I.

REFLECTIONS

ON THE

STUDY OF NATURE.

Translated from the Latin of the Celebrated
LINNAEUS.

" — look thro' Nature up to Nature's God."
Reflections on the Study of Nature

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INNOCUS

"- from a speech on the "Nature of God."

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TRANSLATOR'S PREFACE

TO THE FIRST EDITION.

THE little Tract now offered to the Public, is the Preface to the Museum Regis
Adolphi Friderici of Linnaeus; a work containing descriptions of the various na-
tural productions in the Museum of the late King of Sweden, printed in 1754, at
his Majesty's expence.

The Linnaean Library coming into the possession of the Translator, this publica-
tion particularly engaged his attention; as containing one of the best general views
of the economy of Nature that he has met with, as well as the most candid and
rational recommendation of the study of Natural History.

A desire of giving others the same pleasure which he experienced, has made him
attempt putting this Preface into an English dress; especially as the book to which
it belongs, one of the most superb and expensive of all Linnaeus's works, is very
little
little known in this country. The name of its Author, as Mr. Stillingfleet formerly remarked, is in every body's mouth; but probably many people have heard of him without precisely knowing how much the science of Natural History, and many useful arts, are indebted to him; and not a few have criticised his publications, without knowing anything of him, or understanding his works: time and experience, however, have established his merit, and nearly silenced all his opponents.

The dignity and importance of a philosophical enquiry into the works of Nature, are sufficiently proved in the following pages. At the same time, every attempt, however feeble, to add to the general stock of knowledge, should be encouraged; especially in a science founded, as this is, on observation. Even collectors of natural productions, who have little or no scientific knowledge, deserve commendation, as their labours are of use to those who have not the means of collecting for themselves.

All persons, however, who follow any particular
particular pursuit, are often exposed to very mortifying questions respecting the use of their enquiries. And it must be confessed, that the community has a right of examining every man’s employment, in order to give him his just degree of estimation as a member of society.

Questions of this nature coming from the generality of mankind, may be easily answered, by telling them some striking fact, in which their health, safety, or profit is concerned; or by giving the more sensible and ingenuous a view of something that may interest more amiable feelings. For the latter this little work is principally intended: those who have not time or inclination to look farther into the study which it treats of, may get some information from it, and may at least learn that this science richly deserves the attention of some part of mankind.

One fact, which all may learn from it, is, that the study of Nature does not necessarily tend to make a man irreligious, as some weak people have been made to believe.
believe. A number of illustrious examples might be produced to the contrary; none more eminent than the excellent Author of this work, whose unaffected cheerfulness and uniform benevolence gave, in his lifetime, the most unequivocal proofs of the goodness of his heart, as his various publications do of his genuine piety.

Indeed it is difficult to conceive how an opinion so absurd as the above could gain any ground: it must surely have been strengthened by the conduct of those triflers in philosophy, who mistake whim and affectation for genius; aim at, and imagine they attain, every science, by new paths untried before; and have a great facility at resolving every thing, which they cannot comprehend, into absurdity and imposition. Or it must have been countenanced by those pretenders to science, who having entered on a profession, the foundation of which ought to be the observation of Nature, think it necessary to affect universal knowledge. What these people cannot
cannot attain; they treat with contempt; they pollute the holy fountain of truth with their crude and often malicious effusions; and are only preserved from general scorn by the intricacy of Nature, and the short-sightedness of mankind.

Such critics as these frequently molest the patient traveller in the path of science, as well as the honest investigator of moral truth, with questions tending only to perplex, and with remarks less calculated to assist than to confound. Unprofitable indeed may that pursuit be esteemed, the prosecution of which is not preferable to a controversy with such men! He whose good-nature should induce him to try to enlighten them, would probably find them as incapable of improvement as of candour; as unskilful perhaps in what they ought to know, as illiberal in their censures of what they do not even profess to understand.

But nothing affords a more humiliating view of human wisdom, than when we see men of real learning and skill in particular branches,
branches, treating the scientific pursuits of others with contempt. How much soever such men may excel in their own science, and how lofty and important soever that science may be, they can neither be esteemed true philosophers, nor friends of mankind. A certain portion of enthusiasm in our favourite pursuits is natural; it is even necessary to the attainment of an eminent degree of success in them: but when it becomes inordinate, it is always ridiculous, and often guilty; it gives the world reason to suspect that its possessor has attached himself to a single branch or knowledge, at the expense of all wisdom and virtue besides.

The editor of this little work has taken the liberty of making the names of the animals mentioned in it agree with Linnaeus's last edition of his Systema Naturæ; in other respects the translation is in general pretty near the original: if it be found intelligible, the Translator's principal end will be answered.

June, 1785.
THOSE who visit museums of natural productions, generally pass them over with a careless eye, and immediately take the liberty of giving a decided opinion upon them. The indefatigable collectors of these things sometimes have the fate of being reckoned monsters: many people wonder at their great but useless labours; and those who judge most tenderly, exclaim, that such things serve to amuse persons of great leisure, but are of no real use to the community. It shall therefore be the business of this discourse to examine the design and end of such collections.

The knowledge of one's self is the first step towards wisdom: this was the favorite precept of the wise Solon, and was written
written in letters of gold on the entrance of the temple of Diana.

A man surely cannot be said to have attained this self-knowledge, unless he has at least made himself acquainted with his origin, and the duties that are incumbent upon him.

Men, and all animals, increase and multiply in such a manner, that, however few at first, their numbers are continually and gradually increasing. If we trace them backwards, from a greater to a lesser number, we at length arrive at one original pair. Now mankind, as well as all other creatures, being formed with such exquisite and wonderful skill, that human wisdom is utterly insufficient to imitate the most simple fibre, vein, or nerve, much less a finger, or other contriving or executive organ; it is perfectly evident, that all these things must originally have been made by an omnipotent and omniscient Being; for "he who formed the ear, shall he not hear? and he who made the eye, shall he not see?"
Moreover, if we consider the generation of Animals, we find that each produces an offspring after its own kind, as well as Plants, Tænias, and Corallines; that all are propagated by their branches, by buds, or by seed; and that from each proceeds a germ of the same nature with its parent; so that all living things, plants, animals, and even mankind themselves, form one "chain of universal Being," from the beginning to the end of the world: in this sense truly may it be said, that there is nothing new under the sun.

If we next turn our thoughts to the place we inhabit, we find ourselves situated on a vast globe of land and water, which must necessarily owe its origin to the same Almighty Being; for it is altogether made up of wonders, and displays such a degree of contrivance and perfection, as mortals can neither describe nor comprehend. This globe may therefore be considered as a museum, furnished with the works of the Supreme Creator, disposed in three grand classes.
If, in the first place, we consider the Fossil Kingdom, we shall see the manner in which water deposits clay; how it is crystallized into sand near the shore*; how it wears down shells into chalk, dead plants into vegetable mould, and metals into ochre; from all which substances, according to the laws of Nature, stones are formed: thus from sand originates whetstone, from mould slate, from chalk flint, from shells and earth marble, and from clay talc. In the cavities of these, concrete beautiful pellucid crystals, which consisting of various sides opposed to each other, form a number of regular figures, which the most ingenious mathematician could scarcely have invented, and among which the glittering gems and brilliant adamant find a place.

Here the ponderous and shining metals are constantly forming; the ductile gold†,

* This opinion of the crystallization of sand from water is disputed by the mineralogists of the present day.
† Lentum aurum.
which eludes the violence of fire, and which can be extended in length and breadth to an almost incredible degree: here is found the wonderful magnet, of which no mortal has hitherto been able to learn the secret law of its mutual attraction with iron, or of its constant inclination towards the poles.

The various strata of stones often concealed in the highest summits of the Alps, are most ancient monuments, which place before our eyes the many changes of the old globe, and proclaim them to us, whilst all other things are silent on the subject.

The innumerable petrifications of foreign animals, and of animals never seen by any mortal in our days, which often lie hid among stones under the most lofty mountains, are the only remaining fragments of the ancient world, and reach far beyond the memory of any history whatever.

So large a quantity of these and other stones covers the globe, that no man has hitherto been able to break through them, and
and penetrate to the originally created earth.

In the second place, the Vegetable Kingdom offers itself to our contemplation. Of all its productions, the first covering of the earth was furnished by the wintry mosses; of such variety in their forms, that they scarcely yield to herbs in number; and although extremely minute, yet of so admirable a structure, that they undoubtedly excel the stately Palms of India. These mosses are dried up in summer, but in winter they revive, and in the early spring guard the roots of other plants from cold, as they afterwards do from the injuries of summer suns.

For the gratification of our eyes, the earth is everywhere covered with verdure: there is no soil so rich or so barren, none so dry or so boggy, mountainous or marshy, exposed or shady, that some peculiar species of grass does not freely grow there, and fill up the interstices between other plants.

The widely disseminated herbs, distinguished
guished by the various forms of their leaves, flowers, and fruits, decorate the earth in the most agreeable manner; not one of them but has its end and office assigned it by the Supreme Governor of the world: numerous as they are, they most of them differ from one another in taste and smell, form and colour, powers and properties; but especially in their flowers, which attract our notice by their elegant variety; and in them we discover the amours of plants, by which, although unattended with sensation, they develope their internal structure*, and overspread the globe.

* This refers to a theory of the Author's, the solidity of which may be doubted. Those who wish to see more of it, may consult the Amoenitates Academicæ, Vol. vi. Dissertation 1.

Trees, whose roots being raised high above the earth, constitute what we call a stem, weave their branches into an agreeable shade, to defend the ground from excessive heat and cold, and to shelter men from the injuries of the weather.
The third division contains the Animal Kingdom, where the various kinds of worms silently occupy the bottom of the sea; some of which, united in a manner by social compact, build corals, others lead a solitary life concealed in their horny shells, which are constructed with such beauty and variety in their figures, that no human wisdom can trace them out or comprehend their numbers.

Such numberless swarms of armed insects fly about the earth, that their species are more numerous than all that the ground produces. These, in their infancy, are disguised in the form of caterpillars, in which state each has its proper plant assigned it, which it is appointed to inhabit and to feed upon, that the inordinate increase of any one may be prevented. Hence those vegetables whose luxuriant branches other animals cannot touch, either on account of prickles or height, or of a certain foetor or acrimony peculiarly obnoxious to their senses, are obliged to afford entertainment to a number of insects:
so that while many plants are destined to feed a very few species of these animals, the nettle affords subsistence to several different kinds; and trees, being out of the reach of quadrupeds, frequently support innumerable legions.

The dumb fishes which glitter at the bottom of the waters, and which surpass birds in number, find an ample repast prepared for them in the numberless worms which have their dwelling there: and at the summons of Venus they in their turns annually approach the shore in duly divided troops.

The winged inhabitants of the air, which excel all other animals in the beauty of their forms, find in the loftiest trees a rich provision of insects for their sustenance: here they modulate their harmonious throats to the tender melody of love, preparatory to their producing new tribes for the ornament of future seasons. Most birds migrate every year from the northern shores to countries nearer the sun; and, having reached their appointed distance,
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tance, return for the purpose of disseminating plants and fishes*.

Quadrupeds, which wander and sport in the fields, convert all other things to their use: by their joint endeavours they purge the earth from putrefying carcases; by their voracious appetites they fix bounds to the number of living creatures; they join in the contracts of love; and, when urged by hunger, unite in pursuit of their prey. Thus, whilst all things are purified, all things are renewed, and an equilibrium is maintained; so that of all the species originally formed by the Deity, not one is destroyed.

While we turn our minds to the con-

* Pulpy fruits are in general the food of a variety of birds as well as of quadrupeds; but the seeds which are contained in these fruits are of such a nature, that they almost always pass through the animal unhurt, and rather more fit for vegetation than before: thus they are transported to places far from their native soil. The spawn of fishes often shares the same fate.—See Linnaeus's Oratio de Telluris Incremento, Amoen. Acad. vol. ii. published in English by the Rev. Mr. Brand, among his Select Dissertations from the Amoenitates Academicæ.
templation of the beauties which surround us, we are also permitted to employ them for our benefit: For to what use would the sun display its beams? for what end would the spacious world be furnished by the great and bountiful Author of nature, were there no rational beings capable of admiring and turning it to their profit? The Creator has given us eyes, by the assistance of which we discern the works of creation. He has, moreover, endowed us with the power of tasting, by which we perceive the parts entering into the composition of bodies; of smelling, that we may catch their subtile exhalations; of hearing, that we may receive the sound of bodies around us; and of touching, that we may examine their surfaces; and all for the purpose of our comprehending, in some measure, the wisdom of his works. The same instruments of sensation are bestowed on many other animals, who see, hear, smell, taste, and feel; but they want the faculty which is granted us, of combining these sensations, and from thence...
drawing universal conclusions. When we subject the human body to the knife of the anatomist, in order to find in the structure of its internal organs something which we do not observe in other animals, to account for this operation; we are obliged to own the vanity of our researches: we must therefore necessarily ascribe this prerogative to something altogether immaterial, which the Creator has given to man alone, and which we call soul.

If therefore the Maker of all things, who has done nothing without design, has furnished this earthly globe, like a museum, with the most admirable proofs of his wisdom and power; if, moreover, this splendid theatre would be adorned in vain without a spectator; and if he has placed in it Man, the chief and most perfect of all his works, who is alone capable of duly considering the wonderful economy of the whole; it follows, that Man is made for the purpose of studying the Creator’s works, that he may observe in them the evident marks of divine wisdom.
Thus we learn, not only from the opinions of moralists and divines, but also from the testimony of Nature herself, that this world is destined to the celebration of the Creator’s glory, and that man is placed in it to be the publisher and interpreter of the wisdom of God: and indeed he who does not make himself acquainted with God from the consideration of nature, will scarcely acquire knowledge of him from any other source; for, “if we have no faith in the things which are seen, how should we believe those things which are not seen?”

The brute creation, although furnished with external senses, all resemble those animals which, wandering in the woods, are fattened with acorns, but never look upwards to the tree that affords them food; much less have they any idea of the beneficent Author of the tree and its fruit.

If our probation had been the only object of Divine Wisdom in forming the world, it would have been sufficient for
that wisdom, which does nothing in vain, to have produced an indigested chaos, in which, like worms in cheese, we might have indulged in eating and sleeping: food and rest would then have been the only things for which we should have had an inclination; and our lives would have passed like those of the flocks, whose only care is the gratification of their appetite. But our condition is far otherwise.

For the Author of eternal salvation is also the Lord of nature. He who has destined us for future joys, has at present placed us in this world. Whoever therefore shall regard with contempt the economy of the Creator here, is as truly impious as the man who takes no thought of futurity. And in order to lead us toward our duty, the Deity has so closely connected the study of his works with our general convenience and happiness, that the more we examine them, the more we discover for our use and gratification. There is no land so barren and dreary, that any one who should come there need perish with
with hunger, if he knew the bodies which it produces, and how to use them properly; and we see constantly, that all rural and domestic economy, founded on the knowledge of nature, rises to the highest perfection, whilst other undertakings, not deduced from this science, are involved in insurmountable difficulties.

The magnificence and beauty, the regularity, convenience, and utility of the works of creation, cannot fail to afford man the highest degree of pleasure; so that he who has seen and examined most of these, must the more perfectly admire and love the world as the work of the great Creator, and must the more readily acquiesce in his wise government. To be an interpreter of the perfect wisdom of an infinite God, will by him be esteemed the highest honour that mortals can attain. Can any work be imagined more forcibly to proclaim the majesty of its author, than a little inactive earth rendered capable of contemplating itself as animated by the hand of God? of studying the dimensions

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and
and revolutions of the celestial bodies, rolling at an almost infinite distance, as well as the innumerable wonders dispersed by the Creator over this globe? in all which appear manifest traces of divine wisdom and power, and the consideration of which affords so much delight, that a man who has tasted it would cheerfully prefer it to all other enjoyments.

Nature always proceeds in her accustomed order, for her laws are unchangeable; the omniscient God has instituted them, and they admit of no improvement.

It is so evident that the continent is gradually and continually increasing by the decrease of the waters, that we want no other information of it than what nature gives us: mountains and valleys, petrifications and the strata of the earth, the depths of the ocean and all the various kinds of stones, proclaim it aloud. As the dry land increases at this day, so it is probable that it has all along gradually extended itself from the beginning: if we therefore enquire into the original appearance
ance of the earth, we shall find reason to conclude, that instead of the present wide-extended regions, one small island only was in the beginning raised above the surface of the waters.

If we trace back the multiplication of all plants and animals, as we did that of mankind, we must stop at one original pair of each species. There must therefore have been in this island a kind of living museum, so furnished with plants and animals, that nothing was wanting of all the present produce of the earth. Whatever nature yields for the use or pleasure of mankind was here presented to our first parents; they were therefore completely happy. If that favoured man was obliged to acquire the knowledge of all these things in the same order, and according to the same laws of nature to which we are subject, that is, by means of the external senses; he must have taken a view of the nature, form, and qualities of each animal, in order to distinguish it by a suitable name and character: so that the chief employ-
ment of the first man, in this garden or museum of delights, was to examine the admirable works of his Creator.

Among the luxuries therefore of the present age, the most pure and unmixed is that afforded by collections of natural productions. In them we behold offerings as it were from all the inhabitants of the earth; and the productions of the most distant shores of the world are presented to our sight and consideration: openly and without reserve they exhibit the various arms which they carry for their defence, and the instruments with which they go about their various employments; and whilst every one of them celebrates its Maker’s praise in a different manner, can anything afford us a more innocent pleasure, a more noble or refined luxury, or one that charms us with greater variety?

To man, made for labour, due intervals of relaxation are no less necessary, than sleep is to the body when exhausted by watching; and truly unhappy may that mortal be reckoned, to whom nothing affords
fords amusement. He who is exhausted by the more weighty labours, has the greatest need of rest: but rest, not tempered with pleasure, becomes torpid insensibility. The principal reward of labour, which the Creator has granted to man, is leisure with enjoyment; and mortals generally exert their utmost efforts to obtain it.

Almost all princes have had their favourite amusements to refresh them when fatigued with business. Some of them, in early times, when men had scarcely left off eating acorns, employed their leisure hours in feasting and dancing, in games and useless sports, wrestlings, or other public exhibitions, in hunting parties, or in the seraglios of women: but when the fields began to glow with the riches of Ceres, these lords of the earth sought for more refined gratifications; and at length some of them have employed their leisure hours in collecting Nature's productions. Fame has long celebrated the museum of the Grand Duke of Tuscany. The Queen of
of Portugal is at present engaged in making a collection. The Kings of Spain have bestowed more attention and expense in this way than any other princes; by their means the rich stores of America have been fought out and examined. The museum of the King of France has scarcely its equal in the world. The Empress Queen of Hungary has ordered all kinds of natural curiosities to be bought for her. The Parliament of England has purchased the excellent collection of Sir Hans Sloane, and dedicated it to public use. The Stadtholder of the United Provinces, a little before his death, fitted up a museum at Leyden; and Peter I. Emperor of Muscovy, has taken care to buy up all the collections of this kind that he could meet with, in order to enrich a museum with them at Peterburg.

In this manner, the pleasure which results from contemplating the wisdom of the Creator in his works, has been diffused over the globe, and has entered the palaces of princes.
Our august Monarch, with his Royal Consort, are the first Swedish sovereigns who have fostered these sciences. His Majesty has adorned his splendid museum, in the palace of Ulricsdahl, with a variety of quadrupeds preserved in spirits of wine, a great number of stuffed birds, an innumerable quantity of insects and shells arranged in cabinets: not to mention the valuable Herbarium, and the beautiful Menagerie in which living beasts and birds are kept.

The Queen has taken delight in collecting insects and shells, as well as corals and crystals, from all parts of the world; and has ornamented her palace of Drottningholm with them so successfully, that I doubt whether any other collection of the kind can be compared to it. Thus does this royal pair take pleasure in contemplating the wonderful works of the Creator; and daily behold in them, as in a glass, the signs of his wisdom and goodness.

As the manners and customs which prevail in the world always take their rise in the
the courts of Princes, as from a never-failing spring; whatever magnificence or vanity, whatever luxuries or amusements, whatever conversation and opinions reign there, are for the most part diffused through the whole kingdom: happy is that people who may learn from their superiors to love the works of nature; inasmuch as they beget a veneration for the Deity, and lay the foundation of all oeconomy and public felicity.

I know not what to think of those people who can, without emotion, hear or read the accounts of the many wonderful animals which inhabit foreign countries.

What principally strikes us agreeably at first sight is colour; of which the good and great Creator has given to some animals a rich variety, far beyond the reach of human art. Scarcely any thing can equal the beauty of birds in general; particularly the brilliant splendour of the Peacock. India, indeed, boasts a number of fishes, whose painted scales almost equal the plumage of birds in beauty; not to mention
mention the Indian fishes, *Trichiurus Lepturus* (Sword-fish of Brown's Jamaica) and *Zeus Vomer*, whose brilliant white colour excels the purest and most polished silver; or the Gold-fish (*Cyprinus aureus*) of the Chinese, which shines with such golden splendour, that the metal itself is by no means comparable to it. People of rank in India keep the last-mentioned fish alive in their apartments in earthen vessels, as in fish-ponds, and feed them with their own hands, that they may have something to excite admiration perpetually before their eyes. The Author of nature has frequently decorated even the minutest insects, and worms themselves, which inhabit the bottom of the sea, in so exquisite a manner, that the most polished metal looks dull beside them. The great Golden Beetle (*Buprestis gigantea*) of the Indies has its head studded with ornaments like precious stones, brilliant as the finest gold *

* This description is not so applicable to the *Buprestis gigantea* as to the *Buprestis sternicornis*; for the head of the
and the *Aphrodita aculeata*, reflecting the sun-beams from the depths of the sea, exhibits as vivid colours as the Peacock itself spreading its jewelled train.

The difference of size in different animals must strike us with no less astonishment: especially if we compare the huge Whale with the almost invisible Mite; the former, whilst it shakes the largest ships with its bulky body, is itself a prey to the diminutive *Oniscii*, and is obliged to have recourse to marine birds, who, sitting on its back, free it from these vermin.

We are as much amazed at the prodigious strength of the Elephant and Rhinoceros, as we are pleased with the slender Deer of Guinea (*Moschus pygmeus*), which is, in all its parts, like our Deer, but scarcely so large as the smallest Lap-dog: Nature has, however, in the nimbleness of the former is not remarkably brilliant, while both the head and thorax of the latter may justly be compared to gold studded with jewels: but even this animal must yield the palm to some other species of the same splendid family.
its feet, abundantly compensated this animal for the smallness of its size.

The great Ostriches of Arabia, whose wings are insufficient to raise their bulky bodies from the ground, excite no less admiration than the little Humming-birds of India, hardly bigger than Beetles, which feed on the honey of flowers, like bees and flies, and, like those animals, are the prey of ordinary Spiders; between which and the large Spider of Brazil (*Aranea avicularis*) there is as much difference in size as between the Humming-bird and the Ostrich. This great Spider often attacks the largest birds, dropping on their backs, by means of its web, from the branches of trees; and while they vainly seek for security in flight, it bites them, and sucks their juices in such a manner, that they not unfrequently fall lifeless to the ground.

The singular figures of some animals cannot fail to attract our notice. We wonder, with reason, at the angular appendage to the nose of the American Bat: nor is the short and slender upper mandible
dible of the Indian Woodpecker (*Picus semirostris*) less remarkable; the form of the latter being as unusual among birds as is among fishes the figure of the American Fishing Frog (*Lophius Histrio*), which is furnished with feet, but cannot walk; while another kind of fish (*Silurus Callichthys*), when the rivulet which it inhabits becomes dry, has a power of travelling over land till it finds more copious streams.

The Plaice, the Sole, and many other fishes which constitute the genus of *Pleuronecles*, although the only animals which have both eyes on the same side of the head, do not, perhaps, astonish us so much, being common fishes, as the Horned Frog of Virginia (*Rana cornuta*), whose head is furnished with a pair of horns, at the extremities of which its eyes are placed; its stern aspect cannot fail to strike with horror all who behold it. This frog is unable, however, to move its eyes in different directions at the same time, like the Chamæleon, which appears to have a power of contemplating at once many distant
distant objects, and of attending equally to all: for this last animal certainly does not live upon air, as many have reported, but on flies, which it follows with its piercing and sparkling eyes, till it has got so near them, that by darting forth its long tongue they are instantly caught and swallowed. While the slender Ant Bear (*Myrmecophaga*), which has no teeth, and which the Creator has appointed to live upon ants alone, by coiling up its tongue like a serpent, and laying it near an ant-hill, collects the little animals, and devours them entire.

He who has given life to animals, has given to them all different means of supporting it: for if all birds were to fly in the same manner, all fishes to swim with the same velocity, and all quadrupeds to run with equal swiftness, there would soon be an end of the weaker ones.

That wisdom which deliberates on all future events, has covered the Porcupine-fish (*Diodon Hystric*), like the Hedgehog, on every side with a strong guard of thorns;
has bestowed on the Armadillo (*Dasypus*), as on the Tortoise, a hard shell, in which it rolls itself up, and bids defiance to its enemies; and has enveloped the *Loricaria*, like the Canada Pike (*Esox*), with a coat of mail.

The same Almighty Artist has given the Flying Squirrel (*Sciurus volans*) a power of extending the skin on each side of its body in such a manner, that, being enabled to descend by a precipitate flight from one branch to another, it easily avoids its enemies. He has affixed wings to the sides of the little Dragon (*Draco volans*), with which, by the help of its feet, it supports itself in the air in the manner of a Bat. Thus also has he lengthened out the fins on the breast of the Flying Fish, that it might seek for safety in the air, when pursued by its enemies in the water: and he has likewise formed an appendage to the tail of the great Cuttle-fish (*Sepia Loligo*), by means of which it springs out of the sea; at the same time being furnished with a bladder, full of a sort of ink, with which
which it darkens the water, and eludes the sight of its pursuers.

Other animals are preserved by means of their dismal cries, as the Capuchin Monkey (Simia Capucina), whose horrid yellings are intolerable to the ears; and the Sloth (Bradypus), whose piercing voice puts all the wild beasts to flight, like horses at the sound of a rattle. The flow-paced Maucauco (Lemur tardigradus) is supplied with double ears, that he may betake himself to the trees in time to avoid danger; there he gathers the fruit in safety, always first tasting what he presents to his mate. The Creator has indulged the Opossum with a retreat for her young-in her own body, to which they betake themselves in case of an alarm; and, lest cruel hunger should force them from this asylum, it is furnished with internal nipples, affording them a welcome nourishment. The Torpedo, of all animals the most tender and flow-paced, and therefore most obnoxious to the attacks of others, has received from its Maker a power denied
denied to other creatures, of giving those who approach it a shock, of such a nature, that none of its enemies can bear it.

Truly formidable are the arms which the Lord of nature has given to some animals. Though he has left serpents destitute of feet, wings, and fins, like naked fishes, and has ordered them to crawl on the ground exposed to all kinds of injuries, yet he has armed them with dreadful envenomed weapons: but, that they may not do immoderate mischief, he has only given these arms to about a tenth part of the various species; at the same time arraying them in such habits that they are not easily distinguishable from one another, as the rest of animals are; so that men and other creatures, while they cannot well distinguish the noxious ones from those which are innocent, shun them all with equal care. We shudder with horror when we think of these cruel weapons. Whoever is wounded by the Hooded Serpent (*Coluber Naja*) expires in a few minutes; nor can he escape with life who
is bitten by the Rattle-snake (*Crotalus horridus*) in any part near a great vein. But the merciful God has distinguished these pests by peculiar signs, and has created them most inveterate enemies; for, as he has appointed cats to destroy mice, so has he provided the Ichneumon (*Viverra Ichneumon*) against the former serpent, and the Hog to persecute the latter. He has moreover given the *Crotalus* a very slow motion, and has annexed a kind of rattle to its tail, by the shaking of which it gives notice of its approach: but, lest this slowness should be too great a disadvantage to the animal itself, he has favoured it with a certain power of fascinating squirrels from high trees, and birds from the air into its throat, in the same manner as flies are precipitated into the jaws of the lazy toad*.

*This opinion of the fascinating power of the Toad has been refuted, and the appearance which gave rise to it fully accounted for, by Mr. Pennant, in his British Zoology. Probably the story of the Rattle-snake's having a similar power might be found equally false, if enquired*.
On account of these and various other poisonous serpents and worms of India, which crawl upon the ground, swim in the waters, or twine among the branches of trees, we prefer our barren and craggy woods to the ever-blooming meadows and fruitful groves of Indian climes; and we had rather suffer the inconveniences of our northern snows, than enjoy their enviable luxuries. We fear no threatening scorpions, which disturb the peace and rest of those who inhabit a warmer climate; nor is our sweet sleep interrupted by the Sclopendreæ, to guard against which fires are obliged to be carefully kept up all night in India. Our waters are not infested, like those of some other countries; nor do they produce fish whose flesh is poisonous, like the Hare Globe-fish (Tetrodon lagocephalus) of the Chinese; nor any whose enquired into with the same degree of accuracy.—See a "Memoir concerning the fascinating faculty which has been ascribed to the Rattle-snake and other American Serpents." By B. S. Barton, M. D. Philadelphia, 1796. 8vo. 70 pages.
bite is venomous, except the *Muræna Helena*, a very rare fish; neither have we any that wounds with poisonous prickles, except the Weever (*Trachinus Draco*), which we can easily avoid. Sharks, which dismember the inhabitants of the eastern world, and devour them in the water, are almost unknown on our shores; as are Crocodiles, which ascend the sides of vessels and take away men for their prey. The ravages of the last-mentioned animal, however, the Creator has restrained within very narrow limits; not only by means of the cruelty with which it devours its own young, and of the bird which destroys its eggs; but also by the Striped Lizard (*Lacerta Monitor*), which informs men of the approach of the Crocodile, as the Great Butcher-bird (*Lanius Excubitor*) warns lesser birds of that of the Hawk. Just in the same manner the human race are preserved from Lions and Tigers, by means of the Little Lizard, called *Gecko*; which being alarmed for its own safety, runs hastily to man, as its guardian angel, and
and acquaints him with his danger: thus also the Storm Finch warns mariners of an approaching tempest.

But the curious properties of exotic animals are so many, that we have only room to mention a few more of the most remarkable. For example; the Surinam Toad (Rana Pipa) nourishes its young on its back, as cattle do the Gadfly. And this is more truly worthy of our admiration than the Salamander, which was believed by the ancients to live in the fire; or the Frog-fish (Rana paradoxa), which was till very lately supposed to be transformed from a toad to a fish. The Black Tortoises always leave the recesses of the sea, to seek out the shores of desert and desolate islands, in the sand of which they deposit their eggs: thus they fall a prey to sailors, who refresh their sick with the delicate flesh of these animals; which is much more wholesome, although less delicious, than that of the Guana (Lacerta Iguana), the latter being prudently avoided by those who have been too incautious in
in their sacrifices to Venus. Any one who happens to see, in the Indian woods, the falling leaves of trees apparently become alive, and creep upon the ground *, probably beholds them with no less pleasure than he would the phosphorescent Sea Pens, which cover the bottom of the ocean.

* The appearance here alluded to is caused by the different species of Mantis, a kind of insects, whose wings so exactly resemble the leaves of many trees, both in texture and colour, that inaccurate observers, seeing them fall from the branches, and immediately afterwards creep or fly away, conceived the idea of the wonderful and indeed impossible transformation of a leaf into an animal; an idea which is still fi;lenuously supported by many persons who are more used to see, than to reflect on what they behold. Such striking appearances as the above were surely designed to excite our curiosity, and they cannot fail to awaken that of the most inattentive. Many operations of nature, however, which are constantly going on before our eyes, although less striking, are no less curious; nor ought we to suffer our attention to be so far engaged by the wonders of foreign countries, as to neglect the productions of our own; which, besides being more easily examined, are probably more likely to be serviceable in the improvement of our domestic and rural economy.

and
and there cast so strong a light, that it is easy to count the fishes and worms of various kinds sporting among them. The Sucking-fish (*Echeneis Remora*), which of itself could not without great difficulty swim fast enough to supply itself with food, has obtained from its Creator an instrument not much unlike a saw, with which it affixes itself to ships, and the larger kinds of fishes, and in this manner is transported gratis from one shore of the world to another. The same Divine Artificer has given the sluggish Fishing Frog (*Lophius piscatorius*) a kind of rod, furnished with a bait, by which it beguiles little fishes into its jaws*.

Thus he who views only the produce of his own country, may be said to inhabit a single world; while those who see and consider the productions of other climes, bring many worlds, as it were, in review before them.

Of these wonderful animals travellers

* See Pennant’s British Zoology.
have told us much; all accounts of voyages mention them. We may gather knowledge from the accounts of others; but it is much more pleasant to see things with our own eyes. In this Royal Museum these astonishing creatures are preserved, exhibiting, as nearly as possible, the appearance which they made when living on the theatre of the world; a most magnificent spectacle to an admirer of the Divine Wisdom!

Man, ever desirous of knowledge, has already explored many things; but more and greater still remain concealed; perhaps reserved for far distant generations, who shall prosecute the examination of their Creator's works in remote countries, and make many discoveries for the pleasure and convenience of life. Posterity shall see its increasing Museums, and the knowledge of the Divine Wisdom, flourish together; and at the same time all the practical sciences, antiquities, history, geography, natural philosophy, natural history, botany, mineralogy, dietetics, pathology,

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