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A REMARKABLE BOOK ON THE HABITS OF ANIMALS.

The Naturalist in La Plata. By W. H. Hudson, C.Z.M.S. With Illustrations. (London: Chapman and Hall, Ltd., 1892.)

THIS volume deserved a more distinctive title, since it differs widely from the several works of other naturalists with which it may be classed judging from the title-page alone. It is, in fact, so far as the present writer knows, altogether unique among books on natural history. It is to be hoped that its success will be proportional to its merits, and that it will form the first of a series of volumes, by means of which residents in the various extra-European countries will make known to us the habits of the animals which surround them. What renders this work of such extreme value and interest is, that it is not written by a traveller or a mere temporary resident, but by one born in the country, to whom its various tribes of beasts, birds, and insects have been familiar from childhood; who is imbued with love and admiration for every form of life; and who for twenty years has observed carefully and recorded accurately everything of interest in the life-histories of the various species with which he has become acquainted. When we add to this the fact that the writer of this volume is well acquainted with the literature, both old and new, bearing upon his subject; that he groups his facts and observations so as to throw light on obscure problems, and often adduces evidence calculated to decide them; and, in addition to all this, that the book is written in an earnest spirit and in a clear and delightful style, it becomes evident that not all who attempt to follow in his steps can hope to equal their forerunner.

As every chapter of the book contains new and interesting matter, it is difficult to convey an adequate idea of it by partial extracts or by an enumeration of its chief topics; but the attempt must be made. The first chapter gives us a general sketch of the "Desert Pampas" and its forms of animal life. The viscacha, the coypu, and the tucu-tucu—three strange rodents—are brought vividly before us by a description of some of their more prominent habits; the edentate armadilloes appear in a new light, since one of them, the hairy armadillo, is shown to be a dominant species holding its own against enemies of higher type, so omnivorous that it can live on almost everything from grass to flesh, the latter either found dead and in all stages of decay or captured by means of its own strategy. It is so agile that it catches mice, so strong and well armed that it kills poisonous snakes, and having killed them cuts them in pieces and swallows as much as it needs. Mr. Hudson adds:—

"It is much hunted for its flesh, dogs being trained for the purpose; yet it actually becomes more abundant as population increases in any district; and, if versatility in habits or adaptiveness can be taken as a measure of intelligence, this poor armadillo, a survival of the past, so old on the earth as to have existed contemporaneously with the giant glyptodon, is the superior of the large-brained cats and canines."

Equally extraordinary are the still lower opossums, one of which is semi-aquatic and apparently adapted to its surroundings, while the other species (*Didelphys azaræ*) is in every way adapted to an arboreal life, yet it is everywhere found in this level treeless district, which leads to one of our author's suggestive remarks:—

"For how many thousands of years has this marsupia been a dweller on the plain, all its best faculties unexercised, its beautiful grasping hands pressed to the ground, and its prehensile tail dragged like an idle rope behind it! Yet, if one is brought to a tree, it will take to it as readily as a duck to water, or an armadillo to earth, climbing up the trunk and about the branches with a monkey-like agility. How reluctant Nature seems in some cases to undo her own work! How long she will allow a specialized organ, with the correlated instinct, to rest without use, yet ready to flash forth on the instant, bright and keen-edged, as in the ancient days of strife, ages past, before peace came to dwell on earth!"

But we must pass on from this mere preliminary chapter to more solid matter, only noting that we have a vivid sketch of the great rhea or American ostrich, of the flamingo, the swans, and the noble crested screamer, all of which are being exterminated by increasing population and improved weapons; and this leads to a noble protest against this extermination, of which we can only quote the concluding words:—

"Only when this sporting rage has spent itself, when there are no longer any animals of the larger kinds remaining, the loss we are now inflicting on this our heritage, in which we have a life-interest only, will be rightly appreciated. It is hardly to be supposed or hoped that posterity will feel satisfied with our monographs of extinct species, and the few crumbling bones and faded feathers which may possibly survive half-a-dozen centuries in some happily-placed Museum. On the contrary, such dreary mementoes will only serve to remind them of their loss; and if they remember us at all, it will only be to hate our memory, and our age—this enlightened, scientific, humanitarian age, which should have for its motto, 'Let us slay all noble and beautiful things, for to-morrow we die.'"

A chapter devoted to the puma is full of new and interesting matter. This animal ranges from British Columbia to the Straits of Magellan, but throughout this vast region there seems to be no authentic record of its ever attacking men except in self-defence. This has led to its being thought to be cowardly, whereas it is one of the bravest of the feline race, since it constantly attacks and conquers the jaguar whenever the two inhabit the same district, while in North California it is the enemy of the grizzly bear, and is again always the victor. In the Pampas, where it is common, the fact that it never attacks man, in however helpless a position he may be, is so well known, that the Gaucho confidently sleeps on the ground, although he knows that pumas are close by; while it is said that a child may sleep on the plain unprotected in equal security. Many curious anecdotes are given in illustration of this remarkable trait of so powerful and, as regards all other large Mammalia, bloodthirsty a creature. And the curious thing is that it seems to be no dread or dislike of man that leads to the peculiarity, but rather some strange feeling of affection, or sense of pleasure in man's vicinity, shown in many curious ways, which has led the Pampas-dwelling Gauchos to call it "the friend of man."

In the next chapter, entitled "A Wave of Life," we have a far broader subject touched upon and illustrated by a mass of curious observations. The interdependence and complex relations of species, so admirably portrayed by Darwin, are here brought vividly before us. We are told how, during a fine moist summer, when grass and flowers were abundant, mice increased to an abnormal extent, so that everywhere in the fields it was difficult to avoid treading on them, while dozens could be shaken out of every hollow thistle-stalk lying on the ground. The most incongruous animals swarmed to the feast which they provided. Dogs lived almost entirely on them, as did the domestic fowls, assuming the habits of rapacious birds. The cats all left the houses to live in the fields. Tyrant-birds and cuckoos seemed to prey on nothing else. Foxes, weasels, and opossums fared sumptuously, and even the common armadillo turned mouser with great success. Storks and short-eared owls gathered to the feast, so that fifty of the latter birds could often be seen at once, and they got fat and bred in the middle of winter, quite out of their proper season, in consequence. The following winter was a time of drought, the grass and herbage had all been consumed or was burnt up, and the mice, having no shelter, and being obliged to search for food, soon fell a prey to their numerous enemies, and were almost wholly exterminated. Their vast increase, by bringing together innumerable enemies, was the cause of their succeeding decrease. As Mr. Hudson well remarks:—

"Here, scene after scene in one of Nature's silent, passionless tragedies opens before us, countless myriads of highly-organized beings rising into existence only to perish almost immediately, scarcely a hard-pressed remnant remaining after the great reaction to continue the species."

We cannot stop to notice a tithe of the curiosities of natural history with which this volume abounds, such as the poisonous toad which kills horses, and the wrestler frog, which gives a sudden pinch to an enemy with its muscular fore-legs, and then escapes; the huge venomous man-chasing spider, a species of Lycosa, which actually pursues men on foot and on horseback; the strange dread which gnats, mosquitoes, and sand-flies have of dragon-flies, so that a single individual of the latter insect will cause clouds of the tormentors instantly to disappear; the interesting discussion on parasite problems, and the wonderful storms of dragon-flies which *precede* wind-storms from the interior; the new and interesting cases of mimicry and of warning colours; and the delightful chapter on the crested screamer, the author's prime favourite among all the denizens of the Pampas, which, though possessing a body as large as that of a swan, yet soars up into the air like a lark, and in flocks of thousands, when so high as to appear only specks in the blue sky, pours forth its song in silvery sounds delightful to listen to. These and many other matters of interest must be studied in the book itself, since we must devote the remainder of our limited space to some valuable observations and discussions on certain instincts, by which new light is thrown on several disputed questions.

The chapter on "Fear in Birds" is especially interesting, since the result of the author's observations is opposed to the view held by Darwin and Herbert Spencer as to their instinctive fear of man or birds of prey antecedent to experience or parental teaching. The one thing that is instinctive is the alarm caused by the warning note of the parent. This produces an effect even before the chick is hatched, for, in three different species belonging to widely separated orders, Mr. Hudson has watched the nest while a young bird was chipping its way out of the egg and uttering its feeble *peep*, when, on hearing the warning cry of the mother-bird, both sounds instantly cease, and the chick remains quiescent in the shell for a long time, or till the parent's changed note shows that the danger is over. Young nestling birds take their food as readily from man as from their parents, till they hear the warning cry, when they immediately close their mouths, and crouch down frightened in the nest. Parasitical birds which do not recognize the warning cries of their foster-parents show no fear. The young parasitical cow-bird takes food from man, and exhibits no fear although the foster-parents are hovering close by screaming their alarm notes. So, a young wild dove, reared from the egg by domestic pigeons which, never being fed, were half wild in their habits, never acquired the wildness of its foster-parents, but became perfectly tame and showed no more fear of a man than of a horse. He had none of his own kind to learn from, and did not understand either the voices or the actions of the dove-cot pigeons. Mr. Hudson has also reared plovers, tinamous, coots, and many other wild birds from eggs hatched by fowls, and found them all quite incapable of distinguishing friend from foe, while some, such as the rhea and the crested screamer, are much tamer when young than domestic chickens and ducklings.

Mr. Hudson concludes that birds learn to distinguish their enemies, first from parental warnings and later by personal experience, and he considers that this view is confirmed by the different behaviour of birds in the presence of various species of the hawk tribe, the amount of alarm shown being exactly proportionate to the degree of danger. Some hawks never attack birds, others only occasionally. The chimango kite is chiefly a carrion-feeder, and its presence excites no alarm among small birds. One of the harriers is so like the chimango in some states of plumage that the latter is sometimes mistaken for it, and a certain amount of fear is exhibited, which, however, soon passes away on discovering the real nature of the intruder. Buzzards are still more feared than harriers, as they are more destructive to birds, and they cause a somewhat greater amount of alarm. But most dangerous of all is the peregrine falcon, and, however high in the air this may be, the feathered world is thrown into the greatest commotion, all birds, from the smallest up to species as large as duck, ibis, and curlew, rushing about as if distracted. Even when the falcon has disappeared, the wave of terror excited by it subsides but slowly, and the birds continue for a considerable time to be wild and excited. Now, this nicely-measured alarm, proportioned to the danger to be apprehended from the different species, can hardly be due to inherited instinct, even if this could explain the general dread of raptorial birds; and, taken in connection with the numerous other facts in the habits of young birds, leads to the conclusion that fear of enemies is wholly the result of education and experience.

Perhaps the most interesting chapter in the whole volume, the fullest in new matter, and the most important in its bearing on a much-disputed theory, is that on "Music and Dancing in Nature." The result of Mr. Hudson's long-continued observations is that almost all mammals and birds have the habit of indulging occasionally in more or less regular performances, with or without sound, or composed of sound only, some being only discordant cries and choruses or uncouth irregular motions, while the more aërial, graceful, and melodious kinds exhibit more complex and more beautiful forms. It is among birds that this habit is most fully developed and presents itself in the most graceful or fantastic performances. Great numbers of birds of very different forms and habits—hawks, vultures, ibises, spoonbills, and gulls—circle about in the air, singly or in flocks, and apparently for the mere delight in aërial motion. Sometimes they rise to vast altitudes, and float about in the air in one spot for an hour or longer at a time, hundreds of birds gliding in and out among each other with perfect precision as in a set dance. Ibises and ducks have special performances of their own, but perhaps the most curious are those of some species of rails. The ypecaha rails have meeting-places on smooth level ground near the water and well surrounded by dense beds of rushes. One bird sounds a note of invitation; others from all sides come hurriedly to the place, where they begin a strange screaming concert, rushing about all the time. The cries they utter somewhat resemble human screams of terror, frenzy, or despair, mingled with half-smothered cries of pain and moans of anguish. This exhibition lasts a few minutes, after which the assembly peacefully breaks up.

The singular wattled, wing-spurred, and long-toed jacanas have a different kind of meeting. They usually go singly or in pairs; but occasionally, in response to a call by one of them, all who are within hearing leave off feeding and fly to one spot, where they walk about with their beautiful wings erect or half open, or waved up and down with a slow and measured motion. With these two species both sexes join in the display; but that of the spur-winged lapwing is altogether peculiar, inasmuch as it takes place with three individuals only. These birds live in pairs, and at intervals during the day or on moonlight nights, one bird will leave his mate and fly to another pair a short distance off. These will receive the visitor with signs of pleasure. First going to meet him, they place themselves behind him, and all three march rapidly, uttering special notes. Then they stop; the leader stands erect with elevated wings uttering loud notes, while the other two, with puffed-out plumage, standing side by side, stoop forward till the tips of their beaks touch the ground, and with a low murmuring sound remain for some moments in this strange posture. Then the visitor goes back to his own ground and mate, and later on they receive a visitor, whom they treat in the same ceremonious fashion They are said to be so fond of this form of visiting that they indulge in it all the year round, and the illustration representing it is a most curious and fantastic picture of bird life.

A considerable number of Passerine birds also have curious displays, which are here described, as well as songs of a most remarkable character. Some sing alone, others in concert; in most instances the voice is at its best during the mating period, but in one of the smaller finches the song is at that time feeble, while at a later period it becomes far more powerful and melodious. There is one species, the white-banded mocking-bird, which is considered to exceed all other songsters in the copiousness, variety, and brilliant character of its music. By the half-hour it will first imitate with great accuracy the songs of many other species—a strange and beautiful performance; but this is merely the prelude to its own song, which is "uttered with a power, abandon, and joyousness resembling, but greatly exceeding, that of the skylark singing 'at Heaven's gate'; the note issuing in a continuous torrent; the voice so brilliant and infinitely varied that, if rivalry and emulation have as large a place in feathered breasts as some imagine, all that hear this surpassing melody might well languish ever after in silent despair."

Mr. Hudson's conclusion as to the meaning of the various actions and vocal performances that he describes, and of which only a few cases have been here referred to, is as follows:—

"I wish now to put this question: What relation that we can see or imagine to the passion of love and the business of courtship have these dancing and vocal performances in nine cases out of ten? In such cases, for instance, as that of the scissors-tail tyrant-bird, and its pyrotechnic evening displays, when a number of couples leave their nests, containing eggs and young, to join in a wild aërial dance; the mad exhibitions of ypecahas and ibises, and the jacanas' beautiful display of grouped wings; the triplet dances of the spur-winged lapwing, to perform which two birds already mated are compelled to call in a third bird to complete the set; the harmonious duets of the oven-birds, and the duets and choruses of nearly all the wood-hewers, and the wing-slapping aërial displays of the whistling widgeons; will it be seriously contended that the female of this species makes choice of the male able to administer the most vigorous and artistic slaps? . . . There are many species in which the male, singly or with others, practises antics or sings during the love-season before the female; and when all such cases, or rather those which are most striking and *bizarre*, are brought together, and when it is gratuitously asserted that the females *do* choose the males that show off in the best manner or that sing best, a case for sexual selection seems to be made out. How unfair the argument is, based on these carefully selected cases gathered from all regions of the globe, and often not properly reported, is seen when we turn from the book to Nature, and closely consider the habits and actions of all the species inhabiting any one district. We see then that such cases as those described and made so much of in the 'Descent of Man,' and cases like those mentioned in this chapter, are not essentially different in character, but are manifestations of one instinct, which appears to be almost universal among the higher animals. The explanation I have to offer lies very much on the surface. . . . We see that the inferior animals, when the conditions of life are favourable, are subject to periodical fits of gladness, affecting them powerfully, and standing out in vivid contrast to their ordinary temper. And we know what this feeling is—this periodic intense elation which even civilized man occasionally experiences when in perfect health, more especially when young. There are moments when he is mad with joy, when he cannot keep still, when his impulse is to sing and shout aloud and laugh at nothing, to run and leap and exert himself in some extravagant way."

And after showing how this impulse of joy is manifested in different animals according to their peculiarities of structure and habit, and after giving a number of other illustrative cases, he thus concludes:—

"I am convinced that any student of the subject who will cast aside his books, and go directly to Nature to note the actions of animals for himself—actions which, in many cases, appear to lose all significance when set down in writing—the result of such independent investigation will be a conviction that conscious sexual selection on the part of the female is not the cause of music and dancing performances in birds, nor of the brighter colours and ornaments that distinguish the male."

Other chapters of almost equal interest are those on the habit of the huanaco to go to certain places to die, and on the strange instincts of cattle, such as the excitement caused by the sight and smell of blood, that produced by scarlet clothing, and the persecution of the sick and weakly of the herd. These subjects are discussed with a fulness and originality the result of long personal observation, and will command the careful attention of those who are interested in the mental phenomena presented by animals. It remains only to add that the book is beautifully got up, that the text is singularly free from misprints, and that the numerous illustrations—photographic reproductions of drawings—are at once delicate and characteristic. Never has the present writer derived so much pleasure and instruction from a book on the habits and instincts of animals. He feels sure that it will long continue to be a storehouse of facts and observations of the greatest value to the philosophical naturalist, while to the general reader it will rank as the most interesting and delightful of modern books on natural history. ALFRED R. WALLACE.

THE PREVENTION OF INFLUENZA.

A Study of Influenza, and the Laws of England concerning Infectious Diseases, &c. By Richard Sisley, M.D.Lond., M.R.C.P.Lond. (London: Longmans, Green, and Co., 1892.)

UNDER the above title Dr. Sisley has collected papers read by him during the past twelve months before the Society of Medical Officers of Health, the Epidemiological Society, and the Congress of Hygiene. To these are appended extracts from the different Acts bearing on infectious disease, the provisional memorandum on epidemic influenza just issued by the Local Government Board, and sundry other matters connected with the subject. The work makes no pretence to be a study of influenza from the clinical or pathological standpoint; it deals simply with the prevention of the disease in epidemic form, and the legal machinery at our command for that purpose.

It may, at first sight, seem strange that, when, during the latter part of 1889, we watched the epidemic wave sweeping gradually over Europe towards our own shores, no one dreamed of taking any action with a view to staying the plague. But we must remember that it was a disease new to the modern generation of physicians—a disease with which the sanitary science of the present day had never had to cope—a disease whose cause was wholly unknown, and whose infectious character was imperfectly recognized, or even denied. Two years and more under the yoke have given only too abundant opportunity to investigate it from every point of view, and it is not too much to say that the Local Government Board Report by Dr. Parsons, issued last year, contains the most admirable and exhaustive study of influenza which has appeared in any European language. Yet the actual nature of the virus remains still an only partially solved problem: bacteriological research points to a definite bacillus as the probable organism, but till its natural history has been more thoroughly worked out, we must be content to fight the foe in the dark.

Dr. Sisley has not reprinted his papers in chronological order, though it is convenient to consider them thus. In that read before the Epidemiological Society in May 1891, he treats of the spread of influenza by contagion, strongly advocating the view that this is the most important factor in the diffusion of the disease. He bases his belief on very conclusive grounds, and few will now be found to disagree with him. Dr. Parsons's Report, appearing some time after this paper was read, has so abundantly confirmed the opinion, that it may be trusted that, whatever part seasonal and climatic influences may play as favouring causes, "telluric" theories have had their day. The disease is, in fact, an acute specific fever infectious in a somewhat high degree, and, in virtue of its short incubation period, diffusing itself with unusual rapidity.

Only an abstract is given of the paper read by Dr. Sisley before the International Congress of Hygiene last August. It deals with the prevention of the spread of epidemic influenza, and advocates general hygienic measures, the possible employment of prophylactics, and especially the avoidance of infection.

The essence of the book lies, however, in the paper read before the Society of Medical Officers of Health in January of the present year. Here Dr. Sisley discusses the application to influenza of the existing sanitary laws of England, and it cannot be said that his conclusions are of a very reassuring character. It is instructive to observe that the difficulty lies in this—that nobody knows whether influenza is a "dangerous infectious disease" within the meaning of the Acts, or not. Common-sense might have supposed that a disease which the Registrar-General declares to have been directly or indirectly responsible for some 27,000 deaths in England and Wales in a single year, would not inaptly be described as dangerous; but the point has not as yet been settled in a court of law, and it is possible that legal opinion might take a contrary view. Should its dangerous character be upheld by law as well as medicine, the provinces have at least the Public Health Act of 1875 to fall back on, and can thus enforce isolation of early cases. London, under its new Act, is apparently helpless; and, as it would take twelve days to add influenza to the list of notifiable diseases, it is clearly unwise to wait for a fresh outbreak before taking such a step, if it be determined to take it at all. It cannot be doubted that efficient isolation of early cases would be the most important method of averting an epidemic; the difficulty lies in a matter which Dr. Sisley has not dealt with—namely, the diagnosis of such cases. Medical men now recognize as slight instances of epidemic influenza cases which in non-epidemic times would be passed over as