

Among migrating birds it is not very uncommon for the males alone to dare the dangers of a distant voyage, and to leave the females behind them: but in the fringilla *Celebs*, or chaffinch, we find this rule completely inverted; for the female chaffinches of Sweden quit their males and migrate to Holland towards the winter, and duly return to them in the spring; while many of the males indulge in a profound sleep during the greater period of their absence. Most vegetables indulge in a winter-sleep of the same kind; but there are some that sleep still longer. Thus the tuberose root of the ferraria *Ferrariola*, an ornamental herbaceous plant of the Cape of Good Hope, remains torpid every alternate year, and sometimes continues in this state for two years together, without putting forth either leaf or fibre.

Let us close these observations with a momentary glance at the very singular instinctive powers of the cancer *ruricola*, or land-crab. This is an inhabitant of the tropical regions, and especially of the Bahama islands: it is gregarious, and associates in large bodies that preserve an orderly society, for the most part, in the recesses of inland mountains, though they regularly once a year march down to the seaside in an army of some millions, to deposit their spawn in the ocean. The time selected for this expedition is usually the month of May, when they sally forth from the stumps of hollow trees, the clefts of rocks, and subterranean burrows, in enormous multitudes. The whole ground, indeed, is covered with this reptile band of adventurers; and no geometrician could direct them to their destined station by a shorter course. They turn neither to the right hand nor to the left, whatever be the obstacles that intervene: and if they meet with a house they will rather attempt to scale the walls than relinquish the unbroken tenor of their way. Occasionally, however, they are obliged to conform to the face of the country; and if it be intersected by rivers, they pursue the stream to its fountain head. In great dearth of rain they are compelled to halt, when they seek the most convenient encampment and remain there till the weather changes. They make a similar halt when the sun shines with intense heat, and wait for the cool of the evening. The journey often takes them up three months before they arrive on the seacoast; as soon as they accomplish which, they plunge into the water, shake off their spawn upon the sands, which they leave to nature to mature and vivify, and immediately measure back their steps to the mountains. The spawn, thus abandoned, are not left to perish: the soft sands afford them a proper nidus; the heat of the sun, and the water, give them a birth; when millions of little crabs are seen crawling to the shore and exploring their way to the interior of the country, and thus quitting their elementary and native habitation, for a new and untried mode of existence. It is the marvellous power of instinct that alone directs them, as it directed the parent hosts from whom they have proceeded; that marvellous power which is co-extensive with the wide range of organic life, universally recognised, though void of sensation; consummately skilful, though destitute of intelligence; demanding no growth or developement of faculties, but mature and perfect from its first formation.

The general corollary resulting from these observations is as follows: that instinct, as I have already defined it to be, is the operation of the principle of organized life by the exercise of certain natural powers, directed to the present or future good of the individual; while reason is the operation of the principle of intellectual life by the exercise of certain acquired powers directed to the same object: that it appertains to the whole organized mass, as gravitation does to the whole unorganized; equally actuating the smallest and the largest portions, the minutest particles and the bulkiest systems; every organ and every part of every organ, whether solid or fluid, so long as it continues alive: that, like gravitation, it exhibits, under particular circumstances, different modifications, different powers, and different effects; but that, like gravitation, too, it is subject to its own division of laws, to which, under definite circumstances, it adheres without the smallest deviation; and that its sole and uniform aim, whether acting generally or locally, is that of perfection, preservation, or reproduction.

Of its mode of existence we know nothing: but as little do we know of the principle of gravitation or of mind. We can only assure ourselves that they are distinct powers, perhaps distinct essences; and we see them acting, as well separately as conjointly, for the general good. Under their accordant influence we behold the plastic and mysterious substance of matter, which we must be especially careful not to confound with themselves, rising from "airy nothing" into entity; ascending from invisible elements into worlds and systems of worlds; from shapeless chaos and confusion, into form, and order, and harmony; from brute and lifeless immobility, into energy and activity; into a display of instinct, feeling, perception; of being, and beauty, and happiness. One common design, one uniform code of laws, equally simple and majestic, equally local and comprehensive, pervades, informs, unites, and consummates the whole. The effect, then, being one, the mighty cause that produced it must be one also; an eternal and infinite unity—the radiating fountain of all possible perfections—ever active, but ever at rest—ever present, though never seen—immaterial, incorporeal, ineffable: but the source of all matter, of all mind, of all existences, and all modes of existence. Whatever we behold is God—all nature is his awful temple—all sciences the porticoes that open to it: and the chief duty of philosophy is to conduct us to his altar; to render all our attainments, which are the bounteous affluents of his spirit, subservient to his glory; and to engrave on the tablet of our hearts this great accordant motto of all natural and all revealed religion, of Athens and of Antioch, of Aratus and of St. Paul, "in him we live, and move, and have our being."

Ἐκ Διὸς ἀρχόμεθα—
πάντη δὲ Διὸς κεχρημέθα πάντες·
Τοῦ γὰρ καὶ γένος ἐσμέν.*

LECTURE VI.

ON SYMPATHY AND FASCINATION.

We have now summarily contemplated several of the most important phenomena both of organic and inorganic nature; and have traced out something of the laws by which these phenomena are produced and regulated. Among the most extraordinary facts that have occurred to us may, perhaps, be enumerated the occasional production of effects by causes which do not appear to be immediately connected with them; the operation of one body upon another remotely situated, and which, so far as we are able to trace them, have no medium of communication. The sun is perpetually acting upon and influencing the earth, the earth the moon, the moon the ocean: the magnet operates upon iron, whatever be the sheet of substance interposed; and if the iron be divided into small filings, so that the different particles may move with facility, communicates to each an obvious polarity, and gives to the whole a peculiar and beautiful arrangement. And the repulsive and attractive powers of the electric fluid are supposed to act upon each other, not only where two or more particles of this fluid are perfectly or very nearly in contact, but between all particles of it, at all distances, whatever obstacles may lie between them.†

Chemical science lays open to us a wonderful field of similar affections and affinities. Within the range of its peculiar regions, we behold almost every substance evincing a determinate series both of inclinations and of antipathies, strongly attracted by one kind of material, indifferent towards a second, and powerfully avoiding a third. From these extraordinary endowments proceeds unquestionably the union or separation of different bodies,

* Arat. Phenom. 1. 4, 5.

† Young's Lectures, vol. i. p. 659.

according to the nature of the endowments that are called into action; but their influence, in perhaps every case, commences before such bodies are in a state of contact, and in many cases while they are at a considerable distance from each other.

From lifeless and inorganic matter these peculiar and mysterious affections ascend to vegetable life, and display to us germs, molecules, and fibrils, uniting not at random with germs, molecules, and fibrils, but each selecting the other, and occasionally attracting them from remote situations, the female male, and the male female rudiments; and this with the nicest discrimination of their various powers of crassitude or tenuity, and, consequently, of reciprocal adaptation, without which no vital entity would ensue. Perhaps one of the most extraordinary instances of this kind we are acquainted with exists in the *valisneria spiralis*, an aquatic and dioecious plant, or one belonging to that class in which the male and the female are distinct individuals. The male has a long spiral stem, by which its flower is enabled at all times to adapt itself to the surface of the water, from the bottom of which the plant shoots forth, and to float in the middle of tide-streams of almost every variation of ascent. The stem of the female is straight, and much shorter; and is hence only found in shallow waters, or on shores, where the tide exerts but little influence. Thus differently formed and remotely situated, how is that union to take place, without which there could be no increment, and the *valisneria* would be blotted out of the book of vegetable life. The whole process is wonderful; a part of it is obvious, but the rest is concealed. As soon as the male flower is become perfected, the spirial stem dries away, and the flower separates itself from it, and sails gallantly over the water in pursuit of the female, for the most part driven, indeed, by a current of the wind or of the stream; yet as soon as it arrives within a certain range of the female, it obeys a new influence, and is attracted towards it in various instances even in opposition to wind and tide, the powers that have hitherto directed it. What, now, is this stupendous influence that thus operates at a distance, and gives to the male flower a new direction? It may possibly be a peculiar kind of odour or aroma; and, perhaps, this is the most philosophical way of accounting for the fact: but however philosophical, it is altogether hypothetical, for we are incapable of ascertaining, and know nothing of the existence of any such exhalation; and could we detect it, we should be still totally ignorant of its mode of operation.

The same curious phenomena seem not unfrequently to take place in the animal system: for here also we can truly affirm that bodies appear to act where they are not, and where we can trace no communicating medium. A small laceration on one of the fingers, sometimes in our own country, but far more frequently in warmer climates, will produce, if unattended to, the disease of a locked jaw; and an inflammation or abscess of the liver a severe pain in the left shoulder. Yet in both these cases we are not distinctly acquainted with any closer connexion subsisting between the finger and the jaw, or the liver and the left shoulder, than there is between these different organs and any other part of the system. We may theorize upon the nature of the communication, but we have no certain knowledge.

The same fact is strikingly exemplified in the different operations of different poisons when introduced into the stomach. Thus it has been observed by Mr. Brodie, in a valuable and ingenious paper, published in the *Philosophical Transactions* for 1811, that the infusion of tobacco, applied to any part of the alimentary canal, almost instantaneously, and apparently by some other means than that of the circulation of the blood, destroys the action of the heart, and consequently stops the pulsation, while the brain and the other muscles of the system, besides the heart, are comparatively but little affected: and that alcohol, on the contrary, the essential oil of almonds, and the juice of aconite, destroy as rapidly the action of the brain, and throw the animal into violent convulsions, laborious respiration, and deadly stupor, while the heart continues its usual or nearly its usual pulsation, not only during the whole of the symptoms, but for some minutes after death has actually taken

place. The *woorara*, perhaps a species of *ticunas*, with which the Indians of Guiana poison the points of their arrows, produces the same effect, when inserted into a wound, as aconite juice introduced into the stomach: it operates almost entirely upon the organ of the brain, and more rapidly than it could arrive there by the course of the circulation. The *upas Antiar*, the anthiar *Toxicaria* of Leschenaut, on the contrary, one of the most fatal vegetable poisons of the island of Java, produces death when inserted into a wound, not by affecting the brain, but, like the infusion of tobacco in the stomach, by destroying the action of the heart.

In like manner, the poison of the cerastes, or horned snake, though so fatal in a few hours, often in a few minutes when received by a wound, seems to produce little or no effect when tasted and swallowed. "It is clear," says Bruce, "the poison has no activity, till through some sore or wound it is admitted into circulation.*" And a German physician (continues he) was bold enough to distil the pus or putrid matter flowing from the ulcer of a person infected by the plague, and taste it afterward without bad consequences."

Of the immediate cause or nature of this diversity of influence—this discrepancy of action between remote organs, we know no more than we do of the cause or nature of gravitation, of magnetism, or electricity. It has been denominated, indeed, *sympathy*, *fellow-feeling*, or *consent of parts*, in the general language of physiological writers; and so long as we employ these terms merely to import a definite kind or peculiarity of impulse, they may have their use and convenience; but they convey no knowledge, and ought not to be allowed, as I am afraid they sometimes are, to supply the place of knowledge. That the muscles of the jaw-bone sometimes associate in their action with the muscles of the hand or foot; the organ of the left shoulder with that of the liver; and the stomach, under some kinds of stimulus, with the brain; under others with the heart; and under a third sort, as all those that excite nausea, with the skin; while the skin, in return, associates very generally with the action of the kidneys, are ascertained and well-established facts; but why they should be facts, or by what power or medium the association is maintained, we are altogether ignorant.

When the circulation of the blood was first discovered, it was supposed that all these anomalies might fall within the range of this admirable mechanism, and might be explained by its operation. Not one of them, however, is capable of such an explanation. Nor is even the diffused redness which uniformly takes place around the nucleus of an inflamed part in any degree more intelligible or more referrible to this principle; since, in consequence of the device of a circulating system, the vessels in the immediate vicinity of each other are as much cut off from all direct communication as those at the remotest distance; and only, so far as we are able to trace by ocular experiment, associate by the common current of the blood. That they do, in fact, associate by other means we know; but it is by means altogether concealed from us: it is by what, as already observed, we call sympathy or fellow-feeling; but what we only call so to express a peculiarity of action, the cause of which we are incapable of penetrating.

There is one curious and highly important discovery in the animal economy, however, that has been made, or rather completely established, within the last two or three years, which seems to show that such associate action of parts, at a distance from each other, may be the result of a direct intercourse or medium of communication, though the connecting channel is too subtle for pursuit: for it seems now to be ascertained, as it had, indeed, been long suspected, though without the proof of actual experiment, that a variety of substances pass from the stomach into the kidneys, apparently without entering into the circulation of the blood, by an unknown and even a much shorter course. Now, to the eye of the anatomist, there are no organs more distinct from each other; they not only lie far remote in situation, but even in different cavities, and are separated by a strong, stout membrane, called the peritoneum.

* Appendix to Travels, p. 301, 8vo. edition.

To determine whether such a channel actually existed or not, Dr. Wollaston introduced into the stomach three grains and a half of the salt called prussiate of potash; the presence of which, in almost all kinds of colourless fluids, is capable of detection to the utmost nicety, by mixing with them a small portion of solution of iron, the colourless compound being immediately marked with a blue tinge. The above quantity was given to a healthy person, about thirty-four years of age, and was repeated every hour to the third time. The natural secretion from the kidneys being tested every half hour, was found in two hours to be slightly dyed, and at the end of four hours to afford a deep blue. At this period, just one hour after taking the last dose, and when the blood-vessels might be supposed to be fully impregnated with the material, if it passed to the kidneys through this conveyance, blood was taken from the arm, and allowed to coagulate, so that the serum or limpid part of it might be fully separated. The presence of the prussiate was then endeavoured to be discovered, by means of the solution of iron, but without the least effect, for the serum still remained colourless. And in other experiments of a similar kind, made both by Dr. Wollaston and Dr. Marceet, it was satisfactorily ascertained that the prussiate of potash, though it found its way readily to the kidneys, did not exhibit any trace of its existence in the fluid of any other organ whatever, any more than in that of the blood; as the saliva, the mucus of the nostrils, or the limpid discharge produced by blisters. Mr. Home has since shown, that rhubarb introduced into the stomach in like manner finds a path to the kidneys, apparently without passing through the circulating system.*

Mr. Home at one time suspected that the organ of the spleen afforded a passage from the stomach to the circulation of the blood in the cases before us, instead of the lacteal vessels, which immediately rise from the alimentary canal. This idea, he has, however, since relinquished as erroneous; but had even such a passage existed, it would not have answered the purpose; for it would only have conducted materials by another path to the blood; and the experiments of Dr. Wollaston have sufficiently proved, that the unknown channel, wherever it lies, has no connexion whatever with any part of the system of blood-vessels, or even with the common system of absorbent vessels: and so far he seems to have disproved a previous theory of Mr. Charles Darwin upon this subject, which held, that the absorbent system might become the channel, by assuming a retrograde action. Such action, however, has never been established, and, independently of the experiments before us, it is rendered highly inconceivable by the known structure of the absorbent vessels themselves.

The corollary, then, resulting from these observations, is, that in the animal system, as well as in inorganic nature, bodies in various instances act where they are not, and through channels of influence or communication, with which we are altogether unacquainted.

The examples thus far offered, in regard to animals, I readily admit, are taken from different parts of the same individual frame: but as they are drawn from parts remotely situated, and whose intercourse, so far as we are able to trace it, is as much cut off as though they were of different frames, excepting, indeed, by a channel which does not show itself to be resorted to in the cases before us, I mean the blood; they may serve to lay a groundwork for our conceiving the possibility of a similar influence or association of action between different parts of different frames, or, which is the same thing, between living body and living body.

I proceed, then, to offer examples of this latter kind of influence. The subject, I am aware, is not only of a very curious, but of a very delicate nature,

* The only mode by which the present writer can conjecture the possibility of these substances being conveyed to the kidneys by the course of the blood, and becoming manifest in their ordinary secretion, on the application of chemical tests, is, that they may be so minutely decomposed by the action of the blood while passing through it, as to be beyond the influence of any tests whatever; and that they only discover themselves in the renal secretion, in consequence of a peculiar attraction or affinity of the organ for such materials, and their being hereby thrown off in a more concentrated form. But this explanation is, after all, merely conjectural.—See Study of Med. vol. v. p. 283, 2d edition.

and requires to be handled with the greatest dexterity; nor do I know of any philosophical work to which we can turn as a proper beacon to direct us in our pursuit, and to determine where the boundary of sober judgment ceases, and that of imagination begins.

Some of the instances I shall refer to may, perhaps, be denominated instinctive influences. I have no objection to the term; but the facts will remain as singular, and as little accounted for, as if no such term were in existence.

Among quadrupeds, and, so far as we know of them, among amphibials, fishes, and insects, there exists but little attachment of the male to the female during the time of parturition, or to his own young after the female has brought them forth. The seal-tribes, and especially those of the trichecus *Manatus*, or lamantin, from which we have probably derived all the idle stories of mermen and mermaids, together with a few others, may, perhaps, be offered as an exception; for these, and especially the lamantin, form unions of single male with single female that continue through life, and live in distinct families with their offspring, till the last, acquiring maturity, leave their paternal home, and found similar families for themselves. Such, then, being the general fact with regard to other animals, whence comes it to pass that the males among the bird-tribes should evince, with a few exceptions, an attachment that is so rarely to be met with elsewhere? What is that wonderful power that rivets the greater number of male birds to female birds during the time of nesting and incubation; that impels them to take an equal part in constructing the nest, and stimulates them with feelings unknown at any other season? Whence is it that several of them, as the male raven (*corvus Corax*), divide the toil and time of sitting, and incubate the eggs by day as the female does by night? or, that others of them, leaving to their respective females the entire process of incubation, sooth them through the whole of this tedious period, often extending to not less than six or eight weeks, with their melodies from a neighbouring bush, and supply them with food with the utmost tenderness and punctuality?

Whence is it, more especially amid birds that feed their young with a viscid chyle or milk, secreted at that peculiar period in the crop or craw, that the crop of the male becomes enlarged and changed in its action, in the very same manner as that of the female, so as to enable him to divide the tender office of nursing, and to supply the young with an equal quantity of nutriment? In the body of the mother we can, perhaps, trace a series of actions which, if they do not give us a full insight into the cause of such a change, and such an additional function, at least prepare us to contemplate it with less astonishment; it is a change, in a very considerable degree, analogous to what occurs in the female frame of most other kinds and classes when similarly situated; and which is evinced in its highest and most beautiful perfection in our own race. But in the production of a similar change in the crop of the male pigeon, we meet with a fact altogether anomalous and alone: there is no connexion of organ with organ; no perceptible chain of actions that can have given rise to it: the frames of the individuals are distinct. It is a pure sympathy excited in one being by a peculiar change produced in the organization of another, and leading to a similar change in the being that is thus most wonderfully and inexplicably operated upon.

Let us pass from the bird-tribes to fishes. There are various animals of this class that, on being touched, or even approached without being touched, are enabled to exhaust the irritable or sensorial power, or both together, of the hand or other limb that approaches them, so as to paralyze it and render it incapable of exertion. Such, especially, are those fishes which we denominate the torpedo-ray, and the electric eel or gymnote. Of these the former has been longest known to naturalists; for, in consequence of its being an inhabitant of the Mediterranean Sea, it is described both by Greek and Roman writers, who impute its distinctive faculty to magic; and conceive that the animal has a power, not only of concentrating this magical energy at option, but if seized hold of by a fishing-hook, of impelling it through the whole

length of the hook, line, and rod, to the arm of the angler, and hence by palsyng his arm, of effecting his escape. So Oppian in Greek verses, which I will take leave thus to translate:—

The hook'd torpedo, with instinctive force
Calls all his magic from its secret source;
And through the hook, the line, the taper pole,
Throws to th'offending arm his stern control.
The palsied fisherman, in dumb surprise,
Feels through his frame the chilling vapours rise,
Drops the vain rod, and seems, in stiffening pain,
Some frost-fix'd wanderer o'er the icy plain.*

There may, perhaps, be some exaggeration in this description; but there are not wanting naturalists of modern times who contend that the torpedo is able to throw his benumbing influence to this extent and in this manner. This influence, moreover, is altogether voluntary; and hence the animal will sometimes allow himself to be touched without exerting it. He occasionally loiters on the moist sands of the shore after the tide has retreated, burying himself under the sand by a brisk flapping of his fins, which serves to fling this material over him; and in this state he is said to inflict at times, even through the sand that covers him, a torpor so severe as to throw down the astonished passenger that is inadvertently walking over it.

We now know something of the medium through which this animal operates, and have no difficulty in referring it to an electric or Voltaic aura, and can even trace a kind of Voltaic apparatus in its structure. Yet, before the laws or power of electricity or Voltaism were known, and, consequently, before the medium by which they act was followed up, which to this hour, however, is only known by its results (for it has never been detected as an object of sense), it is not to be wondered at that so mysterious an energy, operating or ceasing to operate at the option of the animal, and occasionally operating at a distance from the individual affected, should be regarded as a species of magic or incantation.

The Voltaic power of the electric eel or gymnote, is, however, more obvious and effective than that of the torpedo: the gymnote making a sudden and concentrated assault by shocks, of less or greater violence, as though from a more highly-charged battery; and the torpedo, by a numbness or torpor, whence, indeed, its name, produced by small but incessant vibrations of Voltaism, seldom, excepting in severe cases, amounting to the aggregation of shocks, and precisely similar to what is felt in a limb upon applying to it a great multitude of weak strokes, rapidly repeated from a small battery or Leyden phial. Yet even the peculiar properties of the gymnote were received with the greatest skepticism for nearly a century after their first discovery; which, as this fish is almost exclusively a native of the warmer seas and rivers of Africa and America, did not take place till the middle of the seventeenth century. They were first pointed out to the French Academy in 1671, by M. Richer, one of the travelling professors sent out by the Academy to conduct certain mathematical observations in Cayenne; but were not generally credited till the concurrent experiments of M. Condamine, Mr. Ingram, Mr. Gravesend, and other celebrated natural historians, set every doubt at rest, about a century afterward.

The more formidable power of the electric gymnote enables it, upon the authority of almost every experimenter, to give not only severe shocks, both in the water and out of the water, when in actual contact with another animal, but to convey them, as we have just observed that the torpedo is said to do, though upon doubtful testimony, through long rods or poles. It is highly probable, however, that such poles must first be wetted with water; for both the gymnote and the torpedo are found to be limited to precisely the same conducting and non-conducting mediums as are met with in common electricity.

In these cases we trace something of the medium by which the irritable or

* Alient. i. 412.

sensorial power is exhausted. There are various other cases, however, in which, to this moment, we are as ignorant, and as little capable of tracing it, as mankind must have been in regard to the animals before us, antecedently to a discovery of the electric aura. And I here particularly allude to the torpid effects produced upon poisonous serpents and scorpions in Africa and America, on their being handled by persons of two different descriptions; the one possessing this torpifying power naturally and hereditarily, and the other acquiring it by artificial preparation; such as chewing the roots or other parts of certain plants, rubbing them in their hands, or bathing the body in aqueous infusions of them, and thus impregnating the body of the operator with their virtues.

There appears to be no country in the world so much infested with serpents of this kind as the ancient Cyrenaica, or that part of Africa which lies northward of the great desert of Sahara. Among the different tribes that formerly inhabited this region, one of the most celebrated was the Psylli; and as this tribe seems to have been in full possession of this power, either from art or nature, and to have given the strongest and most extraordinary proofs of its having possessed it, all persons capable of exerting a similar effect were denominated Psylli by the Greek and Roman writers. And hence Plutarch tells us, that when Cato pursued his march through the Cyrenaic desert in search of Juba, he took with him a variety of these Psylli to suck out the poison from the wounds of such of his soldiers as should be bitten by the numerous serpents of the country.

It appears most probable that the Psylli were not naturally protected against this venom, but from long and skilful practice were acquainted with the virtue of those plants which, as I have just hinted, answer both as a preservative against the bite, and as an antidote after the bite has been inflicted: and, being strongly addicted to divination or pretended magic, as all the historians who have given us any account of them affirm them to have been, affected to derive their power of subduing poison from this preternatural source alone, and inculcated the belief that they could only exercise it, by muttering or chanting some potent verse or spell over the person who was affected. And hence the disarming a serpent of his capacity of poisoning, or disarming the poison itself of its deadly effect after a wound had been received, was denominated charming or incantation. So Silius Italicus,* in allusion to the Psylli, or their neighbours, the Marmarides, lib. iii.:

Ad quorum CANTUS mites jacuere Cerastes.
The horned snake lies harmless at their song.

This sort of power, derived from art or nature, and probably originating in this quarter of the world, appears to have been known in the remotest ages, and to have been uniformly ascribed to the same influence of certain magical words or verses chanted, or uttered in recitative; and it appears also to have been very generally conjectured, that there exists some kinds or species of poisonous serpents that are capable of shutting their ears against the sounds thus uttered, and that will not hearken to or be charmed by the voice of the enchanter, however skilful the enchantment.

The sacred books abound in allusions to this popular tradition;† they are equally to be met with in the writings of the Greek and Roman poets, and even in the Sanscrit moralists, as, for example, in the Hitopadesa of Vishnu-sarman, probably of a higher antiquity than the Psalmist himself, who tells us in his book of aphorisms, that “as a charmer draweth a serpent from his hole, so a good wife, taking her husband from his place of torture, enjoyeth happiness with him.”‡

* See also Virgil, Æn. vii. 753, in which he ascribes the salutiferous power both to the song and touch of the enchanter.

Vipereo generi, et graviter spirantibus hydriis
Spargere quæ somnos CANTUQUE MANUQUE solebat,
Mulcebat, que iras, et morsus arte levabat.

† Ps. lviii. 5, as also Jer. viii. 17, Deut. xviii. 11.

‡ Transl. of Sir William Jones.

There are some philosophers and historians, who have ventured to disbelieve that any such extraordinary power has ever been possessed by any people. The very cautious writers of the Ancient Universal History express no small degree of skepticism upon this point: * and M. Denon, one of the chief of the literati that accompanied Buonaparte to Egypt, has been bold enough to laugh at the assertion, and to regard every pretension to such a power as a direct imposture. He offers, however, no sufficient ground for his ridicule, and is flatly contradicted by the concurrent testimony of all the best travelers, both to Africa and South America. Mr. Bruce is very full and very explicit upon the subject. He distinctly states, from minute personal observation, that "all the blacks in the kingdom of Sennaar, whether Funge or Nuba, are perfectly armed (*by nature*) against the bite of either scorpion or viper. They take the cerastes (or horned serpent, being the most common, and one of the most fatal of all the viper tribes) in their hands at all times, put them in their bosoms, and throw them to one another, as children do apples or balls; † during which sport the serpents are seldom irritated to bite, and when they do bite, no mischief ensues from the wound. The Arabs of the same country, however, he tells us as distinctly, have not this protection naturally; but from their infancy they acquire an exemption from the mortal consequences attending the bite of these animals, by chewing a particular root, and washing themselves with an infusion of particular plants in water.

The Nuba and Funge, however, or those who are preserved naturally from the bite and venom of the viper and scorpion, are also highly skilful in the knowledge and application of these roots, and other parts of plants, to those who have no natural protection or charm. Mr. Bruce has given a particular account of several of these plants, some of which seem only capable of acting against the power of the serpent, others only against that of the scorpion, and a third sort against both. And in either instance, where they secure against the bite or sting, and thus operate as a preventive or prophylactic, they also secure equally against the poison, when introduced into the system by a wound, and thus operate as an antidote.

In South America the natural charm does not seem to be possessed by any tribe: but the artificial charm, obtained by the use of peculiar plants, is known as extensively, and employed as successfully, as in Africa, and is found to possess the same double virtue of an antidote and a preventive. One of the most satisfactory accounts of this singular fact is contained in a memoir drawn up, in 1791, by Don Pedro d'Orbieres y Vargas, a native of Santa Fe, which details a long and accurate list of experiments which he instituted to ascertain it. The plant chiefly employed by the American Indians, he tells us, is denominated in that part of the world *vejuco de guaco*, guaco-withey, from their having first observed that the bird of this name, or, as Catesby calls it, the serpent-hawk, usually sucks it before it attacks poisonous serpents, and then attacks them without mischief. ‡ Prepared by drinking a small portion of the juice of this plant, and inoculating themselves with it also, by rubbing it upon three small punctures in the hands, breast, and feet, and thus impregnating the body with its virtues, Don Pedro himself, and all his domestics, were accustomed to venture into the open fields, and fearlessly seize hold of the largest and most venomous serpents. It was scarcely ever that the animal thus charmed or fascinated had power to bite, and when he did so, the wound produced was slight and of no consequence. M. Acrell, in the *Amœnitates Academicæ*, after mentioning the same plant, tells us that the senega is possessed of a like power. §

Of the truth of the fact, therefore, thus confirmed by the most trusty travelers and historians, in different quarters of the world, there can be no doubt; and it adds to the facility of believing it to find that other animals besides men are possessed of a similar power. Thus the conder and the wild boar feed harmlessly on the rattlesnake, which appears to offer no resistance to

* Vol. iii. p. 491, Appendix.

† It appears to be the ophiorrhiza *Mungos* of Linnæus.

‡ *Amœn. Acad.* vol. vi. No. 112. *Morsura Serpentum*, 1762.

§ *Travels*, Appendix, p. 303.

their attack, and suffer no injury from its venom after they have satisfied their hunger. In both these cases, the charm or power of protection appears to be natural, as in the Nuba and Funge tribes of Africa. In the serpent-hawk or guaco, however, just noticed, which derives its chief food from poisonous snakes, and in the tantalus or ibis of Egypt, the numenius *Ibis* of Cuvier, which equally attacks and devours them, the charm or protection seems to be artificial, and to depend upon the virtue of the plant to which they have recourse for this purpose; for I have already observed that the serpent-hawk uniformly applies to the ophiorrhiza before he commences the battle; while the ibis, though he appears to open the fight without any such preparation, retires from the field, if wounded, to the plant which he knows will serve as an antidote, and immediately renews and continues it till he has vanquished his enemy.

The fact, then, being incontrovertible, we have next to inquire into the secret and invisible cause of so very salutiferous and extraordinary an effect; or rather, into the nature of the medium by which so extraordinary an effect is produced. That there is in all these cases a peculiar emanation issuing from the body of the protected, there is little doubt.

But we have no reason for ascribing it to electricity or Voltism, since the persons thus peculiarly endowed, whether by art or nature, whether temporarily or permanently, exhibit no proofs of an electric power upon any other animal, or of the same power, whatever it may be, in any other way. It appears, nevertheless, to be a power that operates in a manner somewhat similar to, but in some respects more forcible and more general, than that of electricity: I mean by exhausting equally and altogether the muscular and sensorial energy of the serpent or scorpion to which it is applied; for, in regard to the serpent kinds, we are told distinctly, as well in America as in Africa, that they remain totally torpid and inactive beneath its influence; scarcely ever being able to muster up force enough to attempt any resistance, even when eaten up alive, as Bruce assures us he has seen them, from tail to head, like a carrot; * a fact which, doubtless, could never occur in animals so active and courageous, unless they were secretly deprived of all power of resistance.

We are not left, however, to mere conjecture upon this subject; for Mr. Bruce most positively affirms, that they constantly sicken the moment they are laid hold of, and that they are sometimes so exhausted by this invisible power of fascination, as to perish as effectually, though not so rapidly, as though they had been exhausted by an electric battery, or a stroke of lightning: "I constantly observed," says he, "that however lively the viper was before, upon being seized by any of these barbarians, he seemed as if taken with *sickness and feebleness*, frequently shut his eyes, and never turned his mouth towards the arm of the person that held him." † And in another place, he as expressly asserts, that he has seen the animal die while under the stroke of this invisible influence.

We have here, then, an effect produced, and of the most powerful character, by one animal upon another, without our being in the least degree capable of tracing the medium of operation.

Whether in this case actual contact is absolutely necessary does not seem to have been ascertained or sufficiently attended to.

In the case of electric fishes, we have already seen it is not absolutely necessary; and in another phenomenon, perhaps of a still more extraordinary nature than any I have yet adverted to, it seems to be still less so, and, indeed, not at all necessary,—I mean the very curious fascinating power of the rattlesnake over various small animals, as birds, squirrels, and leverets, which, incapable of turning off their own eyes from those of the serpent-enthraller, and overpowered with terror and amazement, seem to struggle to get away, and yet progressively approach him, as though urged forward, or attracted by a power superior to that of natural instinct, till at length they enter apparently without any foreign force, into the serpent's mouth, which has all along been open to receive them, and are instantly devoured.

* *Travels*, &c. Appendix, p. 302.

† *Ib.* p. 303.