JOURNAL OF

THE TRANSACTIONS

OF

The Victoria Institute,

OR

Philosophical Society of Great Britain.

EDITED BY THE HONORARY SECRETARY.

VOL. III.

LONDON:

(Published for the Institute)

ROBERT HARDWICKE, 192, PICCADILLY, W.

1869.

ORDINARY MEETING, MARCH 2ND, 1868.

THE REV. WALTER MITCHELL, M.A., VICE-PRESIDENT, IN THE CHAIR.

The Minutes of last Meeting were read and confirmed.

The names of the following new members were then announced, viz. :—

Rev. A. Hewlett, D.D. Oxon, Vicar of Astley, near Manchester; E. C. Gooddy, Esq., The Edge, near Meltham, Huddersfield; Wm. Mewburn, Esq., Wykham Park, Banbury.

It was also stated that the undermentioned book had been presented to the Library, viz. :—

The Authorship of the Practical Electric Telegraph of Great Britain. By the Rev. T. F. Cooke, M.A. *From the Author.*

The following Paper was then read by the Secretary :—

ON COMPARATIVE PSYCHOLOGY. By E. J. MORSHEAD, ESQ., *Hon. Foreign Sec., Vict. Inst.*

THERE is no doubt that man, as an animal, physiologically considered, is superior to the other members of the animal creation; but the superiority of his physical organization alone is not sufficient to justify us in assigning to him a separate place in Nature. He is subject to the same general laws; he is born; he develops into maturity; he eats, drinks, propagates his species, and dies; and so far he is nothing more or less than an animal.

Now all animals, man included, being subject to more or less similar conditions of nutrition, reproduction, &c., are more or less similar in structure, with such variations in the case of the lower animals as may suit them to fulfil the offices they have to discharge in the natural economy. The causes of sensation afforded by the world which they inhabit in common with ourselves being invariable, their organs of sensation are formed on the same principles as ours; having the same relation to space and matter, they are furnished with suitable organs of locomotion,—and so forth.

It therefore follows, necessarily, that, inasmuch as all animals—at least all vertebrate animals,—while resembling

each other in their general anatomical structure, differ considerably in detail; some of them approximate more closely to the human species than others. Consequently, many naturalists have arranged, or rather have endeavoured to arrange, the lower animals in a gradational series, according to the comparative resemblance of each species to man. Commencing with the anthropoid apes, they have carried this series through the entire brute creation, vertebrate and invertebrate; while some, passing the boundary which separates the animal from the vegetable kingdom, have placed its further extreme on the very confines of organic life. It is not my intention to discuss the anatomical differences between man and brute, but I would remark, in passing, that the theory of structural gradation appears to rest on a very slender foundation. The Quadrumana undoubtedly approach the human species more nearly than any of the other mammalia; but in what species of the mammalia are we to look for the next term of the series? If we remove the Quadrumana, we remove the keystone of the gradational system, and the rest is a dead level as far as regards the greater part of the mammalia; even the anthropoid apes do not approach man in single file.* Therefore, if the naturalist likes to amuse himself with the Chinese puzzle of arranging the lower animals in a graduated series, there is no great harm done; but the common-sense view of the matter is, that each class of animals having been created for the purpose of discharging special functions, the physical structure of each is regulated, not by the requirements of an imaginary system for which it is difficult even theoretically to assign a valid reason, but by the nature of the duties which each was intended to fulfil, as well as by the nature of the media in which each was intended to live.

This system, resting as it does upon the most insufficient and unsatisfactory evidence, has been made the basis of a still more aërial structure. The Gradationist having marshalled the various species of animated beings in an imposing series, with the anthropoid apes at one end—the other being far away amongst the zoophytes,—the matter is next taken in hand by a more advanced theorist. The Progressionist conceives this graduated series as manifesting evidences of development

* "This much is certain, that each of these anthropoid apes has its peculiar characters by which it approaches man; the chimpanzee, by the cranial and dental structure; the orang, by its cerebral structure; the gorilla, by the structure of the extremities. None of these stands next to man in all points,—the three forms approach man from different sides without reaching him."—Vogt, *Vorlesungen über den Menschen.*

analogous to those presented by an individual member of the animal kingdom in his progress from infancy to maturity. But, however attractive this theory may be as a hypothesis, there is not a single fact to support it *à posteriori*. In spite of all the ingenious reasoning which has been employed by the advocates of the progressive theory, the imposing procession obstinately refuses to move on. The gibbon never develops into an orang; the orang never becomes a chimpanzee; the chimpanzee is never transmuted into a gorilla; and there is no ground for supposing that the gorilla will a thousand years hence resemble the human species any more than he does to-day. It is true that the theory of progressive development has received the sanction of names which stand high in the scientific world; but we must take facts as we find them, and if we are reluctant to run counter to the opinions of such men as Darwin, we should remember that, especially in natural science, a too exclusive study of detail tends to disqualify men for taking comprehensive views, and that, while accepting them as authorities in the statement of scientific facts, we are in no way bound to agree with their conclusions.

There exists a school of modern Anthropologists which is by no means content with this physiological gradation. M. Pouchet, a prominent member of this school, says, in his work on the Plurality of the Human Race, "The intellect of vertebrate animals is identical, as their organism is identical; thus gradually descending, passing through the orang from man himself to all the mammalia." Again, "From animals to man, everything is but a chain of uninterrupted gradation; therefore there is no human kingdom."

It is this important question of the existence or non-existence of a fundamental and essential distinction between the psychology of man and the psychology of the lower animals which will form the subject of the ensuing remarks. I have thought it advisable, on a question which involves some of the most difficult and abstruse problems in metaphysics, to avoid attempts at demonstrative reasoning, and to confine myself to a practical consideration of a few of the arguments which have been put forward on behalf of the theory of intellectual gradation.

In regard to the first of the above extracts from M. Pouchet's work, I would observe that, even if we admit the existence both of a physiological and an intellectual gradation, the theory of their correspondence is not borne out by the evidence of observed facts. In the *Anthropological Review* for the year 1864, three instances, amongst many others, are adduced for the purpose of supporting arguments in favour

of the occasional manifestation of superior intelligence in brutes. One instance is that of a lobster, who was observed to drop a pebble between the shells of an oyster in order to keep them apart while he extracted the edible portion; another is that of an ant, who, finding himself alone in a pot of treacle suspended by a string from the ceiling, climbed up the string, and having rejoined his companions, reconducted them to the treacle by the same route; the third instance is that afforded by the great social intelligence of the bee.

But the bee, and the ant, and the lobster are all without the pale of the Vertebrata. The difference in structure between either of these animals and the Quadrumana is incomparably greater than the difference in point of intellectual value between any one of the above-mentioned instances of sagacity, and the highest manifestations of intelligence that have ever been recorded of the gorilla, or the chimpanzee. Are we not justified, then, in throwing aside the notion that the intelligence of the lower animals varies according to their structural approximation to man? It may be urged that the Quadrumana, who more closely resemble the human species in physical conformation, surpass most other animals in point of intelligence. But much of the intellectual reputation of the monkey is unquestionably due to the possession of a highly developed hand. This hand, with which he was evidently furnished with a view to his habitual residence in trees, enables him to break sticks and throw stones, and to perform other actions which are, as a rule, peculiar to humanity. Combined with his general resemblance to man, the possession of this prehensile member further enables him to manifest in a more human-like manner a quality for which I have been unable to find a more scientific term than "sportiveness;" a quality which is remarkable as having no apparent relation to the ascertained objects of animal existence, but which cannot be regarded as a proof of the mental superiority of the Quadrumana, inasmuch as it is found to a certain extent in nearly all quadrupeds. No one who has observed the gambols of a kitten can doubt but that if it had the hands of a monkey, its buffoonery would be of an equally intellectual order; but when the kitten has grown into a cat, and when, as we may suppose, its intelligence has increased, we no longer find the playfulness which the monkey retains to an advanced age. Moreover this quality is more characteristic of the lower than of the higher Quadrumana.

We may therefore dismiss this hypothesis of the co-ordination of a mental and physical gradation as untenable; and in doing so we clear the road, in regard to the psychological

attributes of an animal, to the view which I have before expressed as to his physiological attributes; viz., that they are proportioned to the necessities of his existence; and we cannot, in attempting to determine the psychical differentia of man and brute, base our reasoning on the analogy of physical structure with any regard to the results of observation.

The usual classification of the mental faculties is that which divides them into Feeling and Intellect. All feelings are instinctive; and the only objection to substituting the word "instinct" in this classification is that instinct may be defined as a tendency to act in a particular manner without reference to the reasoning powers (supposing them to exist), whereas "feeling" is the psychological condition which results in this tendency. Instinct is the only non-intellectual source of action; that is, all actions which do not proceed from the intellect are instinctive actions, whether the immediate cause of such actions is or is not within the scope of the perceptions. It is usually understood in a more limited sense, as implying, according to Paley, "a propensity prior to experience and independent of instruction." The defect of this definition is that, by excluding the element of memory, it necessitates a division of the sources of animal action into blind instinct and intelligence; whereas it is often a matter of great difficulty to decide whether any particular action performed by an animal may be reasonably ascribed to a perception of the consequences of that action. We see a duckling, which has been hatched under a hen, making for the water directly after it has emerged from the egg; and we see a bird startled by the sight of a gun. In the case of the duckling we have an indubitable instance of the operation of blind instinct; but on the other hand, the bird who takes to flight at the sight of the gun does so because it has learnt by experience to associate the appearance of the gun with the impression of danger. In both cases the animal obeys the dictates of its instinct, and we are not warranted in looking on these actions as springing from two different sources. Memory is a distinct quality in itself, and is peculiar neither to intellect nor instinct. It is indispensable, as we well know, to the exercise of the reflective powers, and although, in regard to instinct, we can dispense with it on Sir Isaac Newton's hypothesis of the continual intervention of the Deity, we may ask why, in this case, is not the bird frightened by the gun *before* the destructive properties of that weapon have been practically impressed upon it? The fact is that memory enters very extensively into the operations of instinct, and is extremely useful in

adapting the animal to changed conditions; and the imperfect conception of the latter quality which I have just mentioned as evidenced in Paley's definition, is, perhaps, attributable to the fact that the attention of those philosophers who have sought to define the nature of instinct has been too exclusively monopolized by what, regarded from a human stand-point, is its most remarkable and distinctive feature; viz., its tendency to produce actions which previous experience could not have shown to be expedient; and that, consequently, they have merely differentiated it from intellect, rejecting from their definitions a quality which, as a more careful observation would have taught them, is common to both. Hence the occasional influence of memory in instinctive actions has been generally either ignored or denied; but as long as we entertain the notion that the application of past experience to present circumstances necessarily implies an act of intelligence, so long will our views of comparative psychology be erroneous.

The brute, being destitute of human intelligence, is endowed with a wider range of instinct. Both brute and man experience a tendency to fly from the presence of a stronger antagonist; but the instinct, for instance, displayed by the beaver in the construction of his dam has apparently no analogue in human psychology, because the wants of man in this respect are supplied by his intelligence. So long as they are subjected to the influence of a common instinct, they both behave in a similar manner; but, while the beaver always builds his dam in the same way, an Englishman constructs his house, and frequently the same house, on five or six different architectural principles. We cannot fix on any style of architecture which is peculiar to a variety of the human race in the sense that a particular style of nidification is peculiar to a given species of bird. A Chinaman or an American Indian can build his house like an Englishman if he chooses; but we cannot teach a blackbird to build his nest like a thrush, any more then we can induce a bee to construct his cell after the fashion of wasps. And this unvarying uniformity, by which its operations are characterized, not only constitutes a distinctive feature of instinct as compared with the intellect, but it also furnishes us with the key to its practical objects. The animal, having certain duties to discharge in the natural economy, is furnished with instincts which tend towards the preservation of himself and his species as a means to the fulfilment of those duties. The feelings from which all his actions proceed may be classified under the same head: his fear, his anger, his love, are but the handmaidens

of the grand instinct of self-preservation; and we could not deprive him of one of these without depriving him of his existence.

Instinct being necessary to, and consequently inseparable from, animal existence, man possesses it in common with the lower animals. In addition to instinct, man also possesses what are termed the *intellectual* faculties.

One of the chief objections which have been urged against the theory that intellect forms a distinctive characteristic of humanity, seems to be founded on the difficulty of comprehending its various manifestations within the limits of a single word. Generally speaking, the question "what is intellect?" is nothing more or less than a challenge to solve this philological problem. The ground has been gone over so often, that it is impossible to make fresh discoveries, and the man who attempts to frame an exhaustive definition of intellect merely expresses his adherence to the view of a particular metaphysician who has preceded him. Does it depend on the power of reflection? or of comparison? or of forming abstract ideas? or is it simply an independent will acting upon highly developed animal faculties? We may accept either of these definitions singly, or we may accept them all, as describing different phases of the same quality, or we may, on the other hand, confess ourselves unable to form a clear conception of the essential nature of the intellect; but we know quite enough about it to be able to define it negatively as regards the psychology of the lower animals, just as a geologist may be unable to describe the nature and properties of a given rock, and yet may be perfectly certain that it is not granite. We know that, whatever intellect *is*, it is *not* a higher development of those instinctive feelings which are common to man and brute; for the passions of man are not different in their nature, nor at all superior, to those of brutes; while even the advocates of the psychological identity of man and the lower animals allow the immense superiority of man *intellectually;* and if human intellect and human feeling were different developments of the same quality, there would be intermediate degrees, and the two principles would never be in antagonism to each other.

Nor does there seem to be any good reason for supposing that the intellect is identical in kind with the *natural sagacity* of animals. Whether animals possess this natural sagacity *in addition* to the instinct is not an easy question to answer, at least with any amount of certainty; but I think that sensation and memory will account for all the phenomena of animal actions. An animal endeavouring to escape from an enemy,

under the influence of fear, and seeing two ways of escape, will select the more feasible one. There is no reason for assuming the exercise of reflective powers here, unless they are more perfect than human reflective powers, which are generally paralyzed in moments of extreme danger: in fact the very rapidity with which an animal acts should preclude this assumption. We know that the impression made by an object on the senses is in many cases involuntarily retained by the memory, and regulates mechanically our future conduct with reference to that object; and we may surely assume the existence of a similar principle in the lower animals. The chamois who finds himself, when followed by the hunter, suddenly confronted by a chasm the width of which slightly exceeds his leaping power, will not attempt to get over it if there is any other way open to him. Are we to suppose that he reasons with himself as to his power of leaping compared with the breadth of the chasm, or that the sight of the chasm impresses on him instantaneously the improbability of his arriving safely on the other side? The great functional difference between this quality and the intellect is that it never rises superior to the instinct as a *source* of action, but is always subordinate to it and employed in carrying out its dictates.

We have next to consider whether anything analogous to the human intellect is to be found in the psychology of the lower animals, or whether all their actions may not be traced to an instinctive source. Mr. Pike, in a paper "On the Sciences of Mind and Language," read two or three years since before the Anthropological Society of London, and pronounced by the President of that Society to have been "conceived in a most liberal spirit," says, "There is not, I believe, any *à priori* reason to suppose that there is a difference of kind between the brute intellect and the human intellect. Whatever difference may exist, must be shown to exist by evidence and not taken for granted; and the evidence which bears upon this point will be the basis of comparative psychology."

But we cannot well bring *à priori* argument to bear on the matter unless we are agreed as to the original object of the creation both of man and brute. If we believe that the object of the existence of brutes is fulfilled by the fact of their existence and by the involuntary discharge of those functions involved in the maintenance of their existence, while man, on the contrary, was created for a higher destiny, there is good *à priori* reason for supposing that he is separated from the brute, as regards his psychical qualities, by a broad line of de-

marcation. We can afford to discuss the question on *à posteriori* grounds; and considering that there exists between man and brute a psychological difference totally disproportionate to the physiological difference, considering that this difference is incomparably greater than that which can be shown to exist between any two samples which may be selected from the brute creation, notwithstanding great variety of structure—considering that the vast majority of the actions performed by an animal are *unquestionably* due to the operation of his instinct—considering that in *language* man possesses an instrument for exchanging ideas with the most degraded members of his species, without that appeal to the instinct which constitutes the only means by which he is able to influence the actions of lower animals—I think it is tolerably evident that Mr. Pike has coolly placed the *onus probandi* on the wrong side.

The arguments which he has put forward in favour of the intellectual similarity of man and brute, are not so irrefutable as he seems to imagine. They consist, to a great extent, of specimens of a style of reasoning which is rather extensively employed by the upholders of the views which he advocates, and which is by no means calculated to dissipate the obscurity in which the subject is involved.

The opinion of a given metaphysician as to the point at issue having been selected, and this opinion having been assumed to constitute a definition intended to express the sum of the intellectual differences between man and brute, it is then demonstrated by extending or perverting the meaning of the terms employed (a process which is rendered comparatively easy by the unavoidable ambiguity of metaphysical language), that the definition embraces psychical phenomena which are indisputably manifested by certain of the lower animals. Thus we find Mr. Pike disposing of Locke's opinion that brutes do not possess *general ideas*, an opinion endorsed by Professor Max Müller. Quoting a remark of Professor Müller's, to the effect that, "when a whale is struck, the whole shoal, though widely dispersed, are instantly made aware of the presence of an enemy," Mr. Pike asks, "What is communicated in this case but a general idea—the idea of danger?" Here we have a characteristic example of the method of ratiocination which I have just described. In making the word "idea" include the simple operation of an object upon the instinct, Mr. Pike invests it with a meaning which, as far as I am aware, has never been attached to it either by Locke or any one else. I have already pointed out the fact that there is an essential difference between Intellect and Instinct, as well as the entire

absence of any proof that an intellectual operation intervenes—in the animal psychology—between the perception of an object and the action resulting from such perception. We may, indeed, regard the whale as revolving within himself the expediency of adopting this or that course of action, and ultimately arriving, by an inconceivably rapid process of reasoning, at the conclusion that it is advisable to make off; but, inasmuch as he always *does* make off under the circumstances, it is obvious that any such process of reasoning is entirely unnecessary, even if we *can* call that a process of reasoning which invariably leads to the same conclusion. Nor does the communication of the "idea" to the other whales argue the possession of a higher order of intelligence. We know that many animals manifest certain feelings by involuntary motions of the body. A dog expresses pleasure by wagging his tail, a cat by the elevation of the same member. We may suppose in like manner that the whale shows his alarm by some movement which is a direct and invariable product of that feeling, and which is readily comprehended by the other whales, as it would be common to all of them if similarly situated.

With the word "general" Mr. Pike has taken a liberty which almost amounts to a pun. As applied to "idea" it means either the distribution of the same idea entertained by one individual amongst several objects, or the distribution of a particular idea of the same object amongst several individuals. Conventional usage sanctions both meanings, but while Locke used the word in the former sense, Mr. Pike interprets it in the latter, in which sense it does not in the smallest degree affect the value of the term "idea" as a psychical phenomenon. That animals have general *impressions*, or, in other words, that the same feelings of fear, anger, &c. are produced by different objects, is beyond all doubt; and our notions of creative wisdom would be seriously modified if we found a hare running away from a dog, and standing still when attacked by a wolf, or flying from both animals and not getting out of the way of a falling tree. But in the case mentioned by Mr. Pike the impression—for it is not an idea—is only general in so far as it is shared by the whales generally.

In another place, speaking of the fact that a parrot has been seen to drop a hollow nut without attempting to crack it, Mr. Pike asserts that the parrot "could only have arrived at the conclusion that the nut was hollow by what philosophers would dignify with the grand title of syllogism."

Every action, whether of man or brute, *may* be regarded as the result of a syllogistic process. But a syllogism is merely

the artificial imitation of a natural process; it is a logical instrument, contrived for the purpose of demonstrating that which was not previously evident to the perception. It is a proof that man has the power of contemplating the operations of his own mind, a power which the brute does not possess, so far as is shown by any evidence to the contrary; and this self-consciousness is very different from the consciousness of physical individuality with which Mr. Pike endeavours to confuse it. To state the case in other words, the lightness of the nut conveys to the parrot the impression of worthlessness; the necessary factors of the psychological operation which precede the rejection of the nut are nothing more than memory, which is an involuntary agent, and feeling or instinct.

The same method of reasoning has been applied to the argument that *language* constitutes a fundamental distinction between man and brute. The objection may be stated thus: "Language indicates the possession of intelligence; brutes possess a rudimentary language, therefore they possess a rudimentary intelligence." In extending the signification of the term language so as to make it comprehend the cries, &c. of brutes, it is evident that we deprive it of its distinctive character as an exponent of thought. It is admitted that this "rudimentary language" is limited to the expression of feeling. But until it is shown that feeling can be developed into thought, it is idle to argue that the vocal expression of feeling can be developed into the vocal expression of thought.

Language, in the proper sense of the word, is not necessarily articulate, as we know from the case of deaf mutes; but whether oral, or written, or expressed by means of the finger alphabet, it is *always* the vehicle of thought, *never* of feeling. For if we eliminate the physical element, the psychical phenomena of language remain unaltered, and to make the organic production of sound a common psychological basis is illogical in the extreme. If any doubt remained on this point, it might be set at rest by an impartial comparison of the nature of the vocal expression of thought and feeling as characteristic of the human psychology. Let us suppose a man undergoing a painful surgical operation. He experiences a strong tendency to cry out. He has no object in doing so; in fact he would avoid it if he could; and it is not until the instinctive tendency has overpowered the opposition of his will that he utters an exclamation of pain. Even then his will does not always yield entirely, and he endeavours to clothe the expressions of pain in articulate language; but if the pain is intensified until the resistance offered by the will is entirely

subdued, his exclamations merge into a purely animal cry—the natural, involuntary, instinctive expression of suffering. The vulgar habit of swearing (erroneously so called) offers another instance of the instinctive tendency to express feeling vocally. When a man swears he does not represent to himself the awful ideas which are generally attached to the words he makes use of. He obeys a natural inclination to vent his anger orally; up to a certain point he employs articulate words drawn from a limited vocabulary which habit has rendered familiar; but it is known that human beings are capable of being enraged to such an extent that even this *quasi* language fails them. In these and other similar instances the expressions of thought and feeling stand in an inverse ratio to each other.

We see, therefore, that, as regards the human psychology, the language of thought and the "language" of feeling differ in their origin, in their nature, and in their objects. And, considering the strong resemblance which exists between the oral expressions of feeling in man and the cries of brutes, we might infer from analogy that these cries are never used for the purpose of conveying information, which is the proper function of language. It is said, however, that "a house-dog barks for the purpose of acquainting his master with the presence of an unseasonable intruder." It might be argued with equal propriety that the geese in the Roman citadel cackled in order to let its occupants know of the unexpected advent of the Gauls. The fact is that the dog barks because he is alarmed; he barks whether his master is at home or not, and for one instance in which he barks from an ostensible motive, he barks in two without any apparent reason whatever. And whenever we *can* trace his barking to its cause with anything like certainty, we invariably discover that cause—and the same applies to the cries of other animals—in the action of some object upon his feelings.

The argument from the analogy of human cries and the results of observation are further corroborated by a superficial examination of the mutual relation of thought and language. There are two mental operations involved in language, namely, the acceptation of a word, or other conventional sign, as the representative of an idea, and the complete thought or junction of the ideas of substance and activity, expressed by the noun and verb—generally in the indicative mood. Now if we assume the cry of an animal to be uttered with the view of conveying information, we must translate the cry by an entire sentence, passing over the simpler elements of which every sentence is composed, for it has never been shown that animals

are capable of representing simple ideas by conventional signs, either oral or otherwise. Thus the "language" of brutes approaches more nearly to the complex than to the simple phenomena of human speech. Again, the vocal sounds which an animal is able to produce are few in number: hardly, if ever, corresponding to the number of his feelings, they are totally inadequate to represent the objects by which he is surrounded, and still more inadequate to express combinations of the ideas of such objects, together with the requisite modifications of time and space. It may be said that language does not always express a thought or judgment, but a feeling, as in the case of the optative, and perhaps the imperative mood. But these moods are for the most part nothing more than subjunctives with an ellipse of the principal verb. However this may be, we always use these moods for the purpose of informing another that it is our wish or will that such or such a thing should happen or be done, even though the information be conveyed merely with the view of exciting sympathy, and when an optative sentence seems to degenerate into an expression of feeling, we may apply the remarks which I have already made as to the vocal expression of human feeling generally.

Although articulate language is not necessary to the communication of thought, yet verbal language (I am compelled to use this pleonasm owing to the frequent misuse of the term "language") is indispensable. And this conclusion is nowise affected by the fact that a complete thought may be communicated by means of a simple sound or gesture as a conventional symbol; for symbols of this nature only convey the meaning which has been previously attached to them by verbal agreement. Mr. Pike, however, says, "They (the symbols) may be used for the purpose of communication (but not in the form of articulate speech) as in communicating ideas of food, danger, game, &c. Both brutes and men use this kind of language. The cawing of the crow, the whistle of the thief, the look of the lover, may all be classed under this head."

In this classification there seems to be considerable confusion of ideas. Cawing is, I believe, peculiar to rooks (I presume Mr. Pike alludes to rooks); at all events it is natural to them, and not learnt by association with other rooks. If half a dozen rook's eggs could be taken to the antipodes and hatched there, I do not think any one will doubt but that the young rooks would caw as soon as they were old enough. But I am not aware, on the other hand, that whistling is either peculiar or natural to thieves; although such a state of affairs would add greatly to our social comfort, and would be

at the same time of material assistance to detective officers. The only point of resemblance between a caw and a whistle is that they both mean nothing; directly we attach a conventional meaning to a whistle, the resemblance ceases. If one thief whistles to another, he may mean "there is some one coming," or "there is no one coming," or "it is all right," or "it is all wrong," according to previous arrangement. An arrangement of this nature is alluded to by Burns—

"O whistle, and I'll come to you, my lad."

Are we to suppose that the signification of a caw is settled by a preliminary discussion amongst the rooks? or, if not, why is it classed in the same category as a whistle? A symbol conveying a complete thought is a step in advance of language, and there is nothing to support even the probability that a rook possesses the gift of language in the most rudimentary degree. The expression "look of the lover" does not convey a very definite idea, but I think it will be universally agreed that the look, in order to be effectual, must be entirely spontaneous; and if a lover should attempt to express his affection by a voluntary pose of his features, the effect will probably be diametrically opposite to what he intends. Between the look of the lover and the whistle of the thief there are the characteristic differences which I have previously specified; one is involuntary, the other is deliberate; one is natural, the other is conventional; one is the expression of feeling, the other of thought. It is not very clear, therefore, what Mr. Pike means by the statement that "brutes make use of symbols in communicating ideas of food, danger, game, &c." But it is perfectly clear that brutes do *not* express either complete thoughts or simple ideas by means of symbols, and the only proof Mr. Pike adduces to substantiate his opinion, viz., his having "impressed upon a dog the meaning of the general name cat" is worth nothing.

He answers Max Müller's assertion that "brutes neither know nor *name* anything," by a quotation from Milton—

"Knowest thou not
Their language and their ways? They also know,
And reason not contemptibly."

Unfortunately, however, for Milton's infallibility as an authority on the subject of comparative psychology, a writer in the *Anthropological Review*, whose arguments, if they proved anything, would prove that brutes are greatly superior to man both intellectually and morally, quotes, for the purpose of

contradicting it, another passage from Milton, when he speaks of the

"Smile that from reason flows,
To brute denied."

I have not thought it worth while to allude to some interesting remarks which this writer makes as to the moral attributes of dogs. Any one who has occupied himself with the tuition of these animals knows perfectly well that the "moral sense" of a dog is nothing more than the instinctive association of certain actions with personal inconvenience.

With reference to the application of this double system of physical and mental gradation to the human family, I will premise that the evidence which we possess concerning the physiological diversities of mankind does not point to the conclusion that these diversities ever amount to differences of species. Naturalists have not yet decided what species is as regards the lower animals, and perhaps the lower animals themselves are the best judges of the matter. The test which has been received with most favour is hybridity, and this test has been applied to man. As one of the results of the observations which have been made in this direction, it has been asserted that the hybrids of the Negro and Caucasian are not indefinitely fertile *inter se*. Granting this fact, what does it prove? Simply that the constitutional modifications which adapt mankind for a residence in a tropical climate, and those which suit him for a temperate one, do not readily co-exist in the same individual. It is generally allowed that man's physical organization is subject to considerable variation under the influence of the circumstances in which he is placed, and that the tendency of such influence is to adapt him to those circumstances. The Negro has existed for generations under circumstances widely different from those which have modified the physique of the Caucasian; is it, then, matter for wonderment that the Negro-Caucasian hybrid should inherit an organization disqualifying him for existence either under one set of conditions or the other?—a compound, anomalous organization containing within itself the germs of weakness and decay? As yet, however, the evidence bearing on the sterility of these hybrids is inconclusive, and it is absurd to compare the questionable sterility of mulattoes with the invariable sterility of mules and other brute hybrids. Professor Carl Vogt, in his *Lectures on Man*, has endeavoured to prove that the anatomical differences between the Negro and the Caucasian are as great as those which separate* two kinds of *cebus* usually admitted to form

* *Lectures on Man*, p. 211.

distinct species. But at the very outset of his comparison of the structures of the *cebus* he states a fact which entirely invalidates his argument; viz., that, while one *cebus* has five ribless lumbar vertebræ, the other has six; for all the osteological and other differences between various human types put together do not equal in importance the difference of a vertebra. Again, Professor Vogt takes great pains to show that the Negro presents indications of anatomical approximation to a simian type, especially instancing the great length of his hand,—apparently oblivious of the fact that the Australian, who is universally placed *below* the Negro in the gradational system, is, barring a slight abdominal protuberance, as elegantly formed as a European, and that his hand is in the same relative proportion to the rest of his body; there is little doubt that the value of these and other physiological differences has been greatly exaggerated.

The intellectual differences between the various races of mankind are still less strongly marked than the physical. We contrast intellectually the Bushman or the Negro with the highly civilized European, and at the first blush there certainly appears to be an immense disparity. But a very cursory examination is sufficient to show us that the superiority of the European is almost entirely the result of adventitious circumstances. Civilization is not the necessary result of a state of high intellectual development. History does not afford a single example of a nation attaining even a moderate degree of civilization without extraneous assistance. We can trace the stream of modern civilization backwards, until it loses itself on the banks of the Nile. We get our laws from Rome, our taste for literature and the arts from Greece, our religion from Judæa; but does any one imagine that, if Egypt and Greece and Rome and Judæa had never existed, the Celt or the Teuton would have spontaneously developed a civilization equal to that of Europe at the present day?

And although Europe, as a whole, is far more civilized than any nation of antiquity, we do not find that the progress of civilization has been accompanied by a perceptible advance of intellectual power; in fact, it is questionable whether an intellectual comparison with ancient Greece or Rome is not rather to our disadvantage. Furthermore, Europe presents great intellectual uniformity. Within the last six centuries England, Germany, Italy, France, and Spain have produced magnificent literatures; one of the greatest epic poems comes from Portugal; while the Slavonic nations yield to none in literary ability. Considering, then, that Europe was peopled from many different sources, can we doubt that the intel-

lectual activity, the moral refinement, the civilization of Europe is legitimately attributable to the influence of external causes?—can we doubt, looking at the comparative similarity of the conditions to which the different European nations have been subjected, that the very uniformity I have spoken of is a proof that the origin of these intellectual and moral phenomena is *not* to be sought for in the operation of occult psychological principles? I admit that the Negro has been in contact with more civilized nations for some thousands of years without deriving any perceptible benefit therefrom. But it should be taken into consideration that the circumstances under which he has been brought into relation with superior races have not been calculated to foster and develop whatever intellectual qualities he may have originally possessed. His distinctions of rank have been disregarded; high or low, he has always been treated as a slave; he has had no aristocracy of intellect and refinement to look up to and imitate; he could only find models amongst his masters, and he could scarcely be expected to sympathize with *them*. Placed under favourable circumstances, however, the Negro is by no means mentally deficient.

A few years since four youths of pure negro blood were sent to England from Sierra Leone to be educated as surgeons at the expense of the Church Missionary Society. They passed the examination of the Royal College of Surgeons, and were subsequently sent to the West coast of Africa in the capacity of assistant-surgeons to the British army. One of them, by the bye, Dr. Horton, is a man of very considerable intelligence. Now, although the examination of the Royal College of Surgeons may not be a very high intellectual or educational test, it could not be passed by a sort of half-baboon; yet if these gentlemen had been left to run wild in Sierra Leone, they would probably at the present time be neither better nor worse than the rest of their countrymen.

On the other hand, if we turn to our own country, we see in the midst of our civilization thousands of human beings brutal in appearance, in language, in ideas; with little or no sense of morality; frequently only superior to the Andaman Islanders in as far as they are restrained by the fear of punishment. Yet these men are of the same blood as ourselves; they are continually exposed to the ameliorating influence and example of those immediately above them, and their ranks are being constantly recruited by those who have been unfortunate in a higher station of life. Perceiving, therefore, this moral and intellectual degradation around us, recognizing the causes by which it is produced, knowing that these causes have been in

unrestrained operation amongst savage peoples from time immemorial, it is surely irrational in the last degree to adduce the similarity of result as a proof that these peoples are endowed with intellectual faculties radically distinct from our own.

The inference deducible from the foregoing considerations is so obvious that we cannot afford to sacrifice it to the exigencies of the gradational system. Great as are the intellectual differences which distinguish the various races of mankind, they are not to be classed with the difference which separates him from the brute, and it is difficult to understand the affectation which pretends to be "unable to discriminate between the psychical phenomena of a Bushman and a chimpanzee." The Veddah who counts as far as five, can count as far as fifty; the Malay,* who "has no general term for tree," has hundreds of general terms which require for their conception an equal or greater degree of intellectual power. The Veddah whose faculties are absorbed in a continued struggle for existence may have first neglected and then forgotten the existence of a God, just as the Andaman Islander may have forgotten the use of fire; but there is one characteristic of humanity which is never found wanting—I mean a recognition of the distinction between good and evil. The good may not be identical with our good, nor the evil with our evil; the standard of morality may be higher in one nation and lower in another, or it may vary on the same plane, but it is always there.

We see the animal furnished with instincts the objects of which are at once found in the necessities of his existence. We see man likewise endowed with instincts without which he would have been extinct long ago. We see him in addition possessed of a quality essentially distinct from the instinct and entirely unnecessary to the preservation of his existence, a quality which "presides over his actions and enables him to follow out the end he proposes to himself." To what purpose man was gifted with the intellectual powers, the free will, and the moral responsibility thence flowing, is a question which is beyond the scope of philosophical investigation. There is a theory as old as the hills, and perhaps older, but which with those who confound novelty with progress, and the advance of human knowledge with the advance of the human mind, has fallen into disrepute apparently because it *is* old—

"Lume v' è dato a ben ed a malizia."

---

* *Anthropological Review*, 1864. This, however, is incorrect. The Malay *has* a general term for tree.

The CHAIRMAN.—I am sure you will all cordially concur in a vote of thanks to Mr. Morshead for his valuable paper. (Hear, hear.) I am sorry he is unable to be present; and now I invite discussion upon the paper.

Rev. C. A. ROW.—I do not rise for the purpose of impugning the general statements or results which Mr. Morshead has embodied in his paper, but I own I do think that some portions of his argument have not been properly sustained. If I understand him rightly, Mr. Morshead considers that all the actions of brutes may be accounted for by the use of the terms instinct, memory, and natural sagacity. Now, I confess I am unable to understand what natural sagacity means, unless it be some exertion of what we call intellect. Mr. Morshead denies that brutes possess intellect, although he admits his inability to define what we mean by intellect. Now, I do not mean to say that an animal has the same intellect, or anything like the same intellect, as a man possesses, but I do think that brutes possess an intelligence which produces, though of course in a much less degree, results something like those produced by the intellect of man. If I see in brutes certain results produced, which, had they been in us, we should say resulted from man's intellect, I think I have ground for inferring that there is a certain amount of intellect, though, of course, of a much lower kind than man's, at the bottom of those results; and I cannot think what natural sagacity is in brutes, unless it is some sort of intellectual power. Mr. Morshead assumes that everything done by animals is the result of instinct or memory, or both combined. Now, I cannot see what substantial result can be accomplished by memory, unless we give it the aid of some kind of intellectual power. Take the instance, which Mr. Morshead has quoted, of a bird "taking to flight at the sight of a gun, because it has learnt by experience to associate the appearance of the gun with the impression of danger." Now, I have often held a stick up towards a bird, and it has not been in the least alarmed; but I have no doubt that if I had held up a gun instead, it would have made off at once. Is that the result of instinct or of memory? or is it the result of some reflective intellectual power? I cannot understand how instinct alone could make a bird apprehend that there is danger in a gun, and none at all in a stick. I know that a great many of the anecdotes one reads of animals are not altogether reliable, but I will pledge my word for the truth of one or two which I am about to mention. I formerly kept bees for some time. Now, any one who is at all acquainted with the habits of bees is aware that the bee constructs a cell according to the perfect principles of mathematics, and it is of course impossible to suppose that that is the result of anything but instinct. But, under circumstances of necessity, it is well known that the bee is capable of varying the size, form, and build of its cells, and that, I think, goes some way to show that the bee possesses some measure of intellectual power, though not of the same kind as, and inferior to, man's intellect. In a village where I kept bees at one time, a number of other persons also kept bees, and a hive full of comb was kept in a house in my garden. In swarming time a great number of the neighbouring bees came

into my garden, and a day or two afterwards a "swarm" took place in the village, and came down into my garden and settled in my hive. Now, that is a very important fact. Every one knows that bees, in swarming, always follow the queen bee; but their tendency is to "settle" as soon as they can. Now, what took place here? They did not settle near the spot where the swarm took place, but sent out a number of scouts, who came into my garden and found the best possible spot for settling—my empty hive. It should be borne in mind that the queen bee never leaves home except once in swarming time, and once in early life. These scouts, then, must have had some means of communicating with her concerning the hive they had found, and informing her that there was a suitable habitation for her and for them within a seven minutes' distance. The queen bee, necessarily ignorant of the road, must have been conducted to the spot by the scouts. It is impossible to ascribe all these things to the operation of mere instinct, and, as to memory, that is altogether out of the question, as the queen bee could have had no memory upon the subject at all. I have also kept dogs; and here is a remarkable occurrence which, I believe, shows conclusively that a dog has some higher power to guide him than that of mere instinct. One of my dogs was a setter, which became an expert and inveterate poacher; and our man had a large sheep-dog, which was a very fleet runner. The setter used to persuade the sheep-dog to go out with him on his predatory excursions, and there they would "hunt in couples," the one starting, and the other catching the game. I have taken meat to the setter at the time when he was usually fed, and I have found that, instead of eating it all himself, he has taken part of the meat to the sheep-dog, and then, after bribing him in that way, and after a little play between them, they have gone off together hunting for game. Now, if I were to persuade any one to do an act which he did not wish to do, I think you will admit that I should be exercising some rational power. And that is precisely what used to occur between the two dogs. The setter used himself to eat less than he was allowed, and give the remainder to the sheep-dog, in order to induce him to become an accomplice in the commission of an illegal and improper act. Another instance of a dog exercising reasoning power was at Plymouth Harbour. The harbour is three parts of a mile across, and between the Devonshire and Cornwall sides a steam bridge ferries passengers across. I have seen the dog I refer to come down to the water's edge on one side just as the steam bridge had started for the other. And what used the animal to do? He knew that in half an hour the steam bridge would be back again, ready for a fresh journey; and the dog would wait quietly on the beach until the steam bridge came back, and it would then jump on board. I maintain that such a course on the part of a man would plainly be the result of a process of induction, and I think we have no right to assume that the dog was not capable of going through some such mental process himself. There are various other instances which I might give you of animals, and especially of bees, which I believe show the possession of some intellectual power, though of course I am far from contending that that power is anything like the intellect of man. Animals, I think, possess ideas,

though the number of their ideas is very limited indeed; and they are capable of exercising a comparison of such ideas as they do have. I understand Mr. Morshead to state that a dog only barks under the influence of fear. I doubt that very much; but at any rate, whether that is true or not, I know that a dog barks sometimes, and if it fails in arousing the attention of a person near, whose attention it wishes to arouse, it will go to him and endeavour to attract his attention in some other way, as though saying, "Why don't you come and see what is the matter?" Mind, I am not controverting the general conclusions of Mr. Morshead: I only wish it to be understood that I should arrive at those conclusions on grounds considerably different from his. One of the great distinctions between man and the lower animals is found in the possession by man of the moral faculties. I do not mean to say that a dog, however, is entirely void of all moral ideas, as Mr. Morshead has asserted. I am not prepared to say that, because I remember a dog which I had for many years, and when I was going out, if I said, "Dash, you must not come"—not at all in an angry tone—the dog, which at other times was anxious to follow me, would at once stop and remain at home. I do not mean to say that Dash understood the language I used, but he had some understanding which, to my mind, was something more than mere instinct. I think the dog has unquestionably a sense of affection to its master, and that certainly has some remote analogy to the moral qualities. A great many of the brutes exercise a kind of morality which, if all men only possessed as much, would make us all better and happier than we are. The great distinction between man and the lower animals is, however, the large absence on the part of brutes of moral ideas, and, above all, in the absence of spiritual ideas; and in those two branches I include a large range of ideality. Of course I am prepared to admit at once that I do not think brutes can reason syllogistically, but I am thoroughly satisfied that human beings never reason syllogistically either. No doubt we can reduce our reasoning into the syllogistic form; but, practically, we never do reason in that way. We pass with great rapidity over a vast number of links in the chain of our reasoning. There is another point in Mr. Morshead's paper which caught my attention. He spoke of "the chamois who finds himself, when followed by the hunter, suddenly confronted by a chasm, the width of which slightly exceeds his leaping power, and will not attempt to get over it if there is any other way open to him;" and he thinks, because the animal makes its choice instantly, that therefore it is impossible it should have been influenced by any reasoning power. Now, I apprehend that some of the highest processes of reasoning and of intellect are gone through instantaneously. In my own case, I have often found, when I have been engaged in literary composition, that many of the things I have done quickest have been the best I have ever done; and surely such work belongs to the highest class of intellectual work. A vast number of our intellectual actions are accomplished more rapidly than we can ever analyze. Because I cannot analyze the process by which I speak to you now, does it therefore follow that that process is not highly intellectual? I do not think because a

brute acts very suddenly that that is to be taken as a proof that it acts only by instinct and does not give some consideration to its acts.

Professor MacDonald.—I have listened with great interest to Mr. Morshead's paper, but I must say I object to his opening sentence:—

"There is no doubt that man, as an animal, physiologically considered, is superior to the other members of the animal creation; but the superiority of his physical organization alone is not sufficient to justify us in assigning to him a separate place in nature."

I consider that man's physical and psychical qualities place him naturally as far above vertebrate animals as vertebrate animals are placed above the invertebrate. Man is an animal, certainly, in his physical constitution, but in no way can he be naturally included within the class of brute animals. He is not merely superior to them, but he belongs to a higher class altogether. His spiritual and intellectual qualities place him far above them. Man is the only animal—supposing you are reluctant to allow me to remove him from the class—man is the only animal capable of apprehending infinity: he is the only animal capable of apprehending a God. Races of men may differ, some of them going down to a very low level of intelligence; but whatever differences you may find among them in regard to the possession of the high qualities of humanity, yet still you will always find that even the lowest races of mankind are infinitely superior to even the highest creature among the inferior animals. There is one great distinctive mark of power which man possesses and which the lower animals have not—I mean the ability to construct offensive and defensive weapons. The lower animals have no power of making such weapons. They may be able to take up a stone or a stick, or some other missile lying in their way, and throw it out at anybody near them whom they are afraid of or wish to injure, or they may attack him with their offensive organs; but they cannot construct an engine either to protect themselves or to be aggressive to any one who approaches them. That I conceive to be a strong reason for placing man in a kingdom separate from animals altogether, and therefore I object to the assertion that man is not entitled to "a separate place in nature." Mr. Morshead goes on to say,—

"He is subject to the same general laws; he is born; he develops into maturity; he eats, drinks, propagates his species, and dies; and so far he is nothing more or less than an animal."

Why, the same thing might be said of a prawn, of an insect, and even of still lower members of the animal kingdom! They are born; they develop into maturity; they eat and drink; they propagate their species; and they die. But all that does not make them equal to man. Then Mr. Morshead says, speaking of "all animals, man included":—

"The causes of sensation afforded by the world which they inhabit in common with ourselves being invariable, their organs of sensation are formed on the same principles as ours; having the same relation to space and matter, they are furnished with suitable organs of locomotion,—and so forth."

So far as the organs of locomotion are concerned, the inferior animals are, no doubt, furnished with such organs; but that does not prove that their organs of sensation are the same as man's, either in quality or in extent. I suppose he does not mean to say that they are the same in extent and in kind—

Captain FISHBOURNE.—He argues rather the other way, I think.

The CHAIRMAN.—His view is, that man to a certain extent enjoys these things in common with the inferior animals. Man's eye, for instance, is a valuable organ; but it only belongs to the same class as that of the eagle.

Professor MACDONALD.—There is something in favour of the general reasoning, that animals indicate a certain amount of intelligence or natural sagacity, and that it is difficult to deny them some amount of reasoning power. Mr. Morshead has mentioned the cawing of the rook. Now, it is a very singular thing that rooks in the country are perfectly aware when it is Sunday; and that on that particular day of the week you will find them resting quietly on the boughs of the trees within a very short distance of you, or walking about perfectly fearless at your approach—

Mr. REDDIE.—I believe that is confined to Scotch rooks, is it not? (Laughter.)

Professor MACDONALD.—You know a Scotchman is quite entitled to explain his experience and the observations made by his countrymen. (Laughter.)

The CHAIRMAN.—I am afraid the rooks are not quite so good in this southern quarter of the country. (Laughter.)

Professor MACDONALD.—Probably you have not here the same respectful observance of the Sabbath. (Laughter.) With regard to the indications of intelligence which dogs display, there is really no end to the cases that might be quoted. My brother-in-law had two small favourite dogs, and they also knew when it was Sunday—

The CHAIRMAN.—I think dogs, in a well-regulated family, generally do know when it is Sunday. (Hear, hear.)

Professor MACDONALD.—My brother-in-law could never leave the house on any weekday but the dogs were out before him; but on Sundays they merely accompanied him to the door and there stopped, as though to bid him adieu. It has been said that the lower animals are not capable of syllogistic reasoning, and for their own sakes I think it is a great blessing for them that they are not. (Laughter.) I quite agree with Mr. Row, that, though our reasoning may be reduced to syllogisms, we do not practically reason syllogistically. Something has been said as to the way in which bees build their cells. Now, it is very well known that some of the best-formed ships have been built by people who knew nothing about mathematics, but who constructed them upon sound mathematical principles, and those ships have been most successful in their sailing qualities; while others, built in the royal dockyards of the country, under all the advantges of skilful mathematical supervision and with every engineering advantage, are not always so

successful. As to the different forms which have been found in the cells of bees, the variation in shape is generally caused by some interference with or obstacle in the hive itself; and if such a variation merely results from want of room in some particular direction, that is only an instance of architectural necessity or compulsion—

The CHAIRMAN.—It is rather more than that, I think.

Professor MACDONALD.—With regard to the endeavour to find the difference between instinct and intellect—where the one ends and the other begins, which is a very narrow point indeed—I am afraid it is impossible to draw a strict line of demarcation. They are as difficult to separate precisely as heat and cold. We may form certain boundaries and make definitions, but I do not think they are altogether tenable when made—

The CHAIRMAN.—You consider that the one merges by such insensible gradations into the other, that it is hard to mark the distinction between the two.

Professor MACDONALD.—I do. I may say, before sitting down, that I am very well pleased with the general conclusions of Mr. Morshead on the subject, except in the assumption that man is nothing more than an animal.

Captain FISHBOURNE.—I do not think Mr. Row has at all succeeded in making out the case which he put before us; and I may add that the instances he has quoted are not in point, to my mind. You cannot arrive at a fair conclusion so long as you consider the actions of a dog or of any other animal in the direction of its instincts. It is only when you consider its acts in opposition to its instincts that you can arrive at any results. Here is a case which shows how blind an animal's instincts are. I quote from *Creation's Testimony to its God*, by the Rev. Thomas Ragg. He says,—

"The beaver likewise, when its building season arrives, unites with its fellows in the construction of a dam across the chosen river, and of a number of adjacent habitations, carrying on its operations in the exact manner in which the highest intelligence would have directed. Yet the beaver will exhibit its building instinct even in captivity, and in circumstances in which its labour could be of no possible use; thus showing that its operations are directed by a blind instinct inspired by an intelligence other than its own. A curious instance of this is related by Dr. Carpenter. One, half domesticated, in the possession of Mr. Broderip, began to build as soon as it was let out of its cage and materials placed in its way. Even when it was half grown it would drag along a large sweeping-brush or warming-pan, grasping the handle with its teeth, so that the load came over its shoulders, and would endeavour to lay this with other materials in the mode employed by the beaver when in a state of nature. The long and large materials were always taken first, and two of the longest were generally laid crosswise, with one of the ends of each touching the wall and the other ends projecting out into the room. The area formed by the cross brushes and the wall he would fill up with hand-brushes, rush baskets, books, boots, sticks, clothes, dried turf, or anything portable. As the work grew high, he supported himself upon his tail, which propped him up admirably, and he would often, after laying on one of his building materials, sit up over against it, appearing to consider his work."

I suppose that was in intellectual contemplation. (Laughter.)

"This pause was sometimes followed by changing the position of the materials, and sometimes it was left in its place. After he had piled up his material in one part of the room, for he generally chose the same place, he proceeded to wall up the space between the feet of a chest of drawers, which stood at a little distance from it, high enough on its legs to make the bottom a roof for him, using for this purpose dried turf and sticks, which he laid very even, and filling up the interstices with bits of coal, hay, cloth, or anything he could pick up. This last place he seemed to appropriate for his dwelling; the former work seemed intended for a dam. When he had walled up the space between the feet of the chest of drawers, he proceeded to carry in sticks, clothes, hay, cotton, &c., and to make a nest; and when he had done he would sit up under the drawers and comb himself with his hind feet."

Here is a clear and unmistakable instance of blind instinct, and I have no hesitation in saying that any of these facts, any of the cases mentioned by Mr. Row for instance, can be explained on the principle stated in the paper. Animals, I believe, have an utter incapacity for reasoning. To a certain extent animals may be taught certain things, but the moment you change the circumstances under which they have been instructed they fail utterly to make any allowance for that change of circumstances. To take another example, the author of this book, after speaking of rabbits and foxes, says,—

"Yet it is evident they do not know the character of the work they are engaged in, for experience could not have taught them. The butterfly or moth which deposits its eggs in the exact spot where the future grub will find its most suitable nourishment cannot know that it will be found when they want it, where most frequently it does not exist at the time the germ is laid there; for the flesh-fly, deceived by its sense of smelling, will lay its eggs in the petals of the carrion flower, whose odour so closely resembles that of tainted meat."

Here again is a total absence of reason. It is a case of mere instinct. The smell leads the insect to deposit its eggs in a certain place utterly unfit to receive them, and those eggs are therefore laid in a place completely unsuited to the purpose in view. Then, speaking of hens, the author goes on to say,—

"And yet are they endowed by instinct with some impression which teaches them to provide for the *natural* result; for a young hen of mine which made her first nest, a stray one, under a heap of coals, when the eggs were discovered and taken away during her absence, after she had sat upon them for a day or two, wandered about the coals calling the chickens."

Here again we have a specimen of defective observation and reasoning. The hen calls her chickens when there are really no chickens to call. The author continues,—

"Our domestic poultry, indeed, long as they have been under the tuition of man, will, to a close observer, exhibit, especially in early life, the stubbornness of natural instinct. Accustomed in their wild state to roost upon the branches of trees, they usually seek the highest roosting-place they can attain, even though a much more comfortable spot is provided for them below."

And the author mentions a case in which great care was taken to accommodate the chickens, but all to no purpose. A warm nest was provided for

them in a good situation low down near the ground; but the fowls would persist in roosting in a high place, and though this comfortable spot was prepared for them, they neglected it and roosted in another place high up and open to the air, where they perched daily in the cold, although it is notorious that fowls like warmth, and that it is absolutely essential for them. The author shortly afterwards goes on to say,—

"Thus it is, too, with unreasoning creatures, in regard to pairing, procreation, and every other instinctive proceeding. They *appear* to exercise mental power and discrimination, but that mental power and discrimination are not their own; for, with regard to all alike, it may be asserted that education has not taught, and experience has not convinced. Their operations, then, give evidence on every hand that the power which organized them, implanted in each organization such ideas as were necessary for its being, its happiness, and the preservation of its tribe. Their mechanism, whatever they construct, is more perfect in its way than man's. Yet, as far as the creatures themselves are concerned, it displays no power of contrivance and design. Perfect in itself for the purposes for which it was intended, and often surpassingly beautiful, it yet exhibits no acquaintance with the principles of symmetry or beauty in its constructor, because that constructor only blindly carries out one implanted idea. Each displays what *appears* to be mental power in one particular manner only, each being only enabled to execute one design, though he executes that one with a perfection to which man cannot attain. Thus instinct is 'involuntary,' and not governed by *will*. Its limits are fixed, and whatever may be the condition of the animal, it cannot travel out of them. From age to age, under every variety of circumstances, it preserves the same beaten path, and never either retrogrades or advances. It is an unerring guide, but it is a blind one."

Then here is a very interesting case from Blumenbach with regard to an animal which we are told is in some degree related to man:—

"Thus Blumenbach's ape, having got hold of a large work on insects, turned over the leaves with a very studious air, but he pinched out all the painted beetles and ate them, mistaking the pictures for real insects. His taste and touch did not serve to detect the deception of his eye, while under the excitement of appetite produced by the image of a thing which he naturally relished."

I think this really contains the whole point which is involved. Unless you take the animal under circumstances which do not involve the operation of his instinctive habits, unless you call upon him to perform some operations which are not in the direct ordinary line of his instinct, you cannot really estimate whether he is influenced in what he is doing by reason or not. I, therefore, do not think that the cases mentioned by Mr. Row bear upon the point at all. One of the great distinctions between man and the lower animals is language. Man has the power, which no animal possesses, of conveying an embodiment of his ideas by symbols to other men. That distinction really involves intellect to my mind, and short of that it seems to me that there is no intellect at all. (Hear, hear.)

Mr. Reddie.—It is perhaps unfortunate that Mr. Morshead's language has not been more definite, but I do not think he is quite open to some of the criticisms which have been passed upon him. Although he has used the phrases "intellect" and "instinct," and put them in antithesis, I don't think

he meant by intellect what Mr. Row considered he did. Indeed, it seems to me impossible that he could have done so, and I do not think that what Mr. Row has defined as intellect is exactly intellect after all. With regard, for instance, to the case of the chamois judging of the breadth of a chasm, my impression is that the chamois judges probably just as a man would. A man would judge of such a matter on the spur of the moment, entirely by that sort of instinct which he and the chamois both have, and there would be no intellectual process in the case at all. There is no doubt at all in regard to the fact stated by Professor MacDonald as to many admirable ships having been laid down by ship-architects who have been without that mathematical training which is considered so essential in naval architecture. The lines of those ships have been devised in the architect's eye by a kind of instinct, and very remarkable results have been produced. I know that the distinguished mathematician Professor Oliver Byrne, a member of this Institute, was associated with a man in America who turned out some admirable ships by rule of thumb, and who could not design from calculations. Professor Byrne had to give him the mathematical elements in the construction of those ships which he thus devised entirely by a kind of instinct. It has been said that a dog barks when he is afraid. Now, on that point I have arrived at a different conclusion, and my impression is that a dog barks most when he is least afraid! I have often seen a dog barking at a man who was strange to it; but if, under such circumstances, you show a good front, the dog leaves off barking, turns away, and, in all probability, howls. You convert his first impressions with regard to you into a positive panic. On the point that memory influences animals with regard to their instincts there can be no doubt whatever. It is unquestionable that when men first go to an uninhabited island, the birds and animals, unused to the presence of human beings among them, allow themselves to be approached without the slightest fear, and the habit which they acquire of making off at the approach of man seems to be the result of experience, or of an inherited memory becoming an instinct. They certainly do not always wait to ascertain the destructive properties of the weapons used against them; for if birds did not fly away from a gun *until* they were shot, they would never have the chance of flying away at all. (Laughter.) I cannot agree with Mr. Row on another point. His experience and mine differ with regard to the pointing of a stick at a bird; for I have often seen a whole colony of crows and other birds put to flight by having an umbrella or a stick levelled at them. I have, however, heard before what Mr. Row has stated, that birds will fly away from a gun, but not from a stick; and I have heard this explanation given—that the birds by experience have learnt the smell of gunpowder, and the danger to them with which it is associated. But, to leave these small details, which do not invalidate the general arguments of our author, I do not think Mr. Morshead has given us a sufficient indication or definition of what is the distinctive difference between that kind of intellectual power which is called instinct, and that other kind of intellectual power which we call intellect alone. I suppose that Mr. Morshead's view is, that instinct is a kind of

very rough reasoning—a kind of reasoning the processes of which we cannot follow, but which is certainly intellectual so far as it goes. Certainly the paper before us does not deny that view in strictness of language, because Mr. Morshead speaks of the distinction between the psychology of man and the psychology of the lower animals being the classification of two very different mental operations. One of the quotations read by Captain Fishbourne very nearly hit the matter on the head, but did not quite work it out. An animal has its instincts limited to a very small circle of actions; and it is of little consequence to us whether or not there is a kind of reasoning associated with those instinctive operations, if we establish the fact that those operations do not travel beyond a certain limit. You find, for instance, that a bee performs marvellous things, and so does the spider; but you never see the bee attempting anything like the work of the spider, or the spider attempting anything like the work of the bee. The bee does marvellous work in its own line, far transcending the work of the human intellect in a similar direction; thus furnishing abundant testimony to the existence of that Supreme Intellect which has furnished it with the means of working so well. Take any bird you like—say a blackbird or a thrush—and you find that each builds its nest in a way peculiar to itself. Or take a beaver, and you find that it has a wonderful power in its own particular line of work which man does not possess, because man has to acquire all his arts gradually, but the animals are born with theirs. We possess that most perfect and complete gift of an intellect, which the animal has not; and yet the lower animals can perform work which it is beyond our power to imitate or to analyze. This subject might further be followed out, and we might well have another very interesting paper upon it. I recollect, when a paper by Mr. Pike was discussed in the Anthropological Society, that Mr. Wallace mentioned the case of a fish having a piece of pork presented to it over the side of a boat; and he proceeded to say that that fish went to the other fishes, and communicated to them the intelligence that they also might possibly be fed with pork if they followed the boat. (Laughter.) But it was ingeniously urged in reply, that the first fish, after swallowing the pork, had returned to its companions, and that they had been informed of what it had eaten simply by the smell of the pork, and that so in turn they made their way to the boat. And now I should like for a moment to defend the commencement of Mr. Morshead's paper, the accuracy of which has been impugned by Professor MacDonald, because I think it is very important in such papers to have the beginning well and accurately laid down. Mr. Morshead states that, *physically*, man, although superior to the lower animals, is neither more nor less than an animal; and in controverting that I think Professor MacDonald is both wrong and unorthodox in his views, because Solomon has told us that there are certain things which we ought to consider for the express purpose of knowing that we are but animals ourselves. Shakespeare, again, speaks of man as "a worm—a god," putting the phrase in the mouth of Hamlet; and that corresponds with the expression of the patriarch Job, who also calls man a worm. In regard to all those things

which belong merely to our "physical organization," or bodies, we are certainly no other than animals; and I would go further, and say that, in some respects, we are no better even than the invertebrate animals. The invertebrate animals are as good as we in regard to their eating and drinking, living and dying; but that does not invalidate the superiority of man in other respects. Of course I am not prepared to agree with Professor MacDonald on another point. I cannot agree, or at least I do not think it is an argument which we can at all use, that man is the only animal having any idea of infinity. We do not know, and have no means of knowing, whether the inferior animals have any idea of infinity or not; and I am not very sure, on the other hand, whether men generally have any full idea of it either. That case quoted by Captain Fishbourne of the monkey which pinched the beetles out of the book and ate them shows how very poor the animal intellect is, and there are better instances even than that. Gorillas in the African forests will watch the traveller as he passes through them, and see him sit at the fire he has made, and warm himself; and after he has passed on, they will also sit round the fire, stretch out their legs, and warm themselves like tho man; but they have not the common sense—and that is really the exact expression for what they want—they have not the common sense to put on a single stick to keep the fire alive! That alone shows what an immense intellectual difference there is between a man and a brute. We cannot deny, and I do not think Mr. Morshead means to deny, that there is a certain amount of ratiocinative power in the animal; but there is a difficulty about Mr. Morshead's definition, perhaps, which laid him open to some of the criticisms of Mr. Row.

Rev. S. WAINWRIGHT.—I think Mr. Reddie has shown—what, indeed, is self-evident, and what I am prepared to maintain, in the face of the *Saturday Review*, and of the whole school of those who oppose us—that we cannot possibly have a true solution of the matters which surround this subject on every side, except by adopting that which, until it is put out of court by a positive refutation, has an unanswerable claim to be considered the absolute truth. Mr. Morshead has pointed out that, viewed on one side of his being, man is only an animal; but there is another side of his being, in respect of which he is not an animal; and the whole man is that complete being so fearfully and wonderfully made that there is plenty of room for him to wander up and down within himself, and in himself be lost. I cannot agree with the view held by Mr. Row, that animals have an intellect of the same kind as, and merely differing in degree from, that of man. The difference is one not only of extent and degree, but of kind. The intellectual power of the animal, if you like to call it so, is *sui generis:* it has nothing in common with the human intellect. Mr. Row linked several of his facts together with a copula very much in favour with Mr. Darwin and others of his school when they declare that so-and-so *must* be so-and-so, and *must* have such-and-such an effect. Though I am a clergyman, I confess I am of a somewhat sceptical turn of mind when I come across that phrase; and, until I have seen a reason for it, I never admit a "must." I am bound to say

that I have not seen the reason for it here. Mr. Row gave us one or two anecdotes of dogs, but it appeared to me that every one of the instances he gave us could be satisfactorily accounted for by the simple association of ideas.

Mr. Row.—Surely that is intellectual?

Mr. WAINWRIGHT.—That association of ideas is sufficiently dealt with by Mr. Morshead in the passage which follows the reference to the parrot declining to crack a hollow nut. He altogether repudiates the idea of going by syllogistic threes. He says,—

"Every action, whether of man or of brute, *may* be regarded as the result of a syllogistic process. But a syllogism is merely the artificial imitation of a natural process; it is a logical instrument, contrived for the purpose of demonstrating that which was not previously evident to the perception. It is a proof that man has the power of contemplating the operations of his own mind, a power which the brute does not possess, so far as is shown by any evidence to the contrary; and this self-consciousness is very different from the consciousness of physical individuality with which Mr. Pike endeavours to confuse it. To state the case in other words, the lightness of the nut conveys to the parrot the impression of worthlessness; the necessary factors of the psychological operation which precede the rejection of the nut are nothing more than memory, which is an involuntary agent, and feeling or instinct."

An expression used by Captain Fishbourne gives us the key to the whole matter. He has spoken of the "blind instinct" of the animal. We find an authentic statement, the evidence of which has never yet been put out of court, and that statement tells us that the difference between the animal called man and the other animals is in—call it spirit if you will—in the spirit, which has nothing earthly about it, or naturally sinking—that spirit of man which goeth upward. There is in man the breath of the Almighty, which gives him understanding; and that I take to be the only possible solution of the matter. Mr. Row has given us anecdotes of dogs. Now, I have seen performing birds, which did most wonderful things; but surely Mr. Row would not say that they were guided in what they did by reason. They were taught to climb up sticks, to draw a small carriage about, and to go through a variety of performances. I have also seen a performing horse—

Mr. REDDIE.—And there are even performing fleas, you know. (Laughter.)

Mr. WAINWRIGHT.—Yes, but I never watched them, I am happy to say. The performing horse I saw do a variety of things, and it was made to indicate the day of the week, and do other feats of that description; but in all that it did, it obeyed some signal from its master, either in what he did or in the inflection of his voice when he spoke. The whole performance, so far as the horse was concerned, was simply and purely the result of the association of ideas—

The CHAIRMAN.—But if you grant the association of ideas, does not that imply intelligence? Can you have the association of ideas without intelligence?

Mr. WAINWRIGHT.—Well, I have not yet heard any definition of what you mean by intelligence. I hold that you can have the association of ideas apart from human intelligence—

The CHAIRMAN.—It is the difficulty of the paper before us, if I understand it rightly, that that amount of intelligence is not admitted.

Captain FISHBOURNE.—I think the paper does admit it in the case of the parrot and the nut.

Mr. WAINWRIGHT.—You see we cannot give distinctive names to these operations in the νοῦς of the bird. I take them to be nothing else than the operations of a certain spirit, if I may use the term, without, of course, meaning that immaterial and immortal spirit which we possess. I make very much of what was said by Professor MacDonald as to man being the only created being who has the power of making offensive and defensive weapons. That is a great point of difference between man and the lower animals. Then, again, man has the power of using spoken language. There has been a sort of attempt to place the cawing of a rook on a level with—what shall I say?—the eloquence of Chatham: but surely there is a great difference in the sounds which issue from a rookery and the eloquence of the forum. If you say that animals have reason and language, you must grant them ideas suitable to their mental condition; but you would hardly expect them to write histories and epics which should rival the works of Herodotus, Milton, and Homer. Mr. Morshead says that the Andaman Islanders, the Bushmen and Veddahs, have always a natural consciousness of the distinction between good and evil, although their notions of what is good and what is evil may not coincide with ours. But I think there is a distinction between men and brutes which far transcends that in importance. Brutes have been taught to do the most unheard-of things, but there is one faculty which they have never yet been found to possess, and which is never wanting in man, however low or degraded he may be:—the brute has no capacity for veneration and worship. You may teach a dog to hold its paws together, bow its head, and remain still for five minutes as if at its prayers; but you never will succeed in eliciting any little fragment of conduct from it which shall so far impose on you as to make you think the dog has acquired the least atom of your idea of worship. If you say there are some exceptions among humanity, and that some races of people have been found who do not worship, then I say that those exceptions have never been authenticated, and I am not convinced. All men pay some sort of veneration and worship to the Supreme Being to whom worship is due: it may be blind, bloody, cruel, violent, as you like, but still it is a form of worship proceeding from the idea that there is a Power to whom they owe protection, and whom they must propitiate. But assuming for the moment that the Andaman Islanders have no knowledge of a God, I put it to you whether the fact that they have become so degraded as to be outside the pale of humanity does not establish my position, that the knowledge and worship of God not only belongs to the human race, but belongs peculiarly to them, and is not to be found among the lower animals? Truly I think all research and inquiry go to prove that of man alone it can be said that there is a spirit in him, and the breath of the Almighty hath given him understanding.

The CHAIRMAN.—I do not think Mr. Morshead's paper has been so

satisfactory in its definitions as it might have been, and if it had been a little more definite a great deal of misconception would have been avoided. We all have, in the rough, general ideas of what we mean by intellect, reason, and instinct; and I know it is difficult to give definitions which satisfactorily comprehend the distinctions between the three terms. Paley's definition of instinct, given in Mr. Morshead's paper, that it is "a propensity prior to experience and independent of instruction," is an excellent one, which we always use; but in reasoning upon this subject we must be careful to bear in mind that man himself possesses instinct, frequently—nay, constantly—acts upon it, and sometimes finds himself in a difficulty in which he cannot distinguish the source of his own acts—whether they have been instinctive or the result of reason. There have been a vast number of very curious phenomena deduced from nature concerning the habits of the lower animals, and particularly of the invertebrate animals; for there we are met with the most astonishing results of instinct, many of which appear to be the work of reason, but which may really be traced up to the certain action of instinct. Take the case mentioned by Mr. Row of the bees which took possession of an empty hive in his garden. Now, at first sight that does appear to be the result of considerable intelligence, but it is really attributable to the natural instinct of the bee. Those who have observed bees carefully know that they never swarm until they have found a suitable habitation; for they would be destroyed by a heavy shower of rain, and they therefore send forth scouts to secure a good habitation, and do not swarm unless the weather is favourable, and until their future home is provided for them. That, therefore, may be referred to instinct. But there is another very peculiar fact about them, which may be referred to what we may term latent instinct. I am speaking now of the ordinary hive bees; for it must be borne in mind that there are in this country something like 250 different species of bees, all having different instincts and habits. In the case of the hive bees, at a certain specified time, when they know that preparations must be made for the eggs of the future queens, they construct cells for them of a character totally different from and much larger than their ordinary cells. But if the queen dies, and you take away the cells containing the eggs of the future queens, what do they do? They know instinctively—for that must be instinctive which they cannot have learnt from experience—what is the right thing to do at once in order to provide a new queen. They destroy the partitions between a certain number of ordinary cells, so as to make one large queen's cell, and the grub of an ordinary bee is placed in it and treated with a different kind of food from the rest until it is absolutely developed into a queen, though under ordinary circumstances it would have been a wax-maker or a neuter. Another remarkable fact about bees may be referred to instinct. The death's-head moth is very destructive to the bees, if it can once manage to get within the hive, and it attracts the bees by emitting a peculiar sound like that which the queen bee emits in the hive. If the moth gets within the hive and makes that sound, it paralyzes all the bees, and they are completely at its mercy. Now, the death's-head moth is generally an exceedingly scarce

moth ; but in those seasons when it is abundant—and I am following Kirby and Spence in the relation of this fact—the bees construct defences at the entrance to the hive, making the entrance too narrow for the moth to penetrate, but still capable of admitting all the bees themselves. These things are the results of instinct; but if we do admit a low degree of intellect in the case of the inferior animals—and that is all that is required—we shall not at all trench on the higher points of man's nature, for we should only be admitting that which has been spoken of as animal intelligence—that which Mr. Wainwright referred to under the phrase "association of ideas," but which after all is something more than mere memory. As an instance of what I mean, let me take a case at random. Take the case of a wasp which has attacked and killed a fly. He finds he cannot take it away bodily as it is, so he first takes off one wing and then another, and so on, removing the carcase piecemeal—

Mr. REDDIE.—I do not see how so light a thing as a fly's wing would be sufficient to interfere with the successful carrying away of the whole body.

The CHAIRMAN.—If the wasp were to endeavour to carry a fly with its wings upon it through any wind, it would be one of the most difficult things for it to accomplish—

Mr. REDDIE.—But how could you tell that the wings had not been "fumbled" off the fly's body, and not taken off purposely at all?

The CHAIRMAN.—Because in such a case the wings show marks of excision by means of the wasp's jaws. We should be careful to give sufficient allowance in our definitions, so as not to contradict that which is according to nature, and I think Mr. Morshead has scarcely done that. I am rather led myself by a valuable observation of Coleridge in his *Aids to Reflection*, in which he feels so strongly the force of the fact detailed by Hubert and other authorities with regard to the bee and the ant, and in which he states that the great distinction between man and the inferior animals is found in the possession by man of what you would call the religious faculty—of reason, not using the term in the sense of mere intelligence, but meaning by it the highest faculty which man possesses. He admits that, besides instinct, animals possess intelligence, but not reason, according to his definition of it. We are so accustomed, however, to use the terms "reason" and "intelligence" as synonymous, that it will perhaps be better if instead of using the word "reason" here, we substitute for it "religious instinct," although that is an unfortunate phrase in many respects. By the way, how very deficient we find language is when we want to express these subtle differences! If we accept that definition, I think Mr. Row and Mr. Wainwright and the rest of us would all be brought into complete accord upon the subject. There is a certain unfortunate vagueness about some parts of Mr. Morshead's paper ; for it does seem to admit in one place a certain degree of intelligence in animals, and yet it seems to deny it in another. I think the terms "instinct" and "memory" are not sufficient to account for all that has been done by animals. Animals have an intelligence—

infinitely below man's, of course, and incapable of being educated up to any proximity to human intelligence; but still it is a very different thing from instinct. Pure instinct is in its way as perfect as the highest powers of man's intelligence. Indeed, the cell of the bee and the web of the spider, so constructed as to be adapted for the weather of several days in advance, are infinitely more perfect than anything produced by human reason: they are perfect in themselves and incapable of improvement. But beyond this instinct, which man shares with animals, though in a much less degree, they have some amount of intelligence, not of the same high quality as man's. But the manifestation of this intelligence is not found increasing from the lower grades of animals up to the higher in proportion to their physical development: the fact is rather the reverse of this. We do not go to baboons or apes for the highest degree of animal intelligence. We find probably the highest degree of intelligence in vertebrate animals in the dog. In the same way the brains and the intelligence of the elephantine creatures are very small indeed in proportion to the size of their bodies. But if we want to beat the intelligence of the dog we have to go to the invertebrate creation, and we find it in the ant and the bee, and in many of the insect tribes, developed to its highest extent. There is the agricultural ant, for instance, which cleanses the land of weeds, sows the seed, reaps it when ripe, stores it up for use, and when it begins to sprout from moisture, it brings it out into the sun, dries it, and carefully rejects the spoilt grain not worth drying. These acts indicate so much of intelligent power that we must admit the existence of something more than instinct in the case.

Captain FISHBOURNE.—I hold that that is a case of instinct. A man in such a case would not be able to discover that the seed had lost its germinating principle. The insect does discover it, but by instinct, not by reason.

The CHAIRMAN.—I do not think you can carry it so far as that.

Professor MACDONALD.—Stupid as men are, they are able to perceive when the grain is spoilt.

The CHAIRMAN.—I think this shows that the subject is by no means exhausted, and it would be interesting to renew it at some future time.

The meeting was then adjourned.