, we lighted our Chinese pipes and sauntered out, accompanied by our polite host, into the garden where the real attraction lay. ‘What a fine tree this of yours is! we have never seen it in the countries near the sea, where we come from; pray give us some of its seeds.’ ‘It is a fine tree,’ said the man, who was evidently much pleased with our admiration of it, and readily complied with our request. These seeds were carefully treasured; and, as they got home safely, and are now growing in England, we may expect in a few years to see a new and striking

feature produced upon our landscape by this lovely tree. Afterwards, as we journeyed westward, it became more common, and was frequently to be seen in clumps on the sides of the hills."

He found also a pretty species of palm, of considerable value on account of the uses, especially as hemp, to which its hairy bracts are applied by the natives, and of much interest, since it is capable of enduring a climate similar to that of the south of England and the milder parts of Europe. We may yet hope to see it rising in our plantations, to which it would be a striking and interesting addition, since we have no indigenous palm to play a part in our landscape. The only palm indigenous in Europe is the little Palmetto, a native of the southernmost bounds of our continent. This Chinese *Chamærops* is consequently a valued prize, and there is great hope of its becoming naturalized. Plants sent to Kew braved, unprotected, the severe winter of the year before last. The Chinese are as fond of flowers and gardens as ourselves, and, as remarked by Mr. Fortune, are more likely to estimate our civilization and attainments highly on this account than on any other. The following picture of a mandarin and his favourite pæony will speak to the heart of many a British horticulturist:—

"In the gardens of the mandarins the tree-pæony frequently attains a great size. There was one plant near Shanghae, which produced between three hundred and

four hundred blooms every year. The proprietor was as careful of it as the tulip fancier is of his bed of tulips. When in bloom, it was carefully shaded from the bright rays of the sun by a canvas awning, and a seat was placed in front, on which the visitor could sit down and enjoy the sight of its gorgeous flowers. On this seat the old gentleman himself used to sit for hours every day, smoking pipe after pipe of tobacco, and drinking cup after cup of tea, while all the time he was gazing on the beauties of his favourite 'Moutan-wha.' It was certainly a noble plant, and well worthy of the old man's admiration."

During Mr. Fortune's journeys into the interior many large and remarkable cities were visited, the notices of which all indicate that the received accounts of the great population, activity, and wealth of the people of China are by no means exaggerated. The author looks forward to the opening out before long of the interior of China to Europeans. When this event shall have taken place, there will indeed be a fine new field for research spread out before us. In the mountainous regions especially are innumerable attractions for the man of science, whilst the scenery is of a remarkably picturesque character. What Mr. Fortune saw of it he has described well, whilst his incidental notices of the people give, so far as they go, a very lifelike impression of their ways and characters. He mixed with them under very different circumstances from those which bring them usually under the notice of Europeans. He evidently does not regard the lower orders of Chinese in a favourable light. Their utter want of

truthfulness is a sad defect in their mental constitution. Yet there is much that is good about the race, and possibly the day may come when these energetic people of the far East may cast aside their prejudices, and join the onward march of science and civilization.

We have often had occasion, when reviewing the narratives of travellers, to indicate and insist upon the necessity of the possession of scientific knowledge by the explorer of distant lands. However amusingly the journal of a voyage be written, unless the information contained in it be solid and, in part at least, scientific, it can boast of no vitality; and, after a brief and ephemeral celebrity, sinks from the shelves of the well-selected library to the limbo of the book-stall, and the pillory of its window-ledge. On the other hand, even when curt and dry, it is sure to retain its attractions, if the learning interwoven with the story of adventure, or appended to it in the shape of supplementary chapters, be original and sound. But, alas! there are few of our travellers who possess science sufficient to enable them to observe with correctness a natural object, or to describe the remarkable phenomena they may chance to have witnessed during their cruising. Nevertheless, the most ignorant scarcely ever hesitate to offer decided opinions on men, manners, races, languages, and all things

animate and inanimate ; settling in a sentence questions that have racked and are still tormenting the brains of the sagest philosophers, and solving problems that both the Humboldts, with Robert Brown, Faraday, and Owen, in council, would pass with a demand for more definite information.

Of late years the order of presumptuous travellers has considerably increased, but fortunately this multiplication has been counteracted by an increase in the number also of well-qualified observers. We have had recently to notice the excellent works of several of the latter class, of whom Dr. Thomson, Professor James Forbes, and Mr. Wallace are examples,—very different in degree, but nevertheless good ones. In the very highest rank of the well-qualified, we can, without fear of contradiction, place the eminent author of the most interesting journals now before us.*

To ramble among the mightiest mountains of the earth, to wind, as it were, in and out among the vertebræ of the old world's backbone, must be a great pleasure and privilege to any traveller. How much more to one who is thoroughly trained and experienced in research, a naturalist in the first degree ! Dr. Joseph Hooker is at the present moment one of the most distinguished of European botanists. At a comparatively early age he has gained, and justly, a reputation that, great as it now is,

* *Himalayan Journals*. By Joseph Dalton Hooker, M.D., R.N., F.R.S. Murray.

grows daily. The author of the 'Flora Antarctica,' one of the most valuable contributions to systematic and geographical botany ever published, has gathered new laurels within the tropics; and has proved himself, if more proof were necessary, as worthy as ever of the distinguished name he inherits from his illustrious father.

The 'Himalayan Journals' contain the account of Dr. Hooker's travels in India and Tibet, from 1848 to 1851. He proceeded to India in the former year on a scientific mission from our Government. Two enlightened noblemen—the Earl of Carlisle, at that time Chief Commissioner of Woods, and the late Earl of Auckland, then First Lord of the Admiralty—were the promoters of the expedition, and obtained the grant of a sum of money from the Treasury to enable our traveller to do his work. The Governor-General of India, Lord Dalhousie, greatly to his credit, appears to have given hearty and generous aid to Dr. Hooker throughout; and in Dr. Falconer, Mr. Hodgson, and Dr. Campbell, all men of distinguished science, and holding important posts in India, he found at once warm friends and powerful supporters. In Dr. Thomson, who joined him at the end of 1849, after the completion of those remarkable journeys, the results of which have conferred a lasting reputation on that adventurous traveller, he met with an old friend and able colleague, first in the east, and latterly in England, where these two enlight-

ened botanists and explorers are now engaged working out, preparatory to a liberal distribution, their joint Indian herbarium, including no fewer than from 6000 to 7000 species of plants. We hope, not without misgivings, that their disinterested labours will meet sooner or later with ample public reward.

The first volume of Dr. Hooker's work is devoted to the account of his journey in 1848 and the spring of 1849, when he travelled from Calcutta to Benares, thence to Dorjiling and among the snowy mountains, through parts of Sikkim and East Nepal. Much of the latter route was over entirely new ground, and that too of the most interesting character, since within it lay the sky-cleaving Kinchinjunga, the loftiest known mountain on the globe.

From a narrative so full of novelty and original information it is not difficult to select passages of interest for the general reader, who indeed will find the entire work as delightful as it is valuable to the man of science. We shall quote somewhat at random, in the order, however, of the author's journey. In the course of his tour through the low country he visited Patna, with the object of seeing the opium stores, and observing the mode of preparation of the drug, of which he gives the following account:—

“The East India Company grant licences for the cultivation of the poppy, and contract for all the produce at

certain rates, varying with the quality. No opium can be grown without this licence, and an advance equal to about two-thirds of the value of the produce is made to the grower. This produce is made over to district collectors, who approximately fix the worth of the contents of each jar, and forward it to Patna, where rewards are given for the best samples, and the worst are condemned without payment; but all is turned to some account in the reduction of the drug to a state fit for market.

“The poppy flowers in the end of January and beginning of February, and the capsules are sliced in February and March with a little instrument like a saw, made of three iron plates with jagged edges tied together. The cultivation is very carefully conducted, nor are there any very apparent means of improving this branch of commerce and revenue. During the north-west, or dry winds, the best opium is procured; the worst, during the moist, or east and north-east, when the drug imbibes moisture, and a watery bad solution of opium collects in cavities of its substance, and is called *Passewa*, according to the absence of which the opium is generally prized.

“At the end of March the opium jars arrive at the stores by water and by land, and continue accumulating for some weeks. Every jar is labelled and stowed in a proper place, separately tested with extreme accuracy, and valued. When the whole quantity has been received, the contents of all the jars are thrown into great vats, occupying a very large building, whence the mass is distributed, to be made up into balls for the markets. This operation is carried on in a long paved room, where every man is ticketed, and many overseers are stationed to see that the work is properly conducted. Each workman sits on a stool, with a double stage and a tray before him. On the top stage is a tin basin, containing opium sufficient for three balls; in the lower another basin, holding water; in the tray stands a brass hemispherical cup, in which the ball is worked. To the man's right hand is another tray, with two com-

partments,—one containing thin pancakes of poppy petals pressed together, the other a cupful of sticky opium-water, made from refuse opium. The man takes the brass cup, and places a pancake at the bottom, smears it with opium-water, and with many plies of the pancakes makes a coat for the opium. Of this he takes about one-third of the mass before him, puts it inside the petals, and agglutinates many other coats over it: the balls are then again weighed, and reduced or increased to a certain weight if necessary. At the day's end, each man takes his work to a rack with numbered compartments, and deposits it in that which answers to his own number, thence the balls (each being put in a clay cup) are carried to an enormous drying-room, where they are exposed in tiers, and constantly examined and turned, to prevent their being attacked by weevils, which are very prevalent during moist winds, little boys creeping along the racks all day long for this purpose. When dry, the balls are packed in two layers of six each in chests, with the stalks, dried leaves, and capsules of the plant, and sent down to Calcutta. A little opium is prepared of very fine quality for the Government hospitals, and some for general sale in India; but the proportion is trifling, and such is made up into square cakes. A good workman will prepare from thirty to fifty balls a day, the total produce being 10,000 to 12,000 a day; during one working season, 1,353,000 balls are manufactured for the Chinese market alone."

At Dorjiling he found himself in full view of the most magnificent alpine landscape in the world, one which every traveller, to whom time and money are at command, should forthwith go and gaze on for himself. Who that loves the grand in scenery does not envy the beholding of the panorama which the resident at Dorjiling daily beholds from the windows of his dwelling! "Kinchinjunga

(forty-five miles distant) is the prominent object, rising 21,000 feet above the level of the observer, out of a sea of intervening wooded hills; whilst on a line with its snows, the eye descends below the horizon to a narrow gulf of 7000 feet deep in the mountains, where the great Rungeet, white with foam, threads a tropical forest with a silver line." Dr. Hooker, at the same time, admits that the Swiss Alps, though not nearly so grand, are yet far more beautiful than the Himalaya. The Alps, from the Jura, are certainly wonderfully grand; but all their magnificence shrinks into diminutiveness when compared with a scene constituted of such elements as the following:—

"The actual extent of the snow range seen from Mr. Hodgson's windows is comprised within an arc of 80° (from north 30° west to north 50° east), or nearly a quarter of the horizon, along which the perpetual snow forms an unbroken girdle or crest of frosted silver; and in winter, when the mountains are covered down to 8000 feet, this white ridge stretches uninterruptedly for more than 160° . No known view is to be compared with this in extent, when the proximity and height of the mountains are considered; for within the 80° above mentioned more than twelve peaks rise above 20,000 feet, and there are none below 15,000 feet, while Kinchin is 28,178, and seven others above 22,000. The nearest perpetual snow is on Nursing, a beautiful sharp conical peak, 19,139 feet high, and thirty-two miles distant; the most remote mountain seen is Donkia, 23,176 feet high, and seventy-three miles distant; whilst Kinchin, which forms the principal mass both for height and bulk, is exactly forty-five miles distant.

"On first viewing this glorious panorama, the impression produced on the imagination by their prodigious ele-

vation is, that the peaks tower in the air and pierce the clouds, and such are the terms generally used in descriptions of similar alpine scenery; but the observer, if he look again, will find that even the most stupendous occupy a very low position on the horizon, the top of Kinchin itself measuring only $4^{\circ} 31'$ above the level of the observer! Donkia again, which is 23,176 feet above the sea, or about 15,700 above Mr. Hodgson's, rises only $1^{\circ} 55'$ above the horizon; an angle which is quite inappreciable to the eye, when unaided by instruments.

"This view may be extended a little by ascending Sinchul, which rises a thousand feet above the elevation of Mr. Hodgson's house, and is a few miles south-east of Dorjiling; from its summit Chumulari (23,929 feet) is seen to the north-east, at eighty-four miles distance, rearing its head as a great rounded mass over the snowy Chola range, out of which it appears to rise, although in reality lying forty miles beyond,—so deceptive is the perspective of snowy mountains. To the north-west again, at upwards of one hundred miles' distance, a beautiful group of snowy mountains rises above the black Singalelah range, its chief being perhaps as high as Kinchinjunga, from which it is fully eighty miles distant to the westward; and between them no mountain of considerable altitude intervenes; the Nepalese Himalaya in that direction sinking remarkably towards the Arun river, which there enters Nepal from Tibet."

During his subsequent travels in East Nepal and Sikkim, in the winter of 1848, Dr. Hooker plunged into the very heart of these mighty mountains, and gives full and most graphic accounts of their scenery and physical features, as well as of their vegetable productions and the races who dwell amid their fastnesses. The notices of the life he led and the people who were about him are

highly interesting. We cite a description of the arrangements of his camp when in East Nepal:—

“Returning to my tent, I was interested in observing how well my followers had accommodated themselves to their narrow circumstances. Their fires gleamed everywhere amongst the trees, and the people, broken up into groups of five, presented an interesting picture of native, savage, and half-civilized life. I wandered amongst them in the darkness, and watched unseen their operations; some were cooking, with their rude bronzed faces lighted up by the ruddy glow, as they peered into the pot, stirring the boiling rice with one hand, while with the other they held back their long tangled hair. Others were bringing water from the spring below, some gathering sprigs of fragrant *Artemisia* and other shrubs to form couches, some lopping branches of larger trees to screen them from nocturnal radiation; their only protection from the dew being such branches stuck in the ground, and slanting over their procumbent forms. The Bhotanese were rude and boisterous in their pursuits, constantly complaining to the Sirdars, and wrangling over their meals. The Ghor-kas were sprightly, combing their raven hair, telling interminably long stories, of which money was the burthen, or singing Hindoo songs through their noses in chorus; and being neater and better dressed, and having a servant to cook their food, they seemed quite the gentlemen of the party. Still the Lepcha was the most attractive, the least restrained, and the most natural in all his actions, the simplest in his wants and appliances, with a bamboo as his water-jug, an earthen pot as his kettle, and all manner of herbs collected during the day’s march to flavour his food.

“My tent was made of a blanket thrown over the limb of a tree; to this others were attached, and the whole was supported on a frame like a house. One half was occupied by my bedstead, beneath which was stowed my box of clothes, while my books and writing materials were placed

under the table. The barometer hung in the most out-of-the-way corner, and my other instruments all around. A small candle was burning in a glass shade, to keep the draught and insects from the light, and I had the comfort of seeing the knife, fork, and spoon laid on a white napkin, as I entered my snug little house, and flung myself on the elastic couch to ruminate on the proceedings of the day, and speculate on those of the morrow, while waiting for my meal, which usually consisted of stewed meat and rice, with biscuits and tea. My thermometers (wet and dry bulb, and minimum) hung under a temporary canopy made of thickly plaited bamboo and leaves close to the tent, and the cooking was performed by my servant under a tree.

“After dinner my occupations were to ticket and put away the plants collected during the day, write up journals, plot maps, and take observations till ten P.M. As soon as I was in bed, one of the Nepal soldiers was accustomed to enter, spread his blanket on the ground, and sleep there as my guard. In the morning the collectors were set to change the plant-papers, while I explored the neighbourhood; and having taken observations and breakfasted, we were ready to start at ten A.M.”

For the man of science the descriptions of the glacial phenomena of the Himalayas will have peculiar value. Their ancient extent, as evidenced by undoubted remains of moraines and terraces of some of these glaciers, was prodigious. It appears to be clearly made out by our traveller that glaciers have, at a former epoch, descended to from 8000 to 10,000 feet in every Sikkim and Nepal valley communicating with mountains above 16,000 feet in elevation, and that in many instances they must have been fully forty miles in length and five hundred feet in depth!

The second volume of Dr. Hooker's excellent work is even more interesting than the first, since the narrative of observation is enlivened by the story of adventure. The endeavours, fortunately successful, of our traveller to reach the frontiers of Tibet and the boundaries of Sikkim were systematically obstructed, and every possible difficulty and discouragement cast in his way. The author of the mischief was the Dewan, or minister, of the aged and infirm Rajah of Sikkim. The latter was a Tibetan, and so was his minister,—a blustering, low-born, energetic trader, parasitic on Sikkim, hated and despised by the better families and priests of the country, who, however, had not the spirit to turn him out, and feared by his imbecile master. The prince himself was poor and powerless, without any revenue to speak of, and with no army to enforce his authority. The Dewan dreaded the British, chiefly because they could undersell him in his mercantile transactions, and contrived to keep us in ignorance of the miserable weakness of the territory, which, poor as it was, he plundered. The Chinese authorities regarded Sikkim as under English sway, and knew its resources and the capacities of its rulers much better than ourselves. Indeed many of our authorities, on the contrary, believed that the Sikkim Rajah was a tributary of China, and consequently a personage not to be lightly interfered with. Whatever importance belonged to the ruler of Sikkim and his people was derived from these mistakes about his power, and the posi-

tion of his country between Nepal and Bootan, serving to limit the ambition of the former state, and the conquering energy of our old acquaintance Jung Behadoor. The determination on the part of Dr. Campbell, our enlightened and able superintendent of Dorjiling, personally to ascertain the real state of affairs, and put the intercourse between the Sikkim government, such as it was and is, on a more satisfactory footing, led to the occurrences graphically narrated by Dr. Hooker, who, along with the superintendent, was made prisoner, and both, especially the latter, barbarously maltreated by the creatures of the Dewan. Fortunately, before this circumstance, Dr. Hooker, first by himself, and afterwards in company with Dr. Campbell, succeeded, by dint of sheer resolution and perseverance, in defeating all the Dewan's attempts at preventing an exploration of the passes into Tibet,—an expedition of the greatest consequence, and in its results of inestimable value to geographical science and natural history. In the end the insult offered to our countrymen was avenged, by the seizure of the Rajah's best lands, and of the whole southern part of Sikkim, to the great benefit and gratification of the inhabitants. The obnoxious Dewan is disgraced, and the friendly Lamas are rewarded. We feel sure that the perusal of Dr. Hooker's narrative will enlighten the minds of some of our politicians, whose notions about Indian frontier states are anything but clear.

Dr. Hooker gives many curious notices of the ways and means of the Tibetan borderers and their priestly chiefs, the Lamas, whose temples, modes of worship, costume, compendious methods of *wheeling* their prayers, and appetite for brick-tea, are well pictured by him. The following little trait of a Lama's educational methods may serve to furnish a new idea for our educational friends at Marlborough House or the Privy Council :—

“The Choongtam Lama was at a small temple near Tungu during the whole of my stay, but he would not come to visit me, pretending to be absorbed in his devotions. Passing one day by the temple, I found him catechizing two young aspirants for holy orders. He is one of the Dukpa sect, wore his mitre, and was seated cross-legged on the grass with his scriptures on his knees : he put questions to the boys, when he who answered best took the other some yards off, put him down on his hands and knees, threw a cloth over his back, and mounted : then kicking, spurring, and cuffing his steed, he was galloped back to the Lama, and kicked off ; when the catechizing recommenced.”

In 1850, on Dr. Hooker's departure from Doringling, a new expedition was projected, and, in company with Dr. Thomson, our traveller proceeded to the Khasia mountains, in eastern Bengal, at the head of the great delta of the Ganges and Burampooter. The narrative of this journey is given at length, and is highly interesting. The country and people described are very different from those of the alpine regions previously explored. The Khasia people are of Indo-Chinese race, peculiar

in many respects, not pleasant to deal with, sulky, intractable, rude and barbarous, pork-eaters and milk-haters. Pigs and fowls are reared by them in abundance, but the eggs of the latter are used only for cracking, as fortune-telling, or, rather, omen-indicating instruments. Their most important ceremonies are funereal, and their principal monuments have reference to the dead. These monuments are highly curious, bearing the closest resemblance to Druidical erections, consisting of gigantic slabs of stone, reared in circles or rows, or placed exactly as they are in cromlechs. The platform of the Khasia mountains is 4000 feet above the sea, and bears a most remarkable flora, in great part of temperate forms and European genera, though at so comparatively low elevation.

A very different country is the great spread of flats that lies below—the Jheels and the Sunderbunds. The Khasia mountains rise abruptly from the Jheels, and seem like a great stone table on the plain. The study of these tropical flats is of much interest to the man of science, and every reader with geological tastes will appreciate the following remarks :—

“To the geologist the Jheels and Sunderbunds are a most instructive region, as whatever may be the mean elevation of their waters, a permanent depression of ten to fifteen feet would submerge an immense tract, which the Ganges, Burrampooter, and Soormah would soon cover with beds of silt and sand. There would be extremely few shells in the beds thus formed, the southern and

northern divisions of which would present two very different floras and faunas, and would in all probability be referred by future geologists to widely different epochs. To the north, beds of peat would be formed by grasses, and in other parts, temperate and tropical forms of plants and animals would be preserved in such equally balanced proportions as to confound the palæontologist; with the bones of the long-snouted alligator, Gangetic porpoise, Indian cow, buffalo, rhinoceros, elephant, tiger, deer, boar, and a host of other animals, he would meet with acorns of several species of oak, pine-cones, and magnolia fruits, rose seeds, and *Cycas* nuts, with palm nuts, screw-pines, and other tropical productions. On the other hand, the Sunderbunds portion, though containing also the bones of the tiger, deer, and buffalo, would have none of the Indian cow, rhinoceros, or elephant: there would be different species of porpoise, alligator, and deer, and none of the above-mentioned plants (*Cycas*, oak, pine, magnolia, and rose), which would be replaced by numerous others, all distinct from those of the Jheels, and many of them indicative of the influence of salt water, whose proximity (from the rarity of sea-shells) might not otherwise be suspected."

From among the many zoological memoranda, of peculiar interest, scattered profusely through Dr. Hooker's pages, we cannot resist quoting the following note of a most curious imitative organic phenomenon:—

"Mr. Theobald (my companion in this and many other rambles) pulled a lizard from a hole in the bank. Its throat was mottled with scales of brown and yellow. Three ticks had fastened on it, each of a size covering three or four scales; the first was yellow, corresponding with the yellow colour of the animal's belly, where it lodged; the second brown, from the lizard's head; but the third, which was clinging to the parti-coloured scales of the neck, had

its body parti-coloured, the hues corresponding with the individual scales which they covered. The adaptation of the two first specimens in colour to the parts to which they adhered is sufficiently remarkable ; but the third case was most extraordinary."

The getting-up of these journals is worthy of their matter. The illustrations, whether maps, plates, or woodcuts, are excellently executed, and selected with great judgment. Not one of them could be dispensed with ; and Mr. Murray has done a real service to the cause of knowledge in thus liberally illustrating a work which must ever remain a standard one in every good library. It is, indeed, one of the very best books we have seen for a long time. Scientific travellers are not always the most agreeable writers, but this work is as attractive in its style as valuable in its matter.

Travellers who visit well-known countries usually, when they write about their wanderings, tell their story in as many words as possible. Those who have explored unknown regions are apt to give their freshly-gathered information in too condensed a form. Dr. Thomson belongs to the latter class.* His journal is a most important contribution to geographical science, containing, as it does, an ample account of the physical features of countries respecting which our knowledge has been scanty

* *Western Himalaya and Tibet*. By Thomas Thomson, M.D., F.L.S. Reeve.

or nothing. It is a thoroughly straightforward and honest description of a series of laborious journeys, in which the results, so far as they are of intrinsic value, are fully stated, whilst the personal exertions and privations of this modest and able traveller are kept out of sight. We should have liked that more had been said about the many little incidents, the delays, impediments, and vexations that necessarily arise during such an expedition ; and yet we cannot but admire the high spirit of the discoverer, who is content to rest his claim to public attention mainly, almost entirely, on the new results developed through his energy and perseverance.

More than once, in noticing works of travels, we have had occasion to censure the ignorance displayed by their authors of the ordinary facts of natural history, and to lament over the opportunities thus lost of filling up gaps in our knowledge of the indigenous productions of little-known countries. This grievous defect cannot, assuredly, be charged in any way against the work now before us. It is brim-full of original natural history observations, made by one fully equal in every respect to the task of pursuing such inquiries. We rise from the perusal of this book with as clear and vivid a conception of the vegetation and soil of Tibet as if we had been companions of the narrator.

Dr. Thomson is an officer in the service of the Hon. East India Company. The son of the illustrious and venerable chemist so lately taken away

from amongst us, he has inherited a love for, and an intimate acquaintance with, science in many forms. His exploration of Tibet was performed as an official duty, one carried out in conjunction with Major Cunningham and Captain Henry Strachey, gentlemen whose names have lately been prominent before the public on account of the great services they have rendered to the development of the geography of Asia. Fortunate, indeed, is the public service that can boast of having men like these in its employment, so enthusiastic, so earnest, so undaunted, and so thoroughly instructed.

The journeys of which this work is the detailed account were made during the years 1847 and 1848. The course taken was up the valley of the Sutlej ; thence, turning off at the junction of the Piti river, following its course, crossing by the Parang Pass into the valley of the river of that name, thence by the Lanak Pass to Hanle in the valley of the Indus. The Tibetan course of the Indus was explored beyond Iskardo, which city and that of Le were visited, and are the subjects of some interesting notes. The country was examined between Iskardo and the famous valley of Kashmir, and between Le and the plains of India. The great valley of Nubra, running parallel with that of the Indus, was minutely examined ; and the journey to the Karakoram Pass, in the Kouenlun mountains, for the first time accomplished by European traveller. This last expedition alone would have secured for Dr. Thom-

son a high place in the roll of geographical investigators.

The old and still popular notion of Tibet is that of a great mountain table-land, or series of table-lands, at the back of the Himalaya, by which mighty chain its southern boundary is made, a barrier broken through by the Indus at one extremity, and the Brahmaputra at the other, whilst its northern limit is similarly walled in by the Kouenlun chain. The country thus supposed to exist is entirely imaginary. There is no such great table-land. Nor is there, indeed, any such great continuous chain as the Himalaya itself. The line of snowy peaks running parallel to the plains of India are not so many summits of one alpine chain, but are separated from each other by deep ravines, through which flow large and rapid rivers. Between the Indus and the plains of North-west India is a rugged and mountainous tract 150 miles broad. Kashmir is the only plain of any extent among these mountain ranges. The mountains between the Indus and the plains may be referred to two great groups, which may be respectively termed the Cis-Sutlej and Trans-Sutlej Himalayas. Tibet is the region among and of these mountains between their outer ramifications and the great chain of Kouenlun beyond the Indus. This chain separates Tibet from Yarkand and Khoten. Over this stupendous barrier there are said to be only four passes, all crossing regions of eternal snows, and two traversing enor-

mous glaciers. The Karakoram Pass is one of these, and is 18,200 feet above the level of the sea. The visit to this extraordinary locality is thus described by Dr. Thomson :—

“On the 19th of August, leaving my tent standing, I started to visit the Karakoram Pass, the limit of my journey to the northward. The country round my halting-place was open, except to the north, where a stream descended through a narrow valley from a range of hills, the highest part of which was apparently about 3000 feet above me. All the rivers had formed for themselves depressions in the platform of gravel which was spread over the plain. At first I kept on the south bank of the river close to which I had halted, but about a mile from camp I crossed a large tributary which descended from the south-west, and soon after, turning round the rocky termination of a low range of hills, entered a narrow valley which came from a little west of north-west. At the foot of the rocky point of the range were three very small huts, built against the rock as a place of shelter for travellers in case of stormy or snowy weather ; and bones of horses were here scattered about the plain in greater profusion than usual.

“I ascended this valley for about six miles : its width varied from two hundred yards to about half a mile, gradually widening as I ascended. The slope was throughout gentle. An accumulation of alluvium frequently formed broad and gently-sloping banks, which were cut into cliffs by the river. Now and then large tracts covered with glacial boulders were passed over ; and several small streams were crossed, descending from the northern mountains through narrow ravines. About eight miles from my starting-point the road left the bank of the stream, and began to ascend obliquely and gradually on the sides of the hills. The course of the valley beyond where I left it continued unaltered, sloping gently up to a large snow-

bed, which covered the side of a long, sloping ridge four or five miles off. After a mile, I turned suddenly to the right, and, ascending very steeply over fragments of rock for four or five hundred yards, I found myself on the top of the Karakoram Pass—a rounded ridge connecting two hills which rose somewhat abruptly to the height of perhaps 1000 feet above me. The height of the pass was 18,200 feet, the boiling-point of water being 180.8° , and the temperature of the air about 50° . Towards the north, much to my disappointment, there was no distant view. On that side the descent was steep for about five hundred yards, beyond which distance a small streamlet occupied the middle of a very gently sloping valley, which curved gradually to the left, and disappeared behind a stony ridge at the distance of half a mile. The hills opposite to me were very abrupt, and rose a little higher than the pass; they were quite without snow, nor was there any on the pass itself, though large patches lay on the shoulder of the hill to the right. To the south, on the opposite side of the valley which I had ascended, the mountains, which were sufficiently high to exclude entirely all view of the lofty snowy mountain seen the day before, were round-topped and covered with snow. Vegetation was entirely wanting on the top of the pass; but the loose shingle with which it was covered was unfavourable to the growth of plants, otherwise, no doubt, lichens at least would have been seen. Large ravens were circling about overhead, apparently quite unaffected by the rarity of the atmosphere, as they seemed to fly with just as much ease as at the level of the sea.

“The great extent of the modern alluvial deposit concealed in a great measure the ancient rocks. At my encampment a ridge of very hard limestone, dipping at a high angle, skirted the stream. Further up the valley a hard slate occurred, and in another place a dark blue slate, containing much iron pyrites, and crumbling rapidly when exposed to the atmosphere. Fragments of this rock were

scattered over the plain in all states of decay. On the crest of the pass the rock *in situ* was limestone, showing obscure traces of fossils, but too indistinct to be determined; the shingle, which was scattered over the ridge, was chiefly a brittle, black, clay slate."

Conceive a vast tract of country, the lowest valley of which is as high as the summit of the Faulhorn in Switzerland, and many of whose habitable spots are nearly as lofty as the summit of Mont Blanc, composed of prodigious mountain chains from 17,000 to 19,000 feet above the sea, with occasional peaks exceeding 22,000 feet, winding and interlacing, intersected by deep and narrow valleys—ravines on an enormous scale—with too arid a climate to support forests, or any coniferous tree except alpine junipers—covered by a sky cloudy in winter, clear and bright in summer, and a powerful sun heating the bare black rocks, whilst the air is rent by winds of fearful violence—and we can form a picture of Western Tibet, the region explored by Dr. Thomson.

There are many features in this extraordinary country which can only be explained by the supposition of a considerable difference in its physical conditions at an epoch immediately preceding and connected with the geological present. Among these are the evidences of prodigious lakes filling up great valleys, now dry, and leaving their traces in deposits at uniform heights along the mountain sides. Also, great glacial extensions manifested by moraines, till, and boulders :—

“In every part of the Tibetan mountains,” observes Dr. Thomson, “and in very many parts of the Indian Himalaya, I have thought that I could recognize unmistakable proofs of all the valleys having been formerly occupied by glaciers at much lower levels than at present. At first sight it seems rather improbable, that in sub-tropical latitudes the present extension of perpetual snow should at any former period have been exceeded; but it would not be difficult to show that the mean temperature, and particularly the mean summer temperature, is very much higher in the Western Himalaya and Tibet than it might fairly be expected to be in such a latitude. In fact, in the more humid climate of Eastern Bengal, though at least four degrees nearer to the equator, the mean summer temperature at equal elevations in the mountains is probably considerably lower than in the mountains of North-west India, and the snow-level is certainly lower. It is fair therefore to conclude, looking back to a period when the sea washed the base of the Himalaya in the upper part of the Punjab, that at that period a very different state of atmospheric circumstances prevailed from that which we find at the present time.

“Wherever I have seen glaciers in Tibet, or the mountains of India, I have been able to trace their moraines to a level very considerably lower than their present termination; and when I find in those ranges of the Himalaya which do not at present attain a sufficient elevation to be covered with perpetual snow, series of angular blocks, evidently transported, because different from the rocks which occur *in situ*, and, so far as I can judge, exactly analogous in position to the moraines of present glaciers, I feel myself warranted in concluding that they are of glacial origin, and find it necessary to look about for causes which should render it probable that the snow-level should have formerly been lower than it is at present. In the rainy districts of the Himalaya, where forest covers the slopes of the hills, it is difficult to fix the lowest limits at which

evident moraines occur ; but in many places I have seen them at least three thousand feet lower than the terminations of the present glaciers. In the valley of the Indus, accumulations of boulders, which I believe to be moraines, occur in Rondu as low as 6000 feet."

The chief city of Western Tibet is Le, the capital of Ladak. It is situated 11,800 feet above the level of the sea ! Poplar and willow trees grow about it. It contains 3000 inhabitants. In its neighbourhood are perfect examples of some of the more remarkable erections connected with the peculiarities of Tibetan religious belief.

Among the discoveries of our traveller is that of the locality whence the borax imported from Tibet is procured. The plain of Pugha is the result of the drying-up or drainage of an ancient lake. It is covered to the depth of several feet with white salt, principally borax. By digging below the superficial layer, the borax is obtained in a tolerably pure state.

Near Khapalu, Dr. Thomson found the people occupied washing the sands of the Indus for gold. This is their winter labour, when there is nothing else to be done ; for gold-seeking is not a profitable business there. For one rupee the traveller bought the whole produce of one man's labour during three weeks. Our diggers are not likely to emigrate to Tibet.

Dr. Thomson's volume is illustrated by some highly picturesque views of Iskardo, from sketches

by Mr. Winterbottom, an accomplished traveller and good naturalist, who has not yet done his duty to the public by communicating the results of his adventurous researches. Also, by an admirably engraved original map of the mountains of Northern India, drawn by Mr. Arrowsmith, whose love for his favourite science may be traced in the painstaking accuracy and truthful expression manifested in all his delineations of newly-explored countries.

X.

THE SALT LAKE AND THE MORMONITES.

THERE is a remarkable passage in Southey's 'Colloquies,' in which the rise in America of a great religious sect, comparable with the Mahometan, is predicted as an event that may sooner or later materially influence the fortunes and destinies of the New World. The far-seeing and earnest man who recorded this singular and seemingly, at the time, absurd conviction, could scarcely have anticipated so rapid a fulfilment of his prophecy as is likely to occur. Twenty years ago an illiterate impostor, whose talents consisted in a mixture of low but profound cunning, with determined energy and undoubting self-confidence—qualities which, when combined with the inheritance of a great name, can make an Emperor of France in the year 1852—devised a new religion, and found ready dupes and active disciples. Out of the stolen sheets of an unpublished romance, and his own blundering and barbarous imitations of the inspired writings of the Holy Evangelists, he constructed a new

Gospel,—a clumsy imposition enough; but, with all its absurdity, it is already the sacred book of hundreds of thousands of believers. Such is the force of fanaticism! It would seem to matter little whether the founder of a false religion be a heaven-born genius or an earth-spawned knave. The difference between Mahomet and Joe Smith, whose plebeian appellation promises to become as famous, and held in as much reverence by crouching multitudes as the once powerful name of the illustrious founder of the Moslem faith, was much about equal to the difference between Napoleon the Great and Napoleon the Little.

The age is lost in wonder at the migrating stream of gold-seekers pouring in upon the El Dorados of California and Australia. A far more astonishing phenomenon is the emigration of thousands to the new holy land of Utah, seeking for a terrestrial paradise amid the wilds of Deseret, and a New Jerusalem in the city of the Great Salt Lake. Ships sail from Liverpool laden with “Latter-Day Saints,” firm believers in the divine mission of Joe Smith, the literal inspiration of the Book of Mormon, the “hopeless corruption” of the Holy Bible, and the prophetic authority of Governor Brigham Young. Comfortable farmers, even small and unembarrassed proprietors, quit the homes of their ancestors and the scenes of their childhood, renounce an allegiance to the Government under which they have safely and happily lived, and com-

munion with the church of their fathers, to brave perils by sea and land for the sake of one of the grossest impostures and most transparent shams that ever deluded human credulity. Wonderful indeed must be the spell that can annihilate in the hearts of good homely men and women, not only all the elements of the Christian faith, about which they had never been taught to doubt, but even the ties, almost as sacred, by which their family life had hitherto been regulated. The converts to Mormonism—to a barbarous and bigoted false religion, to utter uncharitableness, and to polygamy—are not to be found among scoffers and sceptics, reprobates and godless vagabonds, but among pious and well-conducted families, people against whom there is no slur, and frequenters of prayer-meetings. There must be something grievously wrong in the intellectual condition of the community amidst whom this strange form of fanaticism can take root. There needs no long search to discover the source of the evil. In the want of enlightened education we can too plainly discern the cause.

Men in earnest, even when wrongly in earnest, are never to be despised; and in the energy, perseverance, success, and stern consistency of the Mormons, there is much that, in spite of their absurdities, demands impartial inquiry and commands unprejudiced admiration. With great pleasure have we perused the fair and truly impartial account of their settlements and customs contained in the

official narrative of the expedition to the valley of the Great Salt Lake of Utah.* It does the reporter, Captain Stansbury, much honour, and reflects great credit on the authorities in the United States, who selected so judicious and able an officer for the delicate and difficult, not to say dangerous, task of exploring scientifically the Mormonite territories. We can conscientiously say, that we have never read any narrative of an exploring expedition that impressed us with a stronger feeling of confidence in every statement, and of belief in the soundness of judgment with which all the operations were conducted, than this by Captain Stansbury. We would strongly recommend our readers who may wish to have a correct notion of the singular religious sect that have peopled the State of Deseret, to procure this book. Of the strangest of all the Mormonite practices, and that which has excited most astonishment, the following is Captain Stansbury's account :—

“But it is in their private and domestic relations that this singular people exhibit the widest departure from the habits and practice of all others denominating themselves Christians. I refer to what has been generally termed the ‘spiritual wife system,’ the practice of which was charged against them in Illinois, and served greatly to prejudice the public mind in that State. It was then, I believe, most strenuously denied by them that any such practice prevailed, nor is it now openly avowed, either as a

* *An Expedition to the Valley of the Great Salt Lake of Utah.* By Howard Stansbury. Low.

matter sanctioned by their doctrine or discipline. But that polygamy does actually exist among them cannot be concealed from any one of the most ordinary observation, who has spent even a short time in this community. I heard it proclaimed from the stand, by the president of the church himself, that he had the right to take a thousand wives, if he thought proper; and he defied any one to prove from the Bible that he had not. At the same time, I have never known any member of the community to avow that he himself had more than one, although that such was the fact was as well known and understood as any fact could be.

“If a man, once married, desires to take him a second helpmate, he must first, as with us, obtain the consent of the lady intended, and that of her parents or guardians, and afterwards the approval of the seer or president, without which the matter cannot proceed. The woman is then ‘*sealed*’ to him under the solemn sanction of the church, and stands, in all respects, in the same relation to the man as the wife that was first married. The union thus formed is considered a perfectly virtuous and honourable one, and the lady maintains, without blemish, the same position in society to which she would be entitled were she the sole wife of her husband. Indeed the connection, being under the sanction of the only true priesthood, is deemed infinitely more sacred and binding than any marriage among the gentile world, not only on account of its higher and more sacred authority, but inasmuch as it bears directly upon the future state of existence of both the man and the woman; for it is the doctrine of the church, that no woman can attain to celestial glory *without the husband*; nor can he arrive at full perfection in the next world without at least one wife; and the greater the number he is able to take with him, the higher will be his seat in the celestial paradise.

“All idea of sensuality, as the motive of such unions, is most indignantly repudiated; the avowed object being

to raise up, as rapidly as possible, 'a holy generation to the Lord,' who shall build up his kingdom on the earth. Purity of life, in all the domestic relations, is strenuously inculcated; and they do not hesitate to declare, that when they shall obtain the uncontrolled power of making their own civil laws (which will be when they are admitted as one of the States of the Union), they will punish the departure from chastity in the severest manner, even by death.

"As the seer or president alone possesses the power to approve of these unions, so also he alone can absolve the parties from their bonds, should circumstances in his judgment render it at any time either expedient or necessary. It may easily be perceived then what a tremendous influence the possession of such a power must give to him who holds it, and how great must be the prudence, firmness, sagacity, and wisdom required in one who thus stands in the relation of confidential adviser, as well as of civil and ecclesiastical ruler, over this singularly constituted community.

"Upon the practical working of this system of plurality of wives, I can hardly be expected to express more than a mere opinion. Being myself an 'outsider' and a 'gentile,' it is not to be supposed that I should have been permitted to view more than the surface of what is, in fact, as yet but an experiment, the details of which are sedulously veiled from public view. So far however as my intercourse with the inhabitants afforded me an opportunity of judging, its practical operation was quite different from what I had anticipated. Peace, harmony, and cheerfulness seemed to prevail, where my preconceived notions led me to look for nothing but the exhibition of petty jealousies, envy, bickerings, and strife. Confidence and sisterly affection among the different members of the family seemed preeminently conspicuous, and friendly intercourse among neighbours, with balls, parties, and merry-makings at each other's houses, formed a prominent and agreeable feature

of the society. In these friendly reunions, the president, with his numerous family, mingled freely, and was ever an honoured and welcomed guest, tempering by his presence the exuberant hilarity of the young, and not unfrequently closing with devotional exercises the gaiety of a happy evening."

The remarkable man who acts as governor of this extraordinary community is Brigham Young. He is at once their confidential adviser, temporal ruler, and prophet of God. He led them to the land in which they are now settled, and exhibited undaunted resolution, firmness and sagacity, energy and enthusiasm. He is described as personally without reproach, a man of unquestionable integrity and discretion. He appears to be thoroughly in earnest; and, did we not see every day at home how many able men maintain earnestly outrageous and unreasonable crotchets in defiance of truth and progress, we should express our astonishment how Brigham Young could possibly be a Mormon.

The main purpose of Captain Stansbury's book is to describe the physical features of the country which he explored. It is a journal of the everyday operations of the survey which he conducted, and of the routes taken to reach and to leave the territory of the Great Salt Lake. It is a most important contribution to Geography, and abounds, moreover, in information of high natural history interest. To some of the scientific results, especially such as might escape the ordinary reader, we wish to call attention.

An interesting geological fact is the finding of drift clay, with marine shells and bones of mammalia, on the forks of Platte River. This has a direct bearing on the recent speculations of Mr. Hopkins, and on the interesting problem of the course of the gulf-stream during the Pleistocene epoch. Around the Great Salt Lake the country is composed in great part of highly inclined and distinctly stratified metamorphic rocks, whilst the more elevated portions of the shore of the lake, and the mountain ranges around it, are formed of carboniferous limestone. The summit of Stansbury's Island, 3000 feet above the sea, is of this limestone, resting on coarse sandstone and conglomerate. In the neighbourhood of the Great Salt Lake city the limestone is quarried, and is similarly superimposed. The system to which it belongs appears to occupy the position of low synclinal bases, the valleys between which (as remarked by Professor James Hall) have probably originated, to a large extent, through erosion along the anticlinal axes, produced by the elevation of the metamorphic rocks. It is probable that beds of coal, like those on the north fork of Platte River, will be found above, and in connection with, this limestone in many places, and become of great consequence to the promotion of the prosperity of this region. The height of the valley of the Salt Lake is about 4300 feet above the level of the sea. The aspect of the lake itself is thus vividly described :

“ The evening was mild and bland, and the scene around us one of exciting interest. At our feet and on each side lay the waters of the Great Salt Lake, which we had so long and so ardently desired to see. They were clear and calm, and stretched far to the south and west. Directly before us, and distant only a few miles, an island rose from eight hundred to one thousand feet in height, while in the distance other and larger ones shot up from the bosom of the waters, their summits appearing to reach the clouds. On the west appeared several dark spots, resembling other islands, but the dreamy haze hovering over this still and solitary sea threw its dim, uncertain veil over the more distant features of the landscape, preventing the eye from discerning any one object with distinctness, while it half revealed the whole, leaving ample scope for the imagination of the beholder. The stillness of the grave seemed to pervade both air and water ; and, excepting here and there a solitary wild-duck floating motionless on the bosom of the lake, not a living thing was to be seen. The night proved perfectly serene, and a young moon shed its tremulous light upon a sea of profound, unbroken silence. I was surprised to find, although so near a body of the saltiest water, none of that feeling of invigorating freshness which is always experienced when in the vicinity of the ocean. The bleak and naked shores, without a single tree to relieve the eye, presented a scene so different from what I had pictured in my imagination of the beauties of this far-famed spot, that my disappointment was extreme.”

The water of the Salt Lake analysed by Dr. Gale, is stated to be one of the purest and most concentrated brines known in the world, containing full twenty per cent. of pure chloride of sodium, and not more than two per cent. of other salts. Since however it must vary considerably in its

strength at different seasons of the year, this estimate only expresses its constitution at the time specimens were taken by the explorers. The water is remarkably buoyant. "A man may float stretched at full length, upon his back, having his head and neck, both his legs to his knee, and both arms to his elbow, entirely out of the water." It is very difficult to swim in, since the the lower extremities of the swimmer have a constant tendency to rise above the surface. However expert, moreover, a swimmer might be, if he accidentally swallowed a mouthful of the brine, he could scarcely escape suffocation. On one occasion a man of Captain Stansbury's party fell overboard, and in consequence of gulping some of the obnoxious element, was nearly drowned, although a good swimmer. But though so dangerous when taken internally, the lake water supplies a delightful and invigorating bath. The difficulty of finding fresh water around its shores, the necessity of carrying with them all their provisions, the barren and savage character of a great part of the region traversed, rendered the survey unusually arduous and protracted, and would have proved fatal to its progress had not the climate been one of exceeding salubrity, so that, with all their trials and fatigues, the members of the exploring party enjoyed uninterrupted good health.

The ancient extent of the lake must have been far greater than its present limits indicate. As

many as thirteen distinct marks of ancient levels, successive terraces formed by ancient beaches,—the highest as much as two hundred feet above the plain,—were counted one in place. These appearances, comparable with the famous ‘parallel roads’ of Glenroy, in Scotland, would lead to the inference that the Great Salt Lake was formerly vastly more extensive, stretching for hundreds of miles, studded with huge islands, now forming the isolated mountains that rise amid the surrounding plains. The immense miry flats, consisting of soft mud, traversed by rills of salt and sulphurous water, that bound its western shores, would themselves, if submerged for a few feet, convert the lake into a far-extending inland sea. At present they glisten with salt-crystals, whose brilliant glare is interrupted occasionally by oases of artemisia and greasewood. The two valleys that lie at the southern end of the lake are the only parts of its shores adapted for human habitation.

It is much to be desired that the zoological features of the lake were systematically explored. Every here and there in the narrative the presence of countless fish-eating birds is mentioned, but whether any portion of their food be derived from the animal inhabitants (if any) of the waters of the lake itself is not distinctly stated. We are the more anxious that an inquiry into its animal contents should be instituted, even though its results would probably be negative, since it is only

by observations of this kind that we can hope to get at a clear idea of the organic conditions that prevailed in the waters in which the great saliferous formations of pre-adamite epochs were deposited. There is a curious notice of the insectivorous habits of some of the aquatic birds that frequent the waters of the lake. Numbers of small black flies are blown into the waves by the wind, and gathered into the lines of currents. "In the midst of these were flocks of 'gulls' floating upon the water, and industriously engaged in picking them up, precisely as a chicken would pick up grains of corn, and with the same rapidity of motion." The pelicans that build on Gunnison's Island are said to get their fish-prey from "Bear River, the Weber, the Jordan, or the warm springs on the eastern side of Spring Valley," whence the parent birds must carry the food for their young ones more than thirty miles. This statement would seem to imply that there are no fish in the lake itself. A curious feature in its zoology is the immense accumulation on its shores of the larva-cases and other exuviae of dipterous insects, probably preserved in such quantities through the peculiar qualities of the water. No mention is made of molluscos animals or their shells. The mammals collected from the neighbourhood are stated to belong to the Rocky Mountain series. The most interesting is the great-tailed fox, *Vulpes macrourus*, described for

the first time in this work. Several interesting new plants were gathered.

In the course of the journal are not a few notices of the aborigines of the country traversed. The expedition was conducted during the years 1849 and 1850. On the outward journey the Indian tribes encountered were suffering dreadfully from the cholera. On one occasion a number of Indian lodges was observed pitched on the opposite side of a river, but with no signs of animation around. Prompted by curiosity, excited by so unusual a sight, the members of the expedition forded the stream, when the following melancholy scene presented itself:—

“I put on my mocasins, and displaying my wet shirt like a flag to the wind, we proceeded to the lodges which had attracted our curiosity. There were five of them, pitched upon the open prairie, and in them we found the bodies of nine Sioux, laid out upon the ground, wrapped in their robes of buffalo-skin, with their saddles, spears, camp-kettles, and all their accoutrements, piled up around them. Some lodges contained three, others only one body, all of which were more or less in a state of decomposition. A short distance apart from these was one lodge, which, though small, seemed of rather superior pretensions, and was evidently pitched with great care. It contained the body of a young Indian girl of sixteen or eighteen years, with a countenance presenting quite an agreeable expression; she was richly dressed in leggings of fine scarlet cloth, elaborately ornamented; a new pair of mocasins, beautifully embroidered with porcupine quills, was on her feet, and her body was wrapped in two superb buffalo-robes, worked in like manner. She had evidently been dead but a day

or two; and to our surprise a portion of the upper part of her person was bare, exposing the face and part of the breast, as if the robes in which she was wrapped had by some means been disarranged, whereas all the other bodies were closely covered up. It was, at the time, the opinion of our mountaineers that these Indians must have fallen in an encounter with a party of Crows; but I subsequently learned that they had all died of the cholera, and that this young girl, being considered past recovery, had been arrayed by her friends in the habiliments of the dead, enclosed in the lodge alive, and abandoned to her fate—so fearfully alarmed were the Indians by this, to them, novel and terrible disease. But the melancholy tale of this poor forsaken girl does not end here. Her abandonment by her people, though with inevitable death before her eyes, may perhaps be excused from the extremity of their terror; but what will be thought of the conduct of men enlightened by Christianity, and under no such excess of fear, who, by their own confession, approached and looked into this lodge while the forsaken being was yet alive, and able partly to raise herself up and look at them, but who, with a heartlessness that disgraces human nature, turned away, and without an effort for her relief, left her alone to die! Which company deserved the epithet of savages, the terrified and flying red-men, or the strong-hearted whites who thus consummated their cruel deed?"

The volume (it is a portly one) is abundantly illustrated by very characteristic and well-drawn sketches of scenery, evidently faithful delineations, and not modified for the sake of artistic effect. There is an accompanying atlas, exhibiting the route and country explored on a large scale, too large indeed for the convenience of the readers, who would have been greatly benefited

by the introduction, associated with the narrative, of an index map. Extensive scientific appendices, the illustrations of which, especially the figures of reptiles and plants, are very spirited and well executed, conclude the work,—one in every respect calculated to do credit to its author, his companions, and the Government by whom they were commissioned.

XI.

THE NATURALIST ABROAD AND AT HOME.

WERE the famous wishing-carpet of the 'Arabian Nights' either purchasable or let out for hire, we could not resist the temptation of taking a fly to the West Indies, and alighting among the mountains of Jamaica. We would go there when the yellow fever was out of season, and, by a careful study of Colonel Reid's laws of storms, select the interval between two hurricanes for our visit. How delightful to rise out of the semi-solid atmosphere of London, and find oneself suddenly under the cloudless heavens of the tropics! Doubtless the sun is very hot, but then we would choose the cool evening for our flight, and so avoid inconveniences. Seated under a palm-tree, with an arborescent fern in the foreground, and a grove of cocoa-nuts in the distance, we would pass a few hours of intense exotic enjoyment. All manner of curious creatures would congregate around us—strange birds with bright feathers; agile lizards, changing colour every moment; beetles with prodigious horns, and

wasps with awful stings ; snails with no ends to their shells ; and, at a safe distance, boa constrictors of terrific dimensions. And yet how confused and uninformative our pleasure would be, amid all these wonders, if we were ignorant of natural history ! Unable to observe correctly, incapable of judging of the meaning of the curious organisms about us, we should soon begin to lament our neglect of the most fascinating of sciences, and find ourselves in the condition of ninety-nine out of a hundred travellers through foreign parts.

The charms of a residence in a foreign land are increased tenfold if the traveller be a zoologist or a botanist. However dull a country may seem, however uninteresting its human population, the creatures that live on its surface, or swarm amid the waves that wash its shores, afford a constant and inexhaustible source of amusement and instruction. The naturalist is at home everywhere, and finds a museum where the ordinary voyager sees nothing but a waste. In the polar regions he is intensely happy, but in the tropics he is in Paradise itself. No district is so poor and barren but that it has treasures for him, and none so rich but that all its gold would fail to prevent his rushing after a new butterfly, or climbing the rocks after a new flower. It is a curious fact that several able botanists explored and resided in the gold regions of California, aware of the indications of the pre-

cious metal, before the rush to the diggings, but were too absorbed in the delights of their own peculiar pursuits to think of grubbing for lucre.

Our West Indian colonies are rich fields for natural-history investigations, yet are rarely systematically explored. The beautiful island of Jamaica is especially inviting ; and though it has been visited by several competent observers, besides having had among its residents some few of considerable scientific acquirements, still offers a rich field for fresh observation.* But what country does not ? Mr. Gosse rightly remarks, in his preface, that of the hundred thousand animals reputed to be 'known to naturalists,' ninety thousand are probably recorded only as preserved specimens, carefully measured and scientifically named, but of whose habits and mode of life we do not possess a record. A few such volumes as this on Jamaica, in which the writer treads in the path of our own Gilbert White, would furnish us with more real natural-history science than a hundred dry Faunas and Floras, valuable as such documents unquestionably are.

Mr. Gosse is well and favourably known for his zoological acquirements ; and, besides books of lesser mark, is the author of a charming volume descriptive of the periodical natural-history phenomena of Canada, of a valuable account of the birds

* *A Naturalist's Sojourn in Jamaica.* By Philip Henry Gosse. Longman and Co.

of Jamaica, and of a popular British Ornithology. The work now before us consists of a series of interesting notes and descriptions of animal and vegetable life, with occasional vivid pictures of scenery. It is by far the best delineation of the aspect of animated nature in the tropical islands of the western hemisphere that we have yet seen; and this is no mean praise, since several excellent volumes have been devoted to this region. It is written in a remarkably pleasing style, and is as attractive to the ordinary as to the scientific reader.

No sooner did Mr. Gosse land in Jamaica than he commenced his search after living things in right earnest, and from the moment of putting foot on shore seems to have persecuted unceasingly every sort of creeping thing that came in his way. Animal and vegetable had equal attractions for him, and *Cincindela* had no more chance of escape than *Convolvulus*. Let us see how he fared among those exquisite productions of tropical seas, the corals:—

“Observing that what appeared to be rocks under water were really growing corals, I stripped and got in among them. They are of many kinds and of various colours; being covered with the round disks of the soft gelatinous animals aggregated so closely as to touch each other, giving a very slimy unpleasant feeling to the foot that treads on them, though with a shoe on; for I dared not trust myself with naked feet among the *Echini* and other formidable creatures, not to mention the sharp points of

the honeycombed rocks. It was at the ebb of a spring-tide, the moon setting as I began my examination; yet I found little variation in the height of the water, tide here being very small. Some of the corals (*Millepora complanata*?) grow in thin irregular perpendicular plates, joining each other at various angles, so as to form large honeycomb work, somewhat resembling the second stomach of an ox; others present thick flattened branches, covered with minute projecting mouths: these are of a bright fawn-colour, while alive; other close-pored masses, of a rounded form, are bright grass-green; and huge round brainstones (*Meandrina*), which are very numerous, are of a dull olive-brown hue. The first two kinds were easily broken, so that I detached large fragments without difficulty; but though touching them for this purpose did not sensibly affect the hand, the more tender skin of the thighs and legs was susceptible of a stinging influence from the slightest contact; and my leg, which was rudely scratched against one, presently swelled up into a large tumour, very painful. The water in some parts was up to my neck, and the rolling surge made it difficult to preserve my footing. All were slimy to the touch; but a very branched and flexible kind, growing in a tuft of numerous stems, springing from a common basal point, and waving gracefully in the roll of the sea, was particularly slimy, and communicated to the hands more of the remarkably strong nauseous smell which all living corals possess. Three or four living sea-fans I took, and also some soft bunches of a plentiful coralline.

“After this I waded out to the reef which runs along parallel to the shore, at about a hundred yards’ distance from it. The water here was knee-deep. Many small corals were on the bottom, apparently alive, of different species, some of which were very pretty. On almost every specimen that we lifted there were marine animals, parasitically lodged in the interstices. Among them were two or three of a little *Sepia*, that adhered with exceeding tenacity to

the coral, and contracted its arms so as to lie in the hollows, resisting all attempts at dislodgement; till suddenly, on a moment's respite, the creature would rear up its leoprous form, like Satan before Ithuriel, and try to scud away. A species of *Aphrodite* was numerous, which, on being handled, thrust out bundles of white silky bristles *that adhered to the fingers*; their points had been visible before, just projecting from the sides. Star-fishes (*Ophiuræ*), of two or three species, entwined their snake-like tails in crevices, and were difficult to get out; and when out, usually broke into fragments. One specimen dismembered itself the moment it left the water, before it had been touched."

Much valuable information, most fully and fairly acknowledged, has been contributed to the work by a resident gentleman of Jamaica, Mr. Richard Hill, who appears to be an acute and experienced observer. Mr. Gosse is an able artist as well as naturalist, and has embellished his book with several well-chosen views of Jamaica scenery, and some spirited coloured drawings of remarkable animals, especially of reptiles and fishes. They increase the attractions of a volume which is sure to add to its author's fame, and to find a permanent place on the shelves of every good library.

In the writings of the hangers-on of the biological sciences there is often no small amount of cant about "field-naturalists." This term is usually applied to men who, despising systematic science and monographic labour, make short ex-

cursions among wild flowers and singing birds, and on their return home write rhapsodies about their brief experiences. Their pens are, in most instances, endowed with a quality exactly analogous with that popularly termed 'gab,' when tongues are spoken of. They hold hard-working anatomists and minutely-laborious investigators of species in equal and undisguised dislike. They delight in the English names of cockchafers and cock-sparrows, and scarcely conceal their contempt for Linnæus and the nomenclature he invented. They believe that no man who is tied to a museum, or whose duties necessarily limit his studies within the confines of London, can understand the beauties of the animal and vegetable worlds. They never read books, if they can help it, though very anxious that others should read their own. They are scattered over all parts of Britain, here and there, and some few are nestled even in the great metropolis itself. They have no faith in collections, and doubt the utility of zoological and botanical gardens, unless the animals in the former could be allowed to run wild, and the plants in the latter permitted to intermingle and intertwine in unsystematic confusion.

These so-called 'field-naturalists' seem to forget that the majority of our best workers in the cabinet and herbarium have enjoyed experiences over land and amid sea, beside which their suburban walks and holiday excursions must look small indeed.

They forget, too, that among those naturalists, properly so called, who have not had the good fortune to enjoy the delights of travel and adventurous research, there are many who, through careful study of the works of the masters in science, and equally careful examination of the invaluable accumulations of natural objects brought together in museums through the toils and daring of true labourers in the field, have mastered, even to the minutest details, one or more departments of natural history, and thus duly qualified themselves for the high position and deserved authority conceded to them. Such is the author of the delightful volume now before us, filled as it is with the choicest fruits of extensive reading, not unmingled with original notes on the manners of living creatures and the organization of dead ones, many of them the result of attentive studies in that admirable school of 'vertebratology,' our unrivalled Zoological Gardens.* How the spirit of Gilbert White may find worthy work within the smoky boundaries of Regent's Park, such notices as the following graphic description of the snake-charming that not very long ago excited the unquenchable curiosity of Londoners will show :—

“On the 26th of May, the day on which I first saw the hippopotamus, I witnessed the performance of the Arab snake-charmers, of whom I have already spoken. After

* *Leaves from the Note-Book of a Naturalist.* By W. J. Broderip, Esq., F.R.S. J. W. Parker and Son.

their dinner they came from the giraffe-house, proceeding along the gravel-walk to the reptile-house, on the floor of which, about three o'clock in the afternoon, or a little later, the performance took place. The charmers took up a position at the end of the house, opposite to the lodging of the great Pythons, of whose size the old Arab had heard with something very like incredulity. The company stood in a semicircle, and at a respectful distance. There was not much difficulty in getting a front place, but those behind pressed the bolder spectators rather inconveniently forward.

“Standing in the open space the old Arab said something to the young one, who stooped down under the reptile cases on the north side of the room, and took out a large deal box with a sliding cover, which looked like a box for stowing away a set of Brobdignag chessmen, drew off the cover, thrust in his hand, and pulled out a large long naia haje. After handling it and playing with it a little while, he set it down on the floor, half squatted close to it, and fixed his eye on the snake. The serpent instantly raised itself, expanded its hood, and turned slowly on its axis, following the eye of the young Arab, turning as his head, or eye, or body turned. Sometimes it would dart at him, as if to bite. He exercised the most perfect command over the animal. All this time the old Arab stood still, pensively regarding the operation; but presently he also squatted down, muttering some words, opposite to the snake. He evidently affected the reptile more strongly than his more mercurial relative, though he remained motionless, doing nothing that I could see but fixing his eyes upon the snake, with his face upon a level with the raised head of the serpent, which now turned all its attention to him, and seemed to be in a paroxysm of rage. Suddenly it darted open-mouthed at his face, furiously dashing its expanded whitish-edged jaws into the dark hollow cheek of the charmer, who still imperturbably kept his position, only smiling bitterly at his excited anta-

gonist. I was very close, and watched very narrowly ; but though the snake dashed at the old Arab's face and into it more than twice or thrice with its mouth wide open, I could not see the projection of any fang.

“Then the old Arab, who, it was said, had had the gift of charming serpents in his family for a long series of years, opened another box, and took out four or five great lizards, and provoked the naia with them, holding them by the tails in a sort of four-in-hand style. Then the youth brought out a cerastes, which I observed seemed overpowered, as if, as the country people say, something had come over it. He placed it on the floor, but this serpent did not raise itself like the naia, but, as the charmer stooped to it, moved in a very odd, agitated manner, on its belly, regarding him askant. I thought the serpent was going to fly at the lad, but it did not. He took it up, played with it, blew or spit at it, and then set it down, apparently sick, subdued, and limp. He then took it up again, played with it a second time, gathered it up in his hand, put it in his bosom, went to another box, drew the lid, and brought out more snakes, one of which was another naia, and the others of a most venomous kind.”

If ever the unicorn be dethroned from his accustomed seat beside the royal arms, we hope his place may be taken by the hippopotamus. This charming monster has waggled his way into the affections of all true Britons, and in his present plump and happy-looking condition might fairly stand as an emblem of our country in its highest state of prosperity. Moreover, like a Briton, he is an amphibious animal, quite at home on the land, most active and formidable when in the water. The unicorn has never deigned to come among us, long as we have adored him ; the hippopotamus has not

only come, but made himself perfectly at home and happy among us. Everybody is interested in his progress, growth, and even in his companions; for assuredly his worthy and very intelligent Arab keeper shares in the general sympathy, and is gradually becoming as essential to the English nation as the royal coachman, or any other great officer of state. Every memorandum respecting our fat friend at the gardens has its value, and fortunate is he in being visited occasionally by Mr. Broderip. One note out of many about him, full of valuable data for his future biographer, we will quote:—

“6th October.—I to the Zoological Garden, and in my way to the hippopotamus came upon a late hatch of six young black swans not long out of the egg, walking with their affectionate mother, the proud father strutting in advance ready to do battle with all comers, and as if he defied the world. Looked in upon Jenny Lind, who had broken her horn at the base, or rather loosened it at the suture, so that it went quite back. But the keeper set it cleverly, and it is now in place, exalted like that of her namesake by Brother Jonathan; so that she carries her head as proudly and symmetrically as any giraffe of them all.

“The great tortoise had cuddled into a corner of his house, as if he felt the approach of winter.

“Hippo was in his bath. When he sinks he puts back his ears, and closes them to keep out the water. A large vegetable marrow was thrown to him by Hamet. He mumbled it for some time in the water, and below the surface as well as above, making an impression on the fruit but not breaking it. When below the surface he would let it out of his mouth, and then rise after it as it floated to the top, trying his young teeth upon it. At last his vegetable appetite appeared to be roused. He brought it to

one of the steps of his bath, and, reposing, set to work upon it in good earnest, with all but his head still in the water—succeeded in breaking it, bit off pieces, chewed them with a slow, champing, snapping motion, without any lateral grinding, and swallowed them. He had previously been offered green maize, which he mumbled, broke, and played with, but did not eat, so far as I could see. Boiled carrots and kohl-rübe were more to his taste; and he had eaten freely of them before the experiment of the raw vegetable marrow was made. All this looks like a healthy state of stomach, and I cannot help hoping that his careful attendants will bring him through the winter. He was rather fractious at first on being left, but is now reconciled to the absence of his kind Hamet at night, and sleeps by himself very comfortably. In short, his conduct entirely justifies the epithet conferred on him by Mr. Dickens, who has immortalized ‘The Good Hippopotamus.’”

Had it not been that this volume is a reprint of a series of papers that appeared originally in one of our best magazines, we should have commented more fully on, and given more ample specimens of, its amusing and instructive contents. It is sure to diffuse a sound taste for natural history, and can boast of literary merit equal to its scientific excellence. It is a fine example of the good services that can be rendered to science by the intellectual employment of the leisure hours of an accomplished gentleman, whose laborious public duties occupy no small portion of his time.

Great men, like lesser beings, have their foibles, which with them become magnified through contrast with greatness. Davy prided himself on his fly-fishing, not on his chemistry. He knew his own pre-eminence as a chemist, but was not quite sure of his claim to be a lawgiver among fishermen; consequently he grew vain about his doubtful rather than his legitimate pretensions. Many sapient fishermen in these times have questioned his dicta on the rod and line; nevertheless, he did more than most of them—ay, than all of them put together could do; he wrote a charming book about their craft, as pleasant to read in this its fourth edition, as when it appeared newborn from the press.*

People who have no personal acquaintance with philosophers believe them to be a grim and unamuseable race. We remember once witnessing the first introduction of a sound-headed country sportsman and an ingenious though unlearned sailor, neither of whom had ever sat side by side with professional men of science before, into a merry dinner-party of which all the other human elements were scientific. They were uneasy and out of their element until, to the surprise of each, one found a skilled and successful angler in the naturalist beside him, and the other a practical and experienced boatman in the geologist at his

* *Salmonia; or, Days of Fly-fishing.* By Sir Humphry Davy, Bart. Fourth Edition, with Illustrations. Murray.

elbow. We would undertake, without travelling far, to furnish philosophers of various scientific callings who could ride a race, hunt a fox, shoot a snipe, cast a fly, pull an oar, sail a boat, dance a polka, sing a song, or mix a bowl, against any man with unexercised brains, or even with none at all, in the United Kingdom.

There is no greater or perhaps more prevalent mistake, than the supposition that intellectual development is inconsistent with a keen sense of enjoyment. There are, it is true, a considerable number of grave, dull, would-be sages, moving at a snail's pace, with a snail's gravity, through society—looking, as Oken says of snails in his transcendental philosophy, like so many prophesying goddesses seated on tripods. But true spectral beings are shams. Nine out of ten of them maintain a philosophic fame only on the credit of an ominous and unbroken silence; the tenth, on the strength of supporting some incomprehensible paradox which neither he nor the stupid people who listen to him comprehend. Your real philosopher is neither uncommunicative nor dogmatic; he utters his words of wisdom at the right time and place, but on ordinary occasions is like other men, and enjoys himself perhaps even more intensely when enjoyment is afloat. Davy was one of these, as every true man of genius is and has been. Hence the unaffected enthusiasm with which Sir

Humphry plunged into stream and pool, and pursued his salmon-fishing hobby all over Europe.

And whilst the zest for pleasure humanizes the philosopher, his science and taste in turn elevate his pleasures. The objects of his sport become to him a source of interest such as they cannot be to common men. In their forms he delights to trace all-wise contrivance, and in their instincts the guidance of superhuman wisdom. He follows them to their haunts, marking every charm of the landscape on his way; and every turn and varying chance of his sport suggest reflections on men and things,—fanciful analogies it may be, but not the less true—such as give eloquence to his tale of adventure, and render the records of his amusements as classical as these ‘Conversations on Fly-fishing’ by Davy.

XII.

THE PLANTS OF THE SEA.

IF all the world should go to war and break itself up into rifle-corps, there is one class of men whom no amount of national disturbance could alienate, and who, whether Russians or Frenchmen, or Britons or Americans, will hold firmly by each other, and co-operate on as friendly terms as before. These are the naturalists. Of all existing races of human beings they are the most catholic and cosmopolitan in their notions and customs. If they do fall out—and, alas for humanity! they do sometimes—it is never about national questions or ethnical differences. Their energy and habits of fieldwork would doubtless adapt them for good riflemen; but their bullets could scarcely go straight if among their opponents were some distinguished for the love of similar pursuits; unless indeed the latter should be makers of bad species, in which case their fate would be doomed without hope of mercy. The mutual and unprejudiced assistance afforded by naturalists of all nations to

each other is one of the most charming and attractive features of their beautiful science. We have a noble example in the valuable and elegant work now before us.

Professor Harvey is one of the ablest and most philosophical of living botanists. He is an Irishman—Ireland may be proud of him—and holds the chair of Botany in the Royal Dublin Society, and the keepership of the extensive herbarium belonging to Trinity College, Dublin. The selection of so sound and distinguished an observer for the posts which he enjoys does great honour to the discrimination of the learned bodies with which he is officially connected. They could not have made a better choice. Popularly his name is familiar in connection with his very interesting and entertaining little work called ‘The Seaside Book.’ His fame with the multitude is however very small, compared with the honour assigned to him by his scientific peers. In the walk to which he has more especially directed his attention—the study of marine plants—he holds a pre-eminent place, and his authority as an algologist is admitted unreservedly by living botanists of all countries. His great work on the seaweeds of the British Islands, the ‘*Phycologia Britannica*,’ one of the most elaborate and beautiful scientific publications that have proceeded of late years from the British press, his ‘*Manual of British Marine Algæ*,’ and his ‘*Nereis Australis*,’ a history of the seaweeds

of the Southern Ocean, are productions, any one of them, enough to make the full-fledged fame of any ordinary *savant*. A more proper person than Professor Harvey could not have been selected for the elaboration of a 'Nereis Boreali-Americana,' and most honourable is it to the directors (we do not know their exact style) of the Smithsonian Institute of North America, that they should have selected this gentleman for the task of which we have now the first fruits.* The trustees of that establishment are pursuing a course which is sure to do much towards the wholesome development of science in the United States. In the present instance they have done what is both wise and generous, and, in seeking the best man to do the difficult work they require done, have recognized nobly the truth that science belongs to the world, to all mankind, labouring for the benefit of all regions and races alike.

The 'Nereis Boreali-Americana' is intended to contain descriptions, occasionally illustrated by coloured figures, of the marine algæ of North America. When complete, it will form a volume of between four and five hundred pages, enriched with sixty or more coloured plates. The first part, now before us, contains the olive-coloured kinds. It is a handsome, well-printed quarto. The figures of seaweeds are of peculiar excellence and accu-

* *Nereis Boreali-Americana*. Part I. By William Henry Harvey, M.D. Van Voorst.

racy, which last important quality is effectually secured by the circumstance of their being drawn upon stone by Professor Harvey himself. The text consists not of mere dry descriptions, but is enlivened by comments on the habit, physiology, and distribution of the objects of which it treats, and is preceded by a very full general introduction, containing the most popular and readable, and at the same time most scientific, general view of the subject we have ever met with.

On the east coast of North America the seaweeds are distributed in four provinces. The northernmost of these begins at Cape Cod, and extends to the Arctic regions. Within it are many species which range to the shores of Europe, more especially to the Norwegian coasts. South of this is a second, including Long Island Sound, and the New York District, where the Arctic forms disappear, and kinds of gulf-weed or *Sargassum* take their places, and where peculiar American species abound. A great part of these seem to be cut off and prevented ranging southwards by the long and unbroken line of sand that forms a seaweedless coast from south of New York to south of Cape Hatteras. On the shores of South Carolina a third set of algæ appear, among which some tropical forms are mingled. The commencement of a fourth and very strongly marked province is met with at the southern extremity of Florida, where the marine vegetation strikingly recalls that of the

Mediterranean Sea. This resemblance is seen not only in the aspect of the seaweeds, but also in the identity of numerous kinds. Out of one hundred and thirty species collected by Professor Harvey, at Key West, seven-eighths are unknown north of Cape Florida, whilst more than a third were identical with Mediterranean species. This is a striking and extraordinary fact, and cannot be explained by means of the distribution of currents, or course of the Gulf-stream at the present day. We must look to other physical arrangements than those which now prevail, for the true cause. There are corresponding phenomena in the distribution of animal life in these regions, and, when the whole of the facts shall have been properly compared and collated, we may fairly anticipate that they will support the views of those naturalists who maintain the ancient extension, previous to and partly during the glacial epoch, of the south-western lands of Europe and contiguous portion of Africa, far into the Atlantic, and towards the American shores, if indeed not continuous at one time with them. In the southernmost of the four provinces indicated by Dr. Harvey, beautiful green algæ of the *Caulerpa* group abound. These are the favourite food of turtles, and it is not improbable that those precious and dearly prized reptiles owe much of the delicacy and all the colour of their cherished green fat to the verdant seaweeds just mentioned. If seaweeds served mankind in no other method or

manner than this, they would still be deserving of respect. But they are infinitely more useful, and indeed it is very probable that without their aid the world would go wrong and become uninhabitable, since they purify water that would otherwise become stagnant. They are a positive benefit to animals, by constantly supplying oxygen to the atmosphere whilst they are alive, and when they die, seldom breed noxious vapours, but give out a scent rather wholesome than otherwise. Not a few afford food that is by no means to be despised; and though the illustrious Soyer himself could not persuade the people of Ireland to cook their 'dillisk,' and make nutritious soup of it—they, being of a somewhat savage nature, preferring their tangles raw—other nations know the value of the substance, and use it up in their dinner preparations. The Irish moss, so prized by invalids (when made into a sort of blanc-mange), is a seaweed, and the *Agal-Agal*, used largely by the Chinese and other Easterns for soups and jellies, and considered worthy of being exhibited at the Crystal Palace, is another. In Scotland and Norway the people feed cattle in winter on algæ, though, as Dr. Harvey remarks, they would possibly be blown on by a stall-fed short-horn that looks for vegetables of a higher order. There was a time when seaweeds made fortunes for those lucky individuals who had a strip of rock upon the coast bounding their estates; when a Highland peer pocketed

10,000*l.* per annum from kelp; and when, in the series of years commencing in 1720 and ending in 1800, no less a sum than 595,000*l.* was realized by the proprietors of kelp shores, their labourers and tenants, on the coast of Scotland alone, though these very people at the first proposal of the trade opposed it with all their might, and the full force of their ignorance and prejudices, and fought the battle against Fortune, who would visit them against their will, in the courts of law. Singular occurrences have happened within the last fifty years. How many men and towns opposed the passing of railways through their properties, vainly fearing evil where certain profit and benefit were the result!

Among the seaweeds described in the work before us are some very extraordinary sorts, especially such as are remarkable for their dimensions. These mostly belong to the Tangle or *Laminaria* tribe, of which great forests, with expanded, glossy, brown, leathery leaves, may be seen waving beneath the billows all around our own shores, immediately below the line of low-water mark, when the tide is out. On the north-west coast of North America there is a tangle named *Nereocystis*, having a stem which measures when full-grown 300 feet in length, and bears at its extremity a huge float six or seven feet long, shaped like an enormous cask, and crowned by a tuft of more than fifty forked leaves, each of them from thirty

to forty feet long ! Among this submarine foliage the sea-otter lies in wait for its prey, and when tired delights to rest and sleep on the enormous bladders. Yet all this mass of vegetation is moored by a stem as thin as whipcord. The Aleutians use these thread-like stalks for fishing-lines. Prodigious as are the dimensions of this 'sea-otter's cabbage' (the name by which it is popularly known), they are surpassed by those of the *Macrocystis*, a seaweed exceedingly remarkable on account of its extensive range, being distributed along the American shores of the Pacific from the Arctic to the Antarctic oceans. This astonishing alga grows to a length of nearly 1000 feet.

Such giants strike the beholder with wonder. Not less calculated than they are to excite our admiration are the dwarfs and atoms of vegetable life that cluster around them. Few forms of organized beings are more delicately beautiful than many of the smaller seaweeds, and the study of them with the aid of the microscope is a source of never-failing delight to all who engage in it. If any of our readers desire to enjoy a new pleasure, by employing their spare moments in acquiring a knowledge of the structure and forms of the plants of the sea, they cannot do better than make themselves conversant with the works of Professor Harvey.

5, HENRIETTA STREET, COVENT GARDEN,
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