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HOUZEAU ON THE FACULTIES OF MAN
AND ANIMALS

Etudes sur les Facultés Mentales des Animaux comparées à celles de l'Homme. Par J. C. Houzeau, Membre de l'Académie de Belgique. 2 vols. pp. 1,008. (Paris: Hachette, 1872. London: Williams and Norgate.)

IF this work had appeared a few years ago it would have created for its author a considerable reputation. Even now, had it been written in Europe after a careful study of all the best authorities on the subject, it might have been made a very valuable and important treatise. But its author tells us—and the fact is clearly reflected in its pages—that it has been mainly written during a residence in the less cultivated parts of America, without the means of consulting the more recent works on the various subjects of which it treats. It is true that M. Houzeau is a close and acute observer of the habits of animals, and he has furnished us with many curious and original facts; but his own observations and experiments are so overlaid by vast masses of less trustworthy and often irrelevant matter, and are so widely scattered owing to his elaborate classification and minute sub-division of the subject, that they lose much of their force and impressiveness.

For a work written under the circumstances here stated, it is far too large and too pretentious. It aims at an exhaustive treatment of the whole series of the actions and passions of animals and of man, as illustrating their comparative mental nature. It treats in detail of each sense, each habit, each instinct, each custom, passion, and idea; and it discusses so fully the phenomena of language and society that the title should have been reversed, it being really a study of the mental faculties of Man as compared with those of Animals.

The subject of inquiry, as stated by the author, is, "whether the mental faculties of man, of which our arts, sciences, and social state are the product, have not their germs in the lower animals; whether the several parts of our intellectual and moral nature do not insensibly and successively appear in the series of the animal kingdom." He assures us that he approached this inquiry with no preconceived ideas; but we may be permitted to doubt this when we find him bringing in such forced resemblances, as the rolling of pachyderms in mud with the practice of tattooing (vol. i. p. 343), that of ruminants rubbing off their hair to the shaving of men (i. p. 348), and the existence of neuter insects with the custom of castration (i. 351). These and many other similar cases show a determination to find some point of comparison of animals with man, which diminishes the effect of the numerous real and very curious resemblances he has undoubtedly brought forward. In his chapter on the question, whether the power of animals to find their way for great distances depends on a special sense, our author comes to a conclusion which, although we believe it to be a sound one, is opposed to the facts which he adduces. He believes, for instance, that pigeons traverse an unknown country in a direct line, and that dogs and other animals

find their way, in cases where neither sight nor smell could guide them. But he shows by many minute observations that animals, in ordinary cases, find their way by means of the same faculties which man employs to find his way, and hence he concludes that they do so in all cases. But this by no means explains the more extraordinary facts he has first adduced. Here we have an example of his deficiency of information. He quotes the case of the pigeons used during the siege of Paris, and evidently believes that all that was done was to take a carrier-pigeon from any part of France to Paris, when, on being let loose, the bird would infallibly return straight to its former abode. He apparently knows nothing of the fact that these birds must all be trained by means of wider and wider flights over the very country they are to traverse; and that without this precaution, a pigeon, taken by a circuitous route from Brussels or from Bordeaux to Paris, would no more find its way back to those places than would a deaf and dumb man under the same conditions.

In the chapter on the "instinct to use clothing," we have another example of our author's want of rigid impartiality. He endeavours to show that some animals use clothing, and that some men do not, and that it is, therefore, no distinctive character of man. His examples of dressed animals are hermit crabs and the larvæ of *Phryganea* and *Linea*; and although he adduces instances of unclothed men, he has in no way accounted for that sense of shame which he maintains is not innate, and which yet has, even more than the necessity for warmth, led to the practice of clothing among so many peoples.

In the section on the Sentiments and Passions, we have an elaborate account of the wars, massacres, and cruelties, tortures and human sacrifices, among the various races of men, and we find the characteristic remark, that "the touching custom of preserving a loved one's hair is, perhaps, only a transformation of the old practice of scalping." We commend this notion to Mr. Tylor, as the *ne plus ultra* of survival of savage practices in our modern civilisation. We have also a condensed account of the tortures inflicted on their prisoners by the North American Indians, which can hardly be surpassed for terrible descriptive power; but there is no attempt to find parallels to these essentially human attributes among the lower animals.

Although our author has devoted many pages to a discussion of the principles on which evidence is to be admitted, and has laid down some excellent rules on this subject, he appears to pay little regard to them in his own work. He asserts, for instance, without any reservation, that "a large number of species of apes have a laugh altogether analogous to ours;" but the only evidence he gives of the fact is that "Turks compare Europeans to apes, because they laugh like them;" the grin of anger being here confounded with the laugh of appreciative wit. In like manner he accepts as an undoubted fact the existence of people to whom the use of fire was wholly unknown, although the two cases he gives—the Guanches of Teneriffe, and the Marianne Islanders—are highly suspicious, and have both been shown by Mr. Tylor (in his "Early History of Mankind," a book quoted by M. Houzeau) to be contradicted by many facts, and to rest on no sufficient authority.

It is in Section V., on "Ideas," that we find some of the most curious observations and suggestive remarks to be met with in the whole work. Animals we know, go mad, and they also vary in their mental capacities, but we do not remember any case of idiocy having been recorded among the lower animals. M. Houzeau, however, tells us he had an idiotic dog, which could not take care of itself, and which behaved in an altogether strange and silly manner. But the most curious thing was that its mother observed its mental incapacity, and acted accordingly. From the time when she ceased suckling it, she took great pains to provide its food, bringing it dead birds or pieces of meat, "which she had never done, even for a single day, with any of her other puppies." From this observation, and the well-known fact that animals of the same species differ greatly in their capacity to receive instruction, our author is convinced that it is only through want of observation that we do not meet with mental derangements of various kinds and degrees among our domesticated animals. The faculties of attention, observation, and imitation, exist in a high degree among most of the higher animals; and when we add to these a very retentive memory, and a certain amount of direct and voluntary instruction which parents give to their young, much may be accounted for which has been imputed to those unknown faculties which are termed instinct. Not only does M. Houzeau maintain that the higher animals constantly act by means of intellectual processes altogether comparable to our own, but he extends this view to insects. A German naturalist, Gleditsch, relates that he one day spitted a toad on a stick, which he fixed upright in the ground. A number of burying beetles (*Necrophorus vespillo*) came around it; but as they could do nothing with the toad while in the air, they mined under the base of the stick till it fell, and then buried toad and stick together. The circumstances were quite abnormal for the *Necrophori*, and they acted exactly as an intelligent and reasoning creature would do. Again, when Pierre Huber placed some humble bees (*Bombus terrestris*) under a glass with a piece of comb so irregular that it would not stand firm on its base, they at once set intelligently to work to make it secure, some holding it up while others built walls and buttresses to make all solid. So, again, when the wasp observed by Erasmus Darwin, which could not carry away a large dead fly because the wind caught the wings, cut them off, and was then able to carry away its prey, it acted exactly as an intelligent and reasoning human being would act. As our author well remarks, whenever such facts are brought forward, the usual cry is—"What an admirable instinct!" but instead of having recourse to so miraculous a faculty, able to deal with phenomena occurring perhaps for the first time in the experience of the race, would it not be more simple to suppose these creatures to possess some small portion of our faculties of observation, of memory, and reflection? The following remarks on concluding the whole subject of instinct are well worthy of attention.

"It seems difficult to regard as the effects of a blind instinct such actions as spreading out damp grain in the open air to dry, and taking care of the eggs and the young of captive Aphides. It is difficult to conceive a being performing acts so varied and complex, and so bound one to the other in a connected series of labours, without any

perception of the bond of cause and effect which unites them. Animals perform automatically only simple actions depending on their immediate wants. But when the end requires a large number of preliminary and intermediate operations, of a varied character and dependent one upon the other, can we still suppose the entire line of action to be followed out in ignorance and obscurity?" And, after stating the fact of the burying beetles, who, after laying their eggs in the bodies of small dead animals, bury them in order that they may not be devoured by birds and beasts of prey, he continues:—

"If we pretend to see only instinct in this action of the insect, why should we have recourse to a different faculty when man buries his dead? Has not the act of burying for immediate end, in the one case as in the other, the securing the body from the attacks of carnivorous animals? Is there not at the same time, in both cases, a more remote end which forms the true motive of the act? The faculty of invention is doubtless more developed in man than in any species of animal; it is in him more powerful, more elevated, and often directed by nobler motives. But these differences of quantity and of nobility ought not to blind us to the existence of the faculty in various degrees of development among many animals" (ii. p. 236). Bearing also on this question, we have a curious discussion as to the power of animals to appreciate numbers. It is considered to be established that the magpie can count four, which probably refers to Leroy's experiment with crows (*NATURE*, iii. p. 183). The mule is supposed to be able to count as far as five at least, and this is considered to be established by the following observation. There is a short branch line of omnibuses in New Orleans, where each mule makes the journey five times successively before being changed. The veterinary surgeon of these animals called the author's attention to the fact that, whereas at the end of each of the first four journeys they are silent, as they approach the end of the fifth they neigh. But this does not seem satisfactory. The end of the fifth journey may well be determined by the estimation of mere distance, or of time, or by the sense of fatigue, or, what is still more likely, by some preparations for the change of mules which may be heard or smelt by those arriving. And this is rendered the more probable by an experiment tried by our author himself, showing that dogs cannot count even as far as two. For three successive weeks he repeated the same walk with his dogs on each alternate day; yet, although the dogs were always eager to go out when their master's preparations were seen, on the last trial, being the tenth repetition, none of them showed any knowledge that the day for an excursion had arrived. But neither is this quite satisfactory, as there is too long an interval between each trial, and it rather involves the recollection of a period of time than of a mere number. It can hardly, therefore, be held as proved that the lower animals have any sense of pure number.

Passing on to the consideration of moral and religious ideas, our author adduces the usual proofs that animals have a sense of right and wrong, but which really show nothing more than that they can be made to acquire certain habits through the fear of punishment or the expectation of reward. We next find the broad statement that the idea of duty is not universal among men, but no evidence is offered, except that no one act is held to be a

duty universally, or the contrary. But this is to misapprehend the real question, which is rather, whether there is any race of men among whom nothing is considered a duty. Is there any race with whom there are not certain acts which the majority do, or refrain from doing, independently of any fear of punishment, but because they believe them to be right or wrong? And is there, on the other hand, any race of animals whose actions are influenced in the same way? We think the answer to these questions would show a positive distinction between man and the lower animals, which distinction would hardly be lessened by maintaining that the idea of duty so defined is in savages only the fear of punishment by gods or demons, since it will not be maintained that the lower animals are ever influenced by such motives.

Passing over a curious chapter on the utilisation of the lower animals, chiefly by educating and making slaves of the anthropoid apes, we come to the subject of language, which is discussed in a manner which exhibits the author's defects and merits in a remarkable degree. He thinks it necessary to approach the subject by a discussion on the fables of speaking stones and plants, of the sounds emitted by nudibranch molluscs and fish, the hissing of serpents, and the croaking of toads. By interpreting the notes of certain birds into words, such as "Whip-poor-will," and a number of others, he arrives at the conclusion that some savage languages have fewer letter-sounds than have those of certain animals. The physiology of voice and the construction of speaking automatons is next sketched, before we come to the really valuable part of the chapter, in which the variety of sounds and calls of several species of animals are detailed, and it is thus shown that they possess a language of no contemptible extent. He also maintains that animals understand, or rather learn to understand, the language of very distinct species. His dogs, for instance, perfectly understood his poultry. Cocks and hens have one danger signal for the approach of a bird of prey, another for that of a terrestrial animal or for man. The latter would rouse the sleeping dogs, who would instantly rush out and bark, while they took no notice whatever of the former. This proves that fowls have a language capable of expressing slightly different but closely connected ideas, and also that dogs soon learn the languages of other animals.

The subject of Hereditary Transmission is very imperfectly treated. M. Houzeau is evidently unacquainted with Mr. Galton's researches, or he would not have arrived at the conclusion that "a more or less complete transmission of the physical type with independence more or less absolute of the intellectual and moral type,—such is the law of observation, the law of nature."

In his last lecture on "Sociability" the doctrine is boldly advocated that of all animals Ants approach nearest to man in their social condition. They represent semi-civilised societies; while the highest Apes only represent the lowest savage state. The varied modes of association among the lower animals and in the human race are detailed with great fulness, but with little influence on the general argument. On the question of the affiliation of races, we find some good remarks on the comparative value of the useful arts, the food plants and domesticated animals, as compared with customs and superstitions. The evidence afforded by the latter is, he

maintains, absolutely valueless unless supported by the former. In the concluding paragraphs of the work are some expressions and arguments which seem to show that the author is not an evolutionist, and has no clear ideas as to whether new species of animals are now coming into existence or not, or as to whether man has or has not originated from a lower animal form. This leads to an ambiguity and inconclusiveness in the whole work which contrasts strongly with the clear and definite views of such men as Darwin and Spencer, whose works lead us on by many and varied lines of research till they converge towards a grand and impressive conclusion. The present work cannot for a moment be compared with such as these; but it has special merits of its own, and it contains a mass of curious facts, acute observations, and sound reasoning, which fully entitle its author to take high rank among philosophical naturalists.

ALFRED R. WALLACE

GANOT'S NATURAL PHILOSOPHY

Popular Natural Philosophy. By Ganot. Translated by E. Atkinson, Ph.D. (Longmans and Co.)

THIS is a good elementary book, giving the first principles of the subjects with which it deals in a clear and concise manner, with very few unnecessary words. The work is not an abridgment of Ganot's "Elements of Physics," but is founded on Ganot's "Cours Élémentaire de Physique," of which it is not a mere translation; but additions and alterations have been made by Dr. Atkinson, with the view of rendering it more fit to serve the purpose for which it is designed, namely, to act as a "text-book of physics for the middle and upper classes of boys' and girls' schools, and as a familiar account of physical phenomena and laws for the general reader." The book is very well adapted for these purposes. It is entirely free of mathematical formulæ, which, though but sparsely used in Ganot's "Physics," are still an insuperable barrier to the use of some portions of that work by the non-mathematical reader. The subjects treated of are the same as those in Ganot's "Physics," namely—the properties of matter, hydrostatics, pneumatics, acoustics, heat, light, magnetism, and electricity. The treatment of these subjects is, however, not only more elementary but somewhat less comprehensive than in the larger book. The engravings of the instruments and of the experiments detailed are good and suggestive, and calculated to be of assistance not only to the learner but to the teacher. There is, however, a good deal of what is superfluous in a considerable number of the illustrations, and a few of the illustrations themselves are unnecessary. It is, perhaps, over-refinement of criticism to object to the superfluity of embellishment in Fig. 140, in illustration of a speaking tube. (By the way, how exceedingly small the fire is!) Fig. 139 seems quite unnecessary in explaining the experimental determination of the velocity of sound by the Bureau of Longitude of Paris.

Although, however, there may be a good deal of what is superfluous in the illustrations, there is nothing which is misleading; but, on the contrary, they are in all cases calculated to leave a correct impression of the point in question on the mind of the reader. Fig. 349, however,