

The Physiology of Mind in the Lower Animals. By W. LAUDER LINDSAY, M.D., F.R.S.E., Physician to the Murray Royal Institution [for the Insane], Perth.

“In *all* departments of investigation, it is right to *commence* with the study of that which is most common, *simple*, and regular: and thence to proceed to inquiries respecting that which is unusual and irregular.”

*Bucknill and Tuke.**

“It is a step in advance in *every* science to *simplify* questions, by introducing into the study of the most complicated facts the knowledge derived from an order of facts simpler in their character and better understood. It is thus that Mathematics have rendered the greatest possible service to Physics, Physics to Chemistry, and these two sciences to Physiology.”

Claude Bernard.†

“In *all* sciences the *errors* precede the truths; and it is better they should go first than last.”

Horace Walpole.

I. Introduction.

It has come to be a recognised axiom in science that the study of the *simple* should precede that of the complex: that a knowledge of what is easy, should be the basis of an investigation of what is difficult of comprehension. It has also come to be fully admitted in medicine that a thorough acquaintance with form, structure, function, even disease, in the *Lower Animals*, is of the utmost importance in the study of the morphology, anatomy, histology, physiology, and pathology,‡ of *Man*. There can now be no doubt of the important light that has been shed on zoological science by the study of the simple cell and its gradual development into complex tissues; of the ovum and its evolution into the different forms of animal life; of the skeleton in the lower animals as compared with man. So far from *human* anatomy, histology, physiology, or pathology, occupying the exclusive attention of the most advanced students in medicine, these

* “Manual of Psychological Medicine,” 1858.

† “Lectures on Comparative Pathology:” “Medical Times,” Jany. 7, 1860, p. 5.

‡ I fully illustrated this proposition, so far as regards *Pathology*, in a paper published in 1858—“On the Transmission of Disease between Man and the Lower Animals,”—in the “Edinburgh Veterinary Review and Annals of Comparative Pathology.”

important departments of biological knowledge now constitute mere sections of the grand sciences of *comparative anatomy*, *histology*, *physiology*, and *pathology*, which relate to the knowledge of structure, form, function, and disease in the whole animal kingdom; and point out, on the one hand, the bearings of our acquirements in human medicine on veterinary science, and, on the other, the relations of the Natural History of the Lower Animals—in disease as well as in health—to human medicine and our knowledge of Man. There is, moreover, an important department of comparative physiology and pathology which is *experimental*: which has already yielded results* of the highest interest to the physician; and which promises to yield results* of still greater value in proportion as experimental physiology and pathology are cultivated in this country.

Comparative Psychology, however—the Science of Mind in all classes of Animals, including Man, and in the lower animals specially as contrasted with Man—is almost entirely unknown and unstudied in this country. And yet there is no department of the wide and perplexing domain of psychology that offers to the student so much that is at once novel and important as the study of *Mind in the Lower Animals*, both in its normal and abnormal states—its conditions of health and disease—its physiology and pathology. It is from *this* direction, it appears to me, that we must look for material additions to, or improvements of, our knowledge of the phenomena of healthy and diseased mental action in Man. Moreover, I can see no reason why the principle of *experiment* should not be applied to the investigation of the phenomena of Mind in the lower animals, just as it is applied to the study of other functions or phenomena. Experimental investigation on the lower animals has already been productive of contributions* of the highest value to our knowledge of diseased or disordered function in Man; and I have no reason to believe that the function of the brain—mentalization or cerebration—forms an exception to the general rule. At all events, I venture to recommend the subject to the most earnest consideration of students in physiology and pathology, having the strongest conviction that the results of *experimental investigation of the phenomena of Mind in the Lower*

* They are referred to in the author's Papers entitled—

(a) "Experiments on the Communicability of Cholera to the Lower Animals:" "Edin. Medical and Surgical Journal," 1854.

(b) "Choleraization:" "Lancet," vol. ii. for 1866, p. 600.

Animals—and especially in those of the domestic animals, which most closely resemble man in structure and habits—cannot fail to yield fruits of the most important kind alike to veterinary and medical science.

Hitherto physicians and metaphysicians, philosophers and writers of all kinds, in studying Mind—if, indeed, many of them have really *studied* it at all, and have not simply given the rein to their prejudices, availing themselves of such second hand information as suited their respective theories or fancies—have confined themselves to its phenomena as exhibited in *man*. They have devoted themselves to an analysis of the *most complex form of mind*; and have not brought to bear on so intricate a study the important knowledge that might have been derived from an investigation of its simplest phases in the lower animals. Among other results of so restricted a study or knowledge, are the belief at the present day by many highly educated men, that the lower animals do not possess mind at all; all their mental phenomena being attributed to the operations of the convenient faculty termed *instinct*. The inter-relations of instinct and reason are thoroughly misunderstood; arbitrary and mischievous distinctions are maintained between man and his fellow animals, some of whom* are, nevertheless, in certain respects, infinitely *his* superiors; and the utmost diversity of opinion exists, even among the most accomplished psychologists, as to the constitution of mind, no two authors agreeing in regard to the number, names, or characters, of its fundamental “faculties.” In order to the substitution of a better state of matters, we must, I believe, first become ashamed alike of our ignorance and prejudice; unlearn much that we have already learned in human psychology; and begin our studies on mind with its genesis or rudiments in the simplest forms of animals, tracing its gradual progress from simplicity to complexity. Among other errors of which we must rid ourselves, we must be prepared, *ab initio*, in our studies, to cast aside the erroneous assumption that “intellectual power depends altogether on

* It seems to me not only legitimate, but proper, to use what are called “personal” pronouns, in speaking of certain, at least, of the lower animals; to employ he or she, his or her, who, whose, whom, instead of it, its, which. “Are not these dumb friends of ours *persons* rather than things?” asks Dr. John Brown (p. 115); and I have little doubt that Sir Walter Scott, who, as his biographer Gilfillan tells us, “had lived much with the lower animals . . . and learned to understand their habits, and had entered further than most men do into their natures,” regarded the dog at least in this light, as Byron and many other distinguished authors have done, both before and since his time.

the brain;* whereas the *brain* is only *one* condition out of many on which intellectual manifestations depend; the others being chiefly the organs of the *senses*, and the *motor* apparatuses, especially those which are concerned in *prehension*, and in the production of articulate *speech*.”† To renounce the belief that mind is confined to brain; to admit that, in a sense, mind may be said to pervade the animal organism, or that at least, its development is partly dependent on other organs than the brain, is to give up opinions that have long been orthodox among all civilised nations. But such renunciation must extend to many other items of current belief; the student will be compelled to admit that instinct and reason differ only *in degree*; that both instinct and reason are to be found in man in common with other animals: that many animals feel, observe, reflect, judge, just as we do; and that in respect of morals—of disposition and character—many of them are infinitely *our* superiors. In truth, the researches of the student, who brings to the investigation an earnest love of truth, a freedom from prejudice, and the other qualities necessary in so difficult an inquiry, can scarcely fail to upset many opinions that are generally received throughout the world, and that constitute therefore man’s present orthodox belief in matters psychological; while they will establish on a firm and solid basis many views that are at present regarded as not only utterly heterodox and revolutionary, but even as subversive of religion and repugnant to common sense! What some at least of these heterodox opinions are will appear in the sequel. Meanwhile, it may be desirable to fortify my own conclusions by the opinions of certain authorities, whose names are sufficient to give weight or value to all they may have to say on any subject which they have carefully studied.

Lord Brougham, whose remarks on the relations of instinct to reason are admirable, thus writes:—“Naturalists, who could throw so much light upon” [the subject of animal reason] “confine themselves chiefly to the structure and functions of the organs, and leave the *mental* part of the subject out of view. Yet a physiologist, who also applied himself to this latter branch of the inquiry, would be the person best qualified to grapple with its difficulties and to throw light upon it” (p. 274). Unquestionably the accomplished physiologist is most competent to deal with the investigation—by experi-

* Goodsir points out the development of mental activity without brain (p. 366).

† Huxley (p. 102).

ment or otherwise—of the phenomena of mind in the lower animals. But such an investigation is so comprehensive and important, that it should not be restricted to the naturalist and physiologist. The physician and veterinarian, the psychologist and metaphysician—all persons of intelligence who have opportunity of studying the habits of animals—may with advantage share in the inquiry, and can furnish *facts*, whose value would be appreciated by the skilled investigator.

Professor Goodsir, with whose conclusions on the respective essentials of humanity and animality my own conclusions are mostly at variance, and who regards the mind of man as “an intelligence altogether *different in kind* from the *instinctively co-ordinated* intelligence of the brute” (p. 316), nevertheless admits that “We may . . . reasonably expect, by the careful investigation of the habits and actions of animals, to derive much important psychological knowledge. Such knowledge will ultimately assume the form of a sub-science—*comparative psychology*” (p. 308). Here I entirely agree with him, though I think he might safely have put the case much more strongly. The foundation in London of an “Institute of Comparative Pathology,” under the Brown bequest, will probably give an impetus—unprecedented in this country—to the study of disordered functions and organs in the lower animals; and I have little doubt its directors will see the importance of including among the investigations deserving of immediate attention the subject of *mentalization in animals*, both in health and disease.

In an admirable summary of the relations of animal instinct to human reason, a recent compiler thus represents most truthfully the present state of our knowledge of mind in the lower animals:—“The mental system of the lower animals is much less perfectly understood” [than that of man]; “and no sufficient observations exist to enable us to draw clearly the line between the *intuitive* and the *acquired* powers in any single species. The popular tendency has been to *underrate* the *acquired* knowledge of animals, if not to ignore it altogether. . . . At present we are not in a condition to dogmatise, owing to the want of proper observations in the whole department of brute intelligence.”* Just, however, as it is desirable to study fully the *acquired mental powers of animals*, it is equally so to investigate thoroughly the subject of *instinct in man*; for, as the same writer remarks, “In point

* Article *Instinct*: “Chambers’ Encyclopædia,” vol. v, 1863, p. 598.

of fact, men and animals alike possess both instincts and acquisitions.”* Hitherto, however, there has been no satisfactory treatment of either subject—whether in works of mental philosophy or natural history—of human medicine or veterinary science.

During the last two years I have myself been studying the subject of Mind in the Lower Animals, both in its normal and diseased conditions. The result has been a growing conviction on the one hand of the extent of our ignorance thereof and prejudice thereanent; and on the other, of the importance of a knowledge of its phenomena in relation to the *physiology and pathology of mind in man*. In the first place I, have read carefully a large number of the best class of works—both old and new—that treat generally of the habits of animals, or more specially of their instinct and intelligence, so-called. From these works, as well as from magazine and newspaper reviews thereof, I have collected a large quantity of material, illustrating the mental phenomena of the lower animals. In the second place, I perused the various definitions, analyses, or classifications of the human mind, or its faculties, to be found in our standard works of mental and moral philosophy, of metaphysics, psychology, and phrenology, carefully correlating—or at least attempting to correlate—the attributes of *mind* in man with the phenomena hitherto ascribed to *instinct* in other animals.

My results are so opposed to current opinion, and the whole subject is at once so novel, comprehensive, and important—not only in itself, but in its bearings on our knowledge of mind in man—that I venture to detail certain of my conclusions, in the hope that they may attract the attention of those who are more conversant than myself with such studies—are more competent to investigate psychological subjects, and have fuller opportunities for research, and more time for the exposition (by publication) of its results.

The immediate object of my study of mind in the lower animals, was to compare its *pathology* with that of the human mind, especially in reference to the inquiry whether other animals equally with man are subject to true *insanity*. I do not, therefore, profess to have gone at all exhaustively into the *physiology* of mind in the lower animals. I collected only sufficient materials to enable me to indicate the *kind*, or quality, of mind possessed by the lower animals as compared with man :

* Article *Instinct* : “Chambers’ Encyclopædia,” p. 597.

to set forth the general *resemblances* of the animal to the human mind. To treat the physiology of mind in animals adequately to its surpassing interest and importance, would require a lengthy and elaborate treatise. The subject is one which would, however, I believe, fully repay all the labour bestowed on it; and I trust that some competent authority, such as Bain or Maudsley, or still better, that both metaphysicians and physiologists, veterinarians and physicians, will forthwith appropriate it and give their best energies to its investigation.

The main object of my present paper is to lay down a basis for a subsequent essay on the *pathology* of mind in the lower animals. For such a purpose it is sufficient to indicate those qualities in other animals, which are in man attributed to mind, and which equally in other animals and man are liable to a derangement constituting *insanity*. It is, therefore, neither necessary nor desirable that I should enter at present on the extremely difficult—and, perhaps, insoluble—problems of (1) soul, spirit, or conscience in animals; that I should discuss (2) the relation of mind to size of brain or head, whether in man or animals; (3) the subtle distinction—if any really exists—between instinct and reason; or (4) the specific or essential *differences* of a psychical or mental kind that exist between man and other animals—between *animality* and *humanity*.

It would be utterly impossible within the narrow limits of a magazine article to cite *anecdotes*,* or cases illustrative of the mental phenomena or attributes about to be enumerated. Nor is such citation necessary, seeing that illustrations of the operations of mind in the lower animals can be found in abundance in the many excellent works that treat of their habits, instinct, or intelligence; some of the best of which I have deemed it desirable to enumerate as a bibliographical appendix to my present paper. Those who are interested in the subject will moreover find constant records—frequently of quite an authentic and trustworthy kind—in the public prints, illustrative of the mental endowments of animals; from which records, indeed, it is, in great measure, that the compilers of attractive popular treatises on the habits of animals draw their stores of information.

I had originally intended to analyse and arrange the mental

* Such anecdotes—more especially relating to the *dog*—are, nevertheless, “worthy of all the consideration which they can receive from the most philosophic mind.” (“Chambers Encyclopædia :” Art. *Dog*.)

attributes of animals according to some one of the best modern classifications or definitions of the *human mind* or its faculties. But I very soon found that this was undesirable, if not impracticable, by reason of the non-existence of any classification or definition that I can consider in all respects suitable or satisfactory. In all the natural sciences the classification and nomenclature of systematists are mere artificial or arbitrary contrivances to facilitate study by arrangements of *convenience*. The classifier perpetually violates that *law of continuity*, which pervades all nature and its phenomena; he draws rigid lines of demarcation where nature has links of connection, gradational changes, passage forms; he attempts clumsily and futilely to improve upon nature, making square, so as to dovetail into his theories, facts or phenomena which are naturally round. It is not surprising then that, applying his systems or methods to the analysis and arrangement of the very complex phenomena of mind, his classifications and definitions should abound in error, defect, or confusion. It is, indeed, highly improbable that we shall ever be in position simply, intelligibly, and at the same time scientifically, to define and classify the phenomena of mind. At all events, we are not in a position to do so at present; and it will only be when mind is studied in its most comprehensive aspect—not as confined to man, but as exhibited in the whole animal series, from its small beginnings up to its highest development—that the necessary data will be collected for generalising and classifying in the spirit of modern science.

According to ideas current among our most eminent writers on psychological science, mind consists of *emotion*, *volition*, and *intellect*. But *instinct* and the *senses* are so intimately related to, that it is impossible to dissociate them from, Mind.* There can be no doubt that much of what is assigned to *instinct* in the lower animals is really ascribable to *mind*, as it exists in man: while much of what is denominated mind in man is attributable to instinct, as it exists in animals. There is, in short, the strongest ground for the belief, on the part of several eminent modern authorities, that instinct and reason pass into each other by imperceptible gradations, and that they differ from each other *only in degree*.† M. Taine, one of the

* Professor Aitken, in his "Science and Practice of Medicine" (4th ed. : 1866), very properly, as I think, associates *instinct and sensation* with volition, emotion, and reasoning as *mental* qualities.

† "Reason is but a higher development of instinct," says A. W. Bennett, F.L.S., in "Nature," Novem. 10, 1870. "Whether it be instinct or reason, is

most recent writers on Intelligence, traces to our *senses* every source of knowledge. Leroy, too, says that "*Sensations* furnish the raw material of our ideas" (p. 138). Combe includes the "*external senses*" (touch, taste, smell, hearing, and sight) under the "*intellectual faculties*." Maudsley points out that *sensation* passes gradually into *emotion*; and that *intelligence* arises out of sensation in the process of mental development. Even in the writings of metaphysicians, psychologists, and phrenologists, there is the utmost diversity of opinion regarding the constitution or definition of *emotion*, *volition*, and *intellect*. Each term is used, sometimes in a comprehensive, sometimes in a restricted, sense. *Emotion*, for instance, may be held to include feelings, passions, sentiments, affections, propensities, appetites, impulses, instincts, pleasures, and pains; while some authors—such as Reid—assign appetites, passions, and affections to the *will*. Again, "*thought* without *will* is, we believe, a contradiction in terms. . . . Thought implies will or attention. . . . No such thing is even conceivable as thought absolutely without will."* *Attention* is an act of will; and *memory* usually involves a good deal of attention. *Will*, according to Combe, is merely "a peculiar kind or mode of action of the intellectual faculties" (vol. ii., p. 195). . . . "I consider intellect," says he, "as essentially constituting will" (vol. ii., p. 196). *Memory* again is "merely a mode of action of the knowing and reflecting faculties." "The *passions* are as different as the faculties" (vol. ii., p. 260). Hume includes hope and fear among the *passions*;† and regards joy and grief as merely mixtures of hope and fear. Combe, on the other hand, speaks of fear as an *emotion*. *Pleasure and pain* "are affections of every faculty;" they are "the result and not the cause of the particular faculties" (Combe). According to Maudsley, *sensation*, *perception*, *emotion*, and *volition* are essentially the same kind of *feeling*.‡ Different writers attach the most opposite meanings to such terms as moral sentiments; higher or lower sentiments; animal propensities, affections, appetites, feelings, emotions, instincts; reason, judgment, mind, and so forth;

only a question of *degree*," says Clayton (p. 217). Lord Brougham also expresses the opinion that there is "No specific difference, but rather a diversity of *degree*." Agassiz and Huxley are represented as holding similar views. (Trans. of the New Zealand Institute: vol. ii, 1869, p. 278.) Maudsley holds that in fishes and reptiles reason is gradually developed from instinct.

* "Spectator," Novem. 5, 1870.

† "Dissertation on the Passions."

‡ "Genesis of Mind," p. 476.

and even to the sciences which relate to a knowledge of the phenomena of mind, such as metaphysics, psychology, morals, and ethics. There is a still greater—more radical—divergence of opinion between popular and philosophical writers, as may be seen by reference to the definitions of such terms as mind, psychology, and instinct, given in the best standard dictionaries and encyclopædias, such as those of Noah Webster* and of Chambers.†

In my enumeration of the mental faculties or phenomena of animals, I have therefore avoided the pedantry of employing a metaphysical, psychological, or phrenological classification or nomenclature, and have preferred committing myself to no systematic arrangement and to the use of no strictly technical terms. The designations I have employed are those that, on the one hand, are in popular use, and that convey a meaning, which is at least quite as intelligible and precise as the terms in use among rival psychologists; and on the other, that have been used by all classes of writers on the habits of animals. The time approaches when it will become necessary to *revolutionise the nomenclature and classification* of the mental faculties that are common to man with the lower animals. Many of the terms presently in use are singularly inappropriate and mischievous. Their use is, moreover, a libel on the character of the lower animals, while it serves absurdly to exalt man at their expense. Thus, the very terms *animality* and *humanity* are, on the one hand, unnecessary distinctions; while, on the other, they are generally wrongly applied, for there is more animality in man and humanity‡ in animals than our self-conceit will permit us willingly to recognise. We cannot correctly speak of the *animal*, in contradistinction to the *human*, mind; inasmuch as mind is essentially the same in other animals and in man, differing simply in the *degree of*

* New York, 1831.

† Bibliographical Reference, No. 10.

‡ Youatt wrote a work on the "*Humanity of Brutes*:" and Jesse speaks with perfect appropriateness of the *humanity* of the dog. Gilfillan, in his "Life of Sir Walter Scott" (1870, p. 671), tells us that the great novelist "loved" his many "dear canine companions . . . for the *human* elements which they exhibited;" while Byron's reason for a similarly strong attachment to the dog was the very reverse one of their "unlikeness to men." Lord Monboddo and White speak of the *Human*-like character and appearance of the orang. (Maudsley: "Genesis of Mind," p. 86); and Ruskin writes, "There is in every animal's eye a dim image and gleam of *humanity*; a flash of strange light, through which their life looks out, and up to our great mystery of command over them, and claims the *fellowship* of the creature, if not of the *soul*."

its development, and in the mode of its expression. The so-called *animal* or *brutish* propensities are frequently more strikingly exhibited in man than in lower animals; and this word *lower*, so far as regards the morals or virtues of certain animals, most incorrectly designates their relation to man. Again, the use of the terms *brutes* or *beasts*,* *brutal* or *bestial*,† *brutality* or *bestiality*, is an insult to animals, to whom the application of the words *humanity* or *intellectuality*, might be more fitly made. In short, for present inappropriate terms, we must substitute others that more truthfully represent the relative endowments of man and other animals; and this is one of the many important fruits that may be expected to result from a comprehensive study of mind throughout the animal series, regarding man simply as an animal, psychically differing far less from his inferiors in the zoological scale than is at present generally believed.‡

II. Illustrations of the Mental Endowments of Animals.

I. Natural Disposition or Character.

Certain of the lower animals possess quite as much as man does a natural disposition or character, which includes both *virtues and vices*—amiable and unamiable, noble and ignoble, qualities. Not only, however, is there frequently a character pertaining to the species [*e. g.* timidity in the sheep; peacefulness in the dove; cunning in the fox; fidelity in the dog; patience in the ox]: but among certain animals [*e. g.* the dog] there is an *individuality*,§ occasionally quite as marked as that which exists in man. Many are the eminent writers that have

* “What is a man—
If the chief good and market of his time
Be but to feed and sleep? A *beast*—no more!”
(*Shakespeare.*)

† Cowper, in his verses on Liberty, speaks of “all constraint” begetting
“In those that suffer it a sordid mind,
Bestial, a meagre intellect, unfit
To be the tenant of man’s noble form.”

Another Poet exhorts us to

“Move upward! working out the *beast*,
And let the ape and tiger die!”

It would, however, be at least quite as correct to speak of the ape and tiger working out the *man*! Lord Erskine used to speak of animals not as the *brute*, but as the *mute*, creation.

‡ “They are not then,” says Menault (p. 114), “so very unlike *us*; and *we*, like them, are *animals*.”

§ Goodsir speaks of the *personality* of man as “distinguished from the *mere individuality* of the lower animals.” (P. 328.)

borne willing, cordial, and reverent testimony to the general amiability, nobleness, or gentleness of disposition of certain of the lower animals. Of the *dog*, Sir Walter Scott says, "He hath a nature noble and incapable of deceit He hath a share of man's intelligence, but no share of man's falsehood!" His admiration for the character of this animal was such, that he declared he "would believe anything of a dog."* "What is there," asks Blaine, "noble, generous, or amiable in man, which may not be found in the dog also?" † Dr. John Brown, referring to the now well-known "Rab," writes—"When I think of that noble head, with its look and eye of boundless affection and pluck, simplicity and single-heartedness, I feel what it would be for *us*, who call ourselves the *higher* animals, to be in *our* ways as simple, affectionate, and true as that old mastiff!" ‡ Even Buffon, who, as Lord Brougham remarks, was "sceptical beyond all men of stories respecting animal reason," and whom he characterises as "the great adversary of brute intelligence," bears testimony to what he calls "ardour of sentiment" in dogs; of whom he says, "Neither ambition, interest, nor desire of revenge can corrupt them. . . . They have no fear but that of displeasing. They are, in fact, all zeal, ardour, and obedience—more inclined to remember benefits than injuries." Mons. Blaze asserts that "the dog most undoubtedly has all the qualities of a man possessed of good feeling;" while "man has not the fine qualities of the dog."§ Dibdin says dogs have "noble passions, and possess a rectitude which, if it be instinct, is superior to reason." || Equally high have been the opinions expressed regarding the *horse*. Chambers' compiler remarks that "his conduct would do credit even to the bravest human nature;" ¶ and that there is "no reason why cerebral development should not influence the *character* of a horse as well as that of a man." Whyte-Melville, the novelist, writes, "I will say that in generosity, temper, and fidelity there is many a woman, and man too, who might well take example from the noble qualities of the horse."** The *elephant* is described as of "mild disposition," a character that belongs to all the herbivora. Chambers' compiler says that the elephant discharges his duties "with a regularity of disposition which seems almost mechanical." ††

* Jesse, p. 88.

† "Horse subsecivæ," 1st Series, Preface, p. xlviii.

‡ "Tour through England," quoted by Blaine.

** In his novel "M. and N.," vol. i., 1869, p. 233.

† Introduction, p. xviii.

§ Jesse, p. 174.

¶ Article *Horse*, p. 7.†† Article *Elephant*, p. 17.

The greyhound is described as mild and gentle, possessed of a natural simplicity and peaceableness of demeanour. Jesse speaks of the "kindliness of disposition" of the Newfoundland dog; the "gentleness" of the Scotch deerhound; the "modesty" of the Irish wolf dog; and the "fine disposition and noble character" of the dog in general.* Certain monkeys of the new world—such as the *Ateles*—are of a gentle, or even amiable, disposition.†

Ant-life affords pictures of "toil, industry, perseverance, sagacity, courage, love, harmony, and amusement" . . . "attributes which have made one of the tiniest insects the permanent emblem of some of the highest virtues."‡ The *elephant*, at the other end of the scale, is characterised by its docility, obedience, attachment, gratitude, memory, sagacity, intrepidity, self-sacrifice, and other high natural endowments. The *dove* is the emblem of tenderness, gentleness, meekness, peacefulness; while the *swallow* bears an equally high reputation for conjugal fidelity, maternal devotion, social love, generous provision for orphans, filial gratitude, and patriotic sympathy for the welfare of the race. The *ass* has a reputation for "staid sobriety of demeanour;" the *camel* and *dog* for "sedateness" of behaviour. The latter animal, especially, can wonderfully adapt its behaviour or demeanour to circumstances, becoming grave or serious where gravity is appropriate, cheerful where mirth is the order of the day, as is more fully pointed out under the head of *Sympathy*.

Of the specific *virtues* of the lower animals the following are illustrations:—

A.—*Affections*. 1. *Motherly Love*.—Of a Pomeranian bitch, which attended its offspring with all the solicitude of a human nurse, Clayton says "a human mother could have done little more, nor shown more genuine affection" (p.210). Among *bees* certain of the workers are set apart as *nurses* to watch and rear the young. The elephant; various birds, such as the griffon-vulture, and swallow; certain insects, such as the spider, ant, flea; and other animals, have given conspicuous evidence of motherly anxiety, tenderness, and watchfulness.

2. *Attachment to Man*.—Of *dogs*, Dibdin says they love their master so entirely "that their very existence seems to depend on his attention to them."§ Lord Byron paid a graceful and merited tribute to the memory of a Newfound-

* Jesse, pp. 81 and 89.

† Maudsley "Genesis of Mind," pp. 76 and 99.

‡ Chambers: Article *Ant*, p. I.

§ "Tour through England," quoted by Blaine.

land dog, in a well-known "Address," containing the following lines:—

"Who labours, fights, lives, breathes for him alone.

To mark a *friend's* remains these stones arise.
I never knew but *one*, and here he lies."

Of a dog's friendship, Menault says "it is much warmer and more constant than that of man" (p. 332). Jesse remarks of their extraordinary *fidelity* to their masters, that it "puts to shame the vaunted superiority of many *human brutes*" (p. 93). Even Josh Billings says, as truly as quaintly, that "a dog is the only thing on this earth that luv's you more than he luv's himself."* Of the *Horse*, Chambers' compiler writes "Occasionally equine attachment exhibits itself in a light as exalted and creditable as that of the human species" (p. 13). The attachment of the dog to man is frequently characterised by its unselfishness, constancy, and devotion, for he sticks to his master or mistress through poverty and sorrow, and in spite both of neglect and ill-usage—a crucial test that *human* friendship cannot stand! Its affections are, indeed, both more true and enduring than those of man; and there have been many, besides Lord Byron, who have made the dog a closer or more real companion and friend than any fellow man or woman. The firmness of their attachment, together with their fidelity in positions of trust, and other admirable qualities, in which the dog successfully competes with man, have long led this animal to be selected for the guidance of the blind beggars of our streets. Dogs, we are told, lead about the blind "with an intelligent and affectionate solicitude highly worthy of imitation." The well-known address to "Poor Dog Tray" sets forth pathetically, but quite truthfully, the dog's services to man in this respect. The tenderness or gentleness with which the dog, elephant, and some other animals treat children—the care, watchfulness, or solicitude they bestow upon their charges—have frequently led to their being employed as *nurses* or *ayahs* to children. Clayton describes an elephant nurse as exhibiting, in the

* "Anecdotes illustrating . . . the intelligence and affection of *dogs* are familiar to every one, and form one of the most pleasing parts of many a book of natural history." Anthony Trollope, the well-known popular novelist, who is, however, obviously more conversant with *human* than with animal nature, speaks singularly of "affection and fidelity as things of custom with him"—the dog.—("The West Indies and the Spanish Main," Sixth Edition, 1867, p. 60.)

discharge of its duties, maternal anxiety and affection, fidelity to trust, care, watchfulness, forethought, and gentleness (p. 208). The cat, ass, horse, beaver, lamb, rat, ourang, chimpanzee, the *Ateles* and other monkeys, several birds, and other animals, frequently become nearly as much attached to their masters, mistresses, or children as do the dog and elephant.

3. *Brotherly Love*.—Several animals have been known to contract friendships with others either of the same, or of different, species. The *Ant* shows an *individuality* in its attachments. But it does much more. “The love of the community to which they belong is evident from the whole series of their proceedings, which all tend to promote the general good.” (Kirby.) . . . “They are ever intent to promote each other’s welfare.”* . . . “These observations bring to mind those ideal *Republics*, in which all wealth should be general, public interest serving as a rule of conduct for the citizens. It belonged only to Nature to realise this chimera; and it is only among insects, exempt from *our* passions, that she thought she could establish this order of things.” (Huber.) This active desire for the public good—for the welfare of the race, this social love, that occurs in the swallow and other animals, has been described as *Patriotism*, which Noah Webster tells us is the “noblest passion that animates a man in the character of a citizen.” There can be no doubt as to the nobleness of the passion; but *Patriotism* is scarcely a correct designation for it, so far as it is exhibited in other animals. The employment of such a term in such a sense, however, serves to illustrate the difficulty of designating the mental qualities of other animals by the terms currently in use among men. Many animals [Ex. the beaver, warren rabbit, and prairie dog of America; certain fish, *e.g.* herring; birds, *e.g.* *Loxia socia*, the Cape of Good Hope sparrow; and insects, *e.g.* locust, bee, ant, wasp] are social or gregarious, forming themselves into herds, flocks, droves, troops, bands, shoals, schools, or swarms, sometimes from the sense of mutual benefit derivable from number.† Some animals show a partiality for man’s society [Ex. dog, horse, Egyptian vulture]; while others are eminently unsocial [Ex. the hamster rat], or show an aversion to human society [Ex. hyæna]. Certain animals [Ex. among the carnivora] probably become solitary and unsocial by reason of the difficulty

* Chambers’ compiler: article *Ant*, p. 24.

† See also what is said under the head of “*Combinations for mutual Benefit*,” and subsequent five sections.

of procuring food within the same limited area for large, or even small, numbers.

4. *Attachment to Locality*.—Various animals manifest a wonderful knowledge and memory of places, a love of home, affection for birth-place, or for scenes of first love, or strong local associations [Ex. dog, horse, cat, swallow]. Instances of cats and other animals finding their way back from great distances over unknown country to their former homes “cannot be explained on any ground or principles known.” Milne-Edwards (p. 174), however, says that the dog and horse when lost, seem to retrace their course by the ordinary senses. But in the case of the swallow and carrier-pigeon, which fly in a straight line for very distant homes, he supposes the existence of “organs of sense of a kind unknown to us.”

B.—*Generosity and Benevolence*, sometimes amounting to absolute self-devotion, self-denial, or self-sacrifice—to what in man would be called *heroism* of the most exalted kind [Ex. dog, horse, elephant, certain birds, ant]. Dogs have fed, and thus rescued, lost children, while themselves starving, by conveying to them supplies of food. Frequently they have paid with their own lives for their generous protection of the weak or suffering. Many writers have testified to the “generous disposition” of the dog. Maudsley quotes instances of benevolence on the part of a canary to an orphaned nightingale: and of swallows to a captured companion.* He also points out how kindness or benevolence is sometimes developed in the *Simiadae* as the result of fear.†

C.—*Gratitude*.—Many animals [Ex. dog, horse, elephant, ant] are capable both of entertaining and expressing gratefulness for benefits conferred—such as relief of wounds, or defence against oppression; and of remembering and repaying the said benefits. Gratefulness is sometimes a cause of attachment, though not a common one. The elephant, by reason of it—gratitude alone—“might well put to the blush many who lay claim to a higher position in the scale of intelligence.”‡

D.—*Fidelity* to trust—to patrons, leaders, masters, § friends—is in many animals—especially the dog—characterised by utter disinterestedness, inflexible integrity, unribable honesty. There are frequent instances on record of dogs dying rather than abandon a trust. || Both elephant

* “Genesis of Mind:” pp. 491, 492. † *Ibid*, p. 76. ‡ Chambers, p. 22.

§ Byron, in his “Darkness,” says, the dog will be “faithful to a *corpse*, and keep the hounds and wolves away from it.”

|| Jesse, pp. 93 and 449.

and dog are capable of the faithful execution of a trust though away from their master's eye. Hence the frequency with which dogs are employed as messengers—taking charge both of money and food; or as protectors of the abodes and property of their masters, in which latter duty their vigilance and trustworthiness are proverbial. [Ex. the mastiff.] Elephants so value their leader, that in danger they place him in their centre, and defend him with their own lives. The elephant executes his master's orders "with haste, but without precipitation, for his movements are always deliberate;"* while the dog delivers messages "with a seriousness befitting the imagined importance of his mission."† A dog's honesty stands the test of guarding game, or other food belonging to his master, while himself starving. Various birds, and the bee, also exhibit, in different forms, fidelity or honesty.

E.—Courage.—Many animals show a wonderful amount of spirit, daring, boldness, bravery, firmness, or intrepidity. [Ex. dog, horse, elephant, monkey, pig, mule, ass, certain birds—night-hawk, and raven—some fish, and the ant.] The courage of the dog is sometimes invincible and to the death. Jesse gives instances in the Irish wolf-dog and Scotch deer-hound.‡ The war-horse partakes in the warlike passions of his master; his bravery has been tested on many a fatal field, including the scenes of the present Franco-Prussian War. As long ago as the time of Job (xxxix, 22), it was acknowledged, as an attribute of the horse, that "He mocketh at fear, and is not affrighted." Equally marked is the intrepidity of the elephant on the battle-field. Even beetles show an unflinching fortitude, even to the death—for when counterfeiting death they will suffer themselves to be gradually roasted "without moving a single joint."§ What could an American-Indian brave, or a Scottish covenanting martyr, have done more? Even

"The smallest worm will turn being trodden on :
And doves will peck in safeguard of their brood."

F.—Emulation.—The horse and dog, especially, not only exhibit personal rivalry, struggle for victory, but they evidently *understand the spirit* of emulation, and they display in it an eagerness, ardour, enthusiasm or vehemence that at least rival these qualities as displayed in man's contests. Un-

* Menault, p. 256.

† Jesse, p. 176.

‡ Ibid, p. 89.

§ Chambers, article *Spider*, p. 8.

fortunately their contests further resemble man's in their thorough knowledge of the advantage, and in their consequent use, of unfair devices for insuring their own success and the defeat of their rivals. Among horses, "the racer and hunter seem to *know the object* of their exertions, and to be as keenly bent upon it as their riders."* They enter thoroughly into the *spirit* of the struggle. At the last meeting [Janry., 1871] in Edinburgh of the "Scottish Society for the Prevention of Cruelty to Animals," Mr. Scot-Skirving, of Camptown, stated that "Horses sometimes . . . over-worked themselves in the pleasure of the chase, so that they fevered and died . . . from pure excess of pleasure." While Councillor Gowans confirmed this assertion by stating that, in hunting, "Many horses would go on till they died, if they were allowed to do so."† In the wild state stallions have furious contests for supremacy. The Eskimo dog rivals as to ardour the horse in racing. Greyhounds and other dogs will course till they die of sheer exhaustion. We owe, it is said, some of the most beautiful singing of birds, in part at least, to their rivalry or emulation. The "singing matches" in which birds—such as the canary are the performers—are analogous to the racing or coursing of the horse or dog: utter exhaustion is frequently the fruit of persevering exertion.‡ The rivalry of a strange queen bee in a hive gives rise to mortal combats, the survivor reigning: while that of a dowager queen frequently lead to emigration, and the foundation of new colonies.§

G.—*Caution* is displayed in many forms by many animals, especially by those which are the sport or prey of man; or whose very existence, in the midst of dangerous enemies, depends on the appropriateness or efficiency of their means of escape or defence. The horse, ass, and mule are proverbially so cautious on dangerous ground, as on alpine tracks or treacherous morasses, that the traveller, if he is wise, trusts himself implicitly to their guidance. The dog-leaders of dog-teams, among the Eskimo, elephant-leaders of elephant-herds, stallion-leaders of wild-horse troops, all exhibit the quality of caution in a high degree in their reconnoitering expeditions. They send before them *scouts*, they plant *sentinels*; and they use *signals*, which are infinitely more intelligible to every member of the expedition than telegraph messages are too frequently to *us*. They adopt *precautions* for safety and against danger; they have obviously an estimate of the *nature and*

* Chambers' 'Encyclopædia,' art. *Horse*. † "Scotsman," Janry. 13, 1871.

‡ Maudsley: "Genesis of Mind," p. 492. § Milne-Edwards, pp. 169 and 170.

degree of peril, with a knowledge of, and faith in, the best means of escape or protection. They can distinguish more-over real from sham danger, and speedily detect the nature of "boggles" or "scarecrows." The wolf, wild-horse, hippopotamus, coney (hyrax), ant, and other animals show different kinds or degrees of wariness. The marmot and flamingo have sentinels.*

H.—Obedience [docility, submissiveness, tractability] is shown, not only to man by such animals as the dog and horse, camel and ox; but to the authority of parents or leaders, or of public law [Ex. dog, horse, elephant]. Even the volatile ape shows obedience to a chief. This implicit obedience frequently arises from confidence in the superiority—whether moral or physical—of man; or of leaders [Ex. Eskimo dog]; or from their recognition of the respect due to parents, old age, or established law. The respect of the dog for man frequently amounts to *reverence*; so that it has been said, first by Bacon and then by Burns, "man is the *God* of the dog." Leroy points out that the special affection of a creature for one of a superior order may be considered a semi-religious state of mind; so that the *reverence* of the dog for its master—involving frequently a devotion so absolute and self-absorbing—may be regarded as, in a sense, a *religious sentiment*.

I.—Patience [endurance, forbearance, resignation] even under injury or cruelty, is exhibited by the dog, cat, horse, ox, camel, ass, and ant. Many carnivorous animals display a degree of patience, that in man would be marvellous, in watching for their prey [Ex. fox, cat, and owl]. The camel and elephant again—as well as the dog, horse, and other animals—can wait most patiently the opportunity for vengeance.

J.—Industry [diligence]. Many animals display both willingness and capacity for labour or toil of the severest kind [Ex. horse, dog, elephant, hamster rat, spider, ant]; while the "busy bee" is an emblem of quiet, unostentatious, persevering industry. In their labours, these and other animals show, on the one hand, a large amount of *energy*; and, on the other, of *perseverance* [Ex. dog, ant]. Energy or activity is exhibited by the pointer and setter dogs in pursuit of game; by the shepherd's dog in the discharge of its useful duties; by the horse and ass, elephant, various fish and birds, and the ant—that embodiment of all the virtues.

* Milne-Edwards, p. 173.

K.—Providence [forethought, or foresight, including frugality or economy]. The hamster rat stores up provisions for the winter; the jerboa lays up magazines of food; while the squirrel, bee, beaver, dog, ant, and other animals have similar cumulative or store-forming habits—make similar timely provision for winter, scarcity, age, or other contingencies. “The *Lagomys pica*—a Siberian rodent—not only lays up a store for the winter, but he turns his grass into hay *exactly as our farmers do* before he stores it.* The dog has been known even to accumulate or save money.†

There are many other *Virtues* that characterise certain of the lower animals, which, however, it is unnecessary to specify at present. They include, for instance, *Dignity*‡ [Ex. dog]; *Meekness* [Ex. lamb, dog, elephant, certain birds]; *Good temper, Feeling, or Humour*; *Love of Approbation* [dog]; *Shrewdness* [dog]; *Tact* [dog]; *Independence* [dog]; *Discretion* [dog].

With the foregoing *good* qualities are associated in animals many of an opposite kind—some of them amounting to *vices*; of which the following furnish illustrations. Toussenet tells us of the sparrow, that he is “quarrelsome, a chatterer, tippler, jeerer, plunderer, babbler, impudent, familiar, riotous, and obstinate.”§ The character of the owl is said to be taciturn; the heron melancholy; the gull insatiable and clamorous; the magpie inquisitive, boasting, and thievish (Menault). The monkey has a general reputation for mischievousness, selfishness, cruelty, intractability, and incapability of moral self-control. The *Cynocephali* are in particular cruel, of changeable or capricious disposition, exhibiting short-lived affections, delighting in malice, deriving satisfaction from the exercise of despotic power of might, bullies and tyrants—but at the same time fond of their young.||

A.—Obstinacy.—“There are perverse dispositions, which nothing can alter, and upon which *education* is thrown away.”¶ The obstinacy of certain animals, however—such as the mule—is probably, in great measure, due to bad usage by man.

B.—Laziness.—The turnspit (dog) hides itself to avoid irksome duties; while, with the same object, other dogs feign lameness.** Some bees and other animals are veritable

* Milne-Edwards, p. 156.

† Jesse, p. 163.

‡ With its contrast, it is well represented, pictorially, in Landseer's “Dignity and Impudence.”

§ Menault, p. 103.

|| Maudsley: “Genesis of Mind,” pp. 74 and 75.

¶ Leroy, p. 219.

** Jesse, p. 419.

“loafers”—*idlers*, doing nothing but availing themselves of the labours of their honest, industrious fellows.

C.—*Dishonesty*—amounting sometimes to *theft, robbery, or piracy*. Spiders are occasionally “Piratical cruisers that act the part of sea-kings in their little domains.”* Bates tells us that the Urubu vulture of Brazil, in its search for food, enters kitchens and *robs* saucepans by lifting the lids with its beak, exhibiting thereby both observation and *experiment*, reasoning, reflection, and judgment.† The raven, too, is a well-known thief. Some bees are dishonest, appropriating, by trick or force, the work or property of their honest companions. One colony of bees frequently robs or pillages another of its store of provisions.‡ The baboon is noted for its unfaithfulness to trust; and the chimpanzee and monkey for theft.§

D.—*Vindictiveness*—resentment, revenge, vengeance—[Ex. mandrill, camel, cat, dog, ant]. The camel is described as naturally spiteful, malicious, and unforgiving. The cat also is said to be spiteful. In the dog and elephant revenge is generally traceable to bad usage by man; their resentment is usually, if not always, under a sense of injury, which is long remembered, and for which punishment is *designed*.

E.—*Antipathies* (dislikes). The pug (dog) shows strong, and sometimes strange, dislikes.

F.—*Cowardice*.—The wolf, hyæna, turnspit (dog), and various birds show it in different forms or degrees.

Among other unamiable, or ignoble, qualities in animals are to be found *treacherousness* or *stealthiness* [Ex. cat, turnspit dog]; which, however, is frequently merely a development of that *cunning*, which is necessitated in many animals by the snares and sports of man. *Selfishness* [Ex. cat and monkey], which is also developed by the struggle for existence in wild or game animals. *Intractability* (cat and monkey); *Sullenness* or *Moroseness* (camel, cat); *Petulance* (monkey); *Impatience* (monkey); *Mischievousness* (monkey); *Tyranny* or *Bullying* (the cur dog); *Quarrelsomeness*, *Pugnacity*, *Combativeness* (dog, quail); *Stupidity* (ostrich).

There are certain other mental qualities that constitute important features in disposition or character; but which scarcely belong to the category either of virtues or vices, though they may influence or modify both. Such, for instance, are—

* Chambers, art. *Spider*, p. 18.

† Clayton, pp. 212-3.

‡ Milne-Edwards, p. 170.

§ Maudsley: “Genesis of Mind,” p. 74.

A.—*Vivacity*—especially in the young. The spaniel is merry and cheerful; “all life and animation,” says Jesse. The monkey is pre-eminently lively and playful. The “gam-bols” of the lamb are proverbial. Ants have their games and sports; and even work-horses have their Sunday amusements or recreations. The spirit of frolic in the latter class of hard-worked animals is made the subject of some versification by Robert Chambers.* The mocking bird carries its playfulness or self-amusement to the extent of serious practical jokes, decoying and terrifying other birds. Thus Dr. Good says, “It is . . . playful enough to find amusement in . . . deception, and takes a pleasure in decoying smaller birds near it by mimicking their notes, when it frightens them almost to death, or drives them away with all speed, by pouring upon them the screams of such other birds of prey as they dread most.”† Humboldt tells of a Capucin monkey which was accustomed to catch a pig every morning, “and mounting on its back, to ride it for the rest of the day.”‡

B.—*Curiosity* (inquisitiveness), baboon, narwhal, goat, dog (Jesse).

C.—*Pride*—sometimes characterised as “aristocratic pride” of the dog and horse.

II. *Acquired Disposition or Character.*

Experience and education, the struggle for existence in the wild state, training by, and association with, man in the domesticated condition, *form the character*, just as circumstances do in man. Just as in man, moreover, the influence of circumstances may be either for good or evil, though, unfortunately, in the case of animals, the latter predominates. For instance, *cruelty* in the torture of captured animals has been assigned to man’s teaching, and has been described as an *acquired instinct*.§ On the other hand, “horses have been taught . . . to conduct themselves with a propriety almost human.”|| Dogs, like children, can be trained to exhibit “company conduct”—a wonderful degree of self-control towards, and in presence of, each other. Thus Jesse narrates one case in which a party of 80 to 100 dogs were “drilled into the best possible behaviour to each other” (p. 337); and

* “Work Horses in a Park on Sunday,” in “Select Poems on Kindness to Animals,” “Chambers’ Miscellany,” revised ed., 1870, vol. vi.

† Combe, Vol. I., p. 518.

‡ Maudsley: “Genesis of Mind,” p. 75.

§ Maudsley: “Genesis of Mind,” p. 78.

|| Chambers, art. *Horse*, p. 27.

he quotes the celebrated Milan poodles, of 1830, which were trained to give gravity and attention to arithmetic, orthography and card-playing, as well as to engage in histrionic display; one dog, naturally of a "sedate disposition," representing a "grave and serious personage," walking with dignity, and "absorbed in reflection," the other being "young and giddy" (p. 333). There can be no doubt of the effect of *kindness* in educating and developing the *best* qualities of the dog and other animals; and equally little of the influence of man's bad example or cruelty in drawing out the worst features or dispositions of animals, in whom the virtues naturally preponderate. The contrast between the wild and domesticated state, as exhibiting the deterioration of character produced by man's influence, is frequently—as in the case of the horse, ass, mule, dog, elephant, and camel—very marked. In truth many, if not most of the defects, faults, or vices of the domesticated animals are traceable, directly or indirectly, to evil example, mal-usage, neglect, or non-education, on the part of man! A strong argument this for greater attention and kindness to the lower animals by the masters to whom they prove so useful, not only as slaves or drudges, but sometimes as companions and friends.* What is, however, of more immediate importance in our present inquiry is the fact that *acquired* dispositions, or aptitudes, become *hereditary* in other animals as well as man (Leroy).

III. *Emotions and Passions.*

Menault describes the lower animals as being subject to the *Heartaches* that cripple life; the *Passions* that torment; the *Pleasures* that elate; and the *Pains* and disappointments that depress and annoy. The *Simiadae* are extremely emotional: they "exhibit, in an extravagant manner, all the inferior kinds of emotion."† They are capable of *laughter* from mirth, and of shedding *tears* from grief: for Le Cat says he has seen the chimpanzee both laugh and weep; and Humboldt makes a similar assertion regarding a small South American monkey.‡

A.—*Anger*, passing into hatred, fury, rage or ferocity [Ex. the baboon]. The turnspit (dog) exhibits cordial hate. The same feeling leads to frequent *quarrels* among ants. The *fights*

* The existence of Societies for "The Prevention of Cruelty to Animals" shows that man is becoming alive to the *duty* he owes to lower animals.

† Maudsley: "Genesis of Mind," pp. 76 and 77. ‡ *Ibid*, p. 77.

and wars of many animals—such as the elephant, reindeer, wolf, stag, dog, and even the spider—are marked frequently by a singular degree of *ferocity*. What, however, is often improperly called “ferocity” in such animals as the boar, pig, mule, ass, is simply a combination of courage and desperation—the fruit of a sense of injury when baited or badgered by man.

B.—Grief [sorrow, unhappiness, misery]—in every degree—is exhibited by the dog especially, and other domestic animals, in consequence of the absence, removal, or death, of masters; or from the fear of being left behind, killed, or sent away. Jesse (p. 418) speaks of the “unhappy look” of the turnspit. Blaine gives several instances of the *death* of dogs from grief at the loss of masters or parents.* Birds also suffer sorrow from disappointment. The nightingale and other birds frequently die in captivity.†

C.—Disgust.—Jesse tells us (pp. 387-8 and 406-7) that a good setter or pointer dog exhibits actions, or facial expressions, betraying intense disgust at the operations of a bad sportsman.

D.—Sympathy (compassion)—equally with joy and sorrow, mirth and grief—with *Human* emotions of all kinds—with suffering and distress in the young and weak of their own species. The dog, we are told, often seems “actually to *know* and sympathise with the joys and sorrows of his master;” his sympathy is actively expressed by the exhibition of *appropriate behaviour*. Various birds—such as the rook—show great consideration for, and a generous protection of, wounded companions; they manifest a charitable desire to relieve suffering; they tend the old and young, weak or sick, with solicitous care, constituting the most attentive of *nurses*.‡ Maudsley cites a case of active sympathy on the part of a canary for a suffering young nightingale.§

E.—Sensitiveness—to shame or punishment, to insult or ridicule, is frequently as keen in other animals as in man. Buffon mentions an elephant that knew when he was laughed at. Expectation, as in a child, is equally a source of joy and grief in the dog.|| The mastiff sometimes shows a keen sense of insult; and many—especially highly-trained dogs—when conscious of error or wrong-doing, of disobedience of orders

* Introduction, pp. xxiv., xxv., xxviii., xxix. † “Genesis of Mind,” p. 492.

‡ See also what has been said as to *Nurses* under the head of “Motherly Love.”

§ “Genesis of Mind,” p. 492.

|| Jesse, p. 184.

under great temptation, show their keen sense of shame by their actions.

F.—Jealousy.—In pairing, says Leroy (p. 64), “Morality enters into love . . . the idea of mutual possession is established . . . jealousy becomes deep-seated and logical.” Under other circumstances, also, birds display jealousy, as well as anger, fear, and envy. Leuret mentions a case of *jealousy* in a male canary, that made a fierce attack on a nightingale to which its mate had been kind.* Baboons distinguish the sexes of mankind, and are jealous of man’s attentions to woman.† All pet dogs are jealous of disposition.

G.—Suspicion also is easily engendered in many animals, especially those which are apt to be trapped or snared by man, or which are the victims of his cruelty. Jesse (p. 418) describes the turnspit as having habitually a “suspicious look.” The experienced shark fears and suspects the bait; old sparrows and crows show fear and suspicion in refusing poisoned food.‡ Fear and suspicion exist, in all their grades, in hunted animals, as a perversion of *cautiousness*. *Fear, Suspicion, Remorse*, and other passions are sometimes as influential for evil or good among other animals as in man [Ex. baboon, various birds].

IV. *Self-control* (Self-denial, Self-restraint, Self-discipline, Self-sacrifice).

Menault points out (p. 50) that some of the most deadly *serpents* can be disciplined “to keep under restraint the natural tendency to use their fatal fangs” . . . and to “refrain from biting under the greatest temptations.” The *elephant* can so successfully conceal his emotions as to assume an appearance of perfect calmness of temper—“evenness of disposition”—while boiling over with resentment, and just about deliberately to repay injury. The horse, the Scripture tells us, “*hideth his distress until he panteth out his spirit at the goal.*” In connection with self-control, various animals display remarkable *presence of mind* in sudden and unforeseen danger. Thus spiders and beetles will simulate stupor or death to escape threatened injury or enemies; and the latter will permit themselves to be dismembered, or roasted alive, without flinching. The cornerake and fox also feign death, and the dog lameness, when a suitable *motive* presents itself.

* Maudsley: “Genesis of Mind,” p. 493. † Ibid., p. 77.

‡ Maudsley: “Genesis of Mind,” p. 492.

The leaders of troops, herds, teams, or flocks, are called upon habitually for the exercise of the two important attributes of self-control and presence of mind. The "happy families" of itinerant showmen, which frequently form part of menagerie exhibitions, display remarkably man's power of cultivating in animals of the most opposite dispositions self-control over their natural passions. Under such circumstances all kinds of feral animals are taught to live together in *harmony*. Almost literally "the lion lies down with the lamb;" a striking contrast to human society, where even the highest development of the religious sentiment fails to produce—in the persons of clergymen—anything like a similar degree or kind of harmony!

V. *Moral Sense* (Faculty, Cognition, Feeling, or Sentiment—Conception of Moral Relations).

The actions of certain animals—especially those which have been highly educated, such as the dog—show that they possess a distinct consciousness, perception, knowledge, or appreciation of the nature or meaning of right and wrong, of praise and blame, of rewards and punishments, of justice and injustice, of duty and its obligations, of trust and responsibility, of property and ownership, of moral and immoral actions, of honesty and dishonesty. The dog shows his consciousness of, and shame at, error or disobedience.* He possesses, to a greater extent than countless numbers of human beings, the "mens conscia recti."† Dr. Bennett, the Australian traveller, gives an instance of consciousness of wrong-doing in the gibbon;‡ and Du Chaillu describes a sense of wrong-doing and of shame in a young chimpanzee, which at once took to flight if caught in the act of depredation.§ Dogs show their sense of justice by disdaining any but a fair fight, refusing to take advantage of any injustice. They are capable both of feeling and showing *moral indignation* at wrong or wrong-doing. On the other hand, Reaumur

* Jesse, p. 424. Maudsley speaks of its "conscience-stricken tail dropped between the legs" ("Genesis of Mind," p. 72).

† The enterprising shopkeeper, who, observing on the sign-board of a rival on the opposite side of a street the—to him—puzzling phrase just quoted, and determining not to be outdone, inscribed, on his own shop-sign, what he considered the improved motto, "*Men's and Women's conscia recti*," might, with quite as much propriety, have extended his phraseology so as at least to have included *dogs'* also!

‡ "Wanderings in New South Wales," 1834, vol. ii., chap. viii., p. 156.

§ Maudsley: "Genesis of Mind," p. 74.

observes that, "The spirit of injustice is not so peculiar to man as it is thought. It is found in the smallest animals. Amongst insects, as amongst men, the goods of others will be usurped, and their work appropriated"*—as has already been pointed out under the head of *Dishonesty*. A dog's sense of duty, or of trust and responsibility, will lead him to *die* rather than abandon his post. Thus instances have been recorded of death by starvation while guarding abundance of food of the most suitable and attractive kind—game.† The dog has been frequently trained to the accurate delivery of *messages*, and to the faithful and zealous discharge of other difficult duties; while the elephant is also conspicuous for the willing and skilful performance of the labours to which he has been trained by man. "The notion of *Property* incontestably exists among rabbits . . . *Old age* and the *rights of paternity* are held in high esteem by them."‡ The mastiff shows a sense of *dignity*; while parent dogs sometimes mark their opinion of an immoral act—such as theft—in their progeny by *punishing* it. *Conscience* then—which has hitherto been regarded as the peculiar attribute or characteristic of man, as compared with other animals—exists equally in these so-called *Lower* animals. "Conscience is a *growth*" (says the author of the article "Ethics" in "Chambers' Encyclopedia") "which warns us that we do wrong. . . . The child is first taught obedience by *penalties*, and is made to associate pain with forbidden actions. This is the germ of conscience." As much as this may be said of many young animals, which are taught by their parents or trained by man. This—the "conscience grounded on fear"—animals undoubtedly possess. Whether they possess also the gradually developed "conscience grounded on spontaneous approval," is one of the many probably insoluble questions that arise in comparing the mind of other animals with that of man. However, "the great mass of *Human* beings have nothing more than the slavish conscience, or the habits imparted by the exercise of the parental and public authority; which shows what is the most natural foundation of *Moral Sentiment*." This much, at least, the lower animals have in common with man; in them a knowledge of right and wrong may be produced by education in the same way as it is in the child. The "contradictory consciences" that exist in human societies or peoples, and "intuitive morality"—if such a thing exists in man—are quite as

* Menault, p. 33.

† Jesse, pp. 176 and 410.

‡ Leroy, p. 49.

likely to occur in other animals. *Vice or virtue* in animals may be produced and cultivated by man. They may equally be *taught* expertness in theft, or self-control to the extent of self-sacrifice. Their masters may, therefore, *make their moral sense*, just as that of the child is gradually developed by example on the one hand and precept on the other.

VI.—*Memory* (Remembrance)

of persons, things, and places—of kindness and cruelty—of benefits and injuries—is exhibited by many animals. [Ex. dog, cat, horse, ass, elephant, camel, and some fish.] Even the tortoise remembers persons and places. They frequently show their *recognition* after long severance of all associations. Plato held that the dog, who barks at people he does not, and wags his tail at those he does, know, must be a philosopher. Memory is, moreover, along with observation, the basis of their education. The parrot is supposed to have *a special memory for words or phrases, and we speak of “parrot-learning”* as synonymous with “learning by rote”—a mere mechanical process—a mnemonic accomplishment independent of intelligence or understanding. But this is just one of the many popular libels or fallacies that exist regarding the mental endowments of animals; for the parrot could not exhibit its feats of speech had there not pre-existed attention, imitation, and other mental qualities. We shall see, moreover, in the sequel, that animals not only *understand* each other’s language, but *man’s*, and not only his looks or actions, but his *words* and phrases. The application of the term “parrot-like,” to mere mnemonic effort is not, therefore, correct or appropriate. The parrot must have some understanding of the meaning of the phrases it has learned and repeats, for it *varies its expressions according to circumstances*.*

VII.—*Observation*.

Many animals show great acuteness of observation of, the closest *attention* to, natural phenomena, the doings of man, or the movements of their enemies. [Ex. dog, cat.] Lord Brougham refers to their “minute and exact *observation* of things, which escape *us* in the greater multitude of our ideas and concerns,” as illustrating “how well animals can profit by *experience*, and draw correct *inferences* from their observa-

* Maudsley: “Genesis of Mind,” p. 490.

tions" (p. 270). So close or keen have been their habits of observation in some cases that the results have been regarded as preternatural *presentiments*, e.g. in the dog, when apprehension or presentiment of danger has led to the saving of human life or property, to protection from murder or robbery. Close attention to the signs of the weather renders many animals the most trustworthy of *weather prognosticators*. (Ex. Eskimo* and other dogs.†) "The wild rabbit is the best of weather prophets‡ It interprets the meteorological signs far more shrewdly than man, and *acts* on its interpretation."§ By observation, animals acquire a considerable *knowledge of natural phenomena*—such as those of action and reaction, gravitation, the power of the lever, momentum, and of certain principles of pneumatics, hydrostatics, hydraulics. They become acquainted with the displacement of fluid by solid bodies; the increase of impetus by distance of fall. They construct their rafts from observing the floating of timber, twigs, and straws. Dogs and other animals very soon acquire the ability to distinguish the strange from the familiar. If a strange buck attempts to join a herd of reindeer does the result is a fierce onslaught upon him by the "haldar," or leader, and a conflict ensues which is scarcely to be surpassed for its "rage and fury."|| If a strange dog gets into a large flock of sheep, or a strange bird into a large assemblage of its species, it is at once detected and punished—sometimes by death. It is partly on this principle of the *recognition* of the strange as contrasted with the familiar—of beggary as compared with gentility—that the use of the watch dog is founded. By the elephant, "food, friends, and foes appear to be detected with great certainty, and at a considerable distance."¶ The bison and other ruminants recognise their masters only under certain circum-

* Throughout this paper I have used the word "Eskimo" as the shortest modern equivalent of the older term "Esquimaux." On the spelling of the words in question, as well as of Eskimo words in general, I have remarked in a contribution to the "Lichen-Flora of Greenland" in the "Transactions of the Botanical Society of Edinburgh." Vol. x, 1870, p. 304.

† Jesse. P. 389.

‡ The poet very truly states it that in certain animals as in man—

"Old experience doth attain

To something like prophetic strain."

§ "Spectator," Nov. 26, 1870, Art. "On the indifference of animals to speculative truth."

|| "Reindeer Hunting," *Chambers' Journal*, 1870, p. 827.

¶ Chambers: Art. *Elephant*, p. 4.

stances.* The hive bee destroys all strangers.† Ants know the sex and destination of each egg.‡

VIII. *Imitation*

implies more or less close observation or attention. Many birds [Ex. parrot, starling, blackbird, jay, and jackdaw] and certain other animals, such as the ape or monkey, imitate a great variety of natural sounds; while the dog, monkey, ourang-outang, parrot, and other animals mimic the behaviour of man. Imitation is "very powerful" in the mocking bird (*Turdus polyglottus*). "It possesses an instinctive talent," says Dr. Good, "of imitating the note of every other kind of singing bird, and even the voice of every bird of prey, so exactly as to deceive the very kinds it attempts to mock."§ The powers of imitation in animals are, like most other of their mental qualities, susceptible of high cultivation and perfection.

IX. *Stratagem*—(Artifice; Cunning; Finesse; Subterfuge; Duplicity; Deceit; Craft; Stealthiness;)

is exhibited mostly as a substitute for physical strength, or by animals that are weak as compared with their enemies. With many of the carnivora it is a necessity in their struggle for life. It includes precautions for safety, and implies much experience, observation, reflection, judgment, device or design, ingenuity, perseverance, patience, and other mental qualities. The fox is proverbially regarded as the emblem of cunning, and the cat of stealthiness. But there are many other animals that have habitual or occasional resort to cunning or stratagem in some form. Thus the dog substitutes stratagem for force when it feels itself weaker than its enemy or its work. Shetland ponies sometimes show the deepest cunning. The wiles and blandishments of female decoy elephants render them "the very impersonations" of deceit. The craft of the spider is illustrated in its well-known poetical address to the fly. The lurcher dog is used by poachers in their nocturnal depredations; while other dogs have conducted thefts of sheep on the large scale, and for long periods, with wonderful secrecy and adroitness (*e. g.* the once well-known "Yarrow.") The

* Milne-Edwards: p. 173.

† *Ibid.*, p. 171.

‡ *Ibid.*, p. 170.

§ Combe: vol. i., p. 518.

crocodile, too, has a popular reputation—well deserved—for cunning; and the value of “crocodiles’ tears” has become a figurative by-word. The leopard, fox, rat, various birds—such as the raven and owl, and certain fish—all exhibit manifestations of stratagem or craft in the capture of their prey, or in their precautions against their enemies. Thus some animals take pains to confuse or obliterate traces of their retreat or track. Animal stratagem includes the fair or unfair devices by which in the rivalry of the race, for example, one horse gets the better of another; or one idle, dishonest dog or bee benefits by the work of the industrious and honest. Horace’s “*Sic vos non vobis*” is quite as applicable to many other animals as to man!* The dog exhibits sometimes *Secretiveness*—hiding things, usually for wrong uses.† *Cunning* is a common attribute of the *Simiadae* (Ex. monkey and chimpanzee). The baboon is capable of the most ingenious simulation or stratagem for the concealment of crime or the attainment of its ends.‡ The oft-quoted anecdote of the monkey using the cat’s paw to get the chestnuts out of the fire is a good illustration of Simian cunning—even were the incident itself apocryphal. Maudsley quotes instances of ingenious stratagem in crows and sparrows.§

X. Will—(Volition; Determining Power)

is shown in many animals in the form of resolution; determination; decision leading to immediate and appropriate *action*; deliberation or choice; and perseverance. [Ex. Dog, wild horse, cat, spider, ant.]

XI. Imagination.

The exercise of the Fancy is common among dogs in their frequent condition of half-sleep during repose. Leroy tells us that it is often in operation in the formation of their ideas; while Jesse informs us in addition that the dog frequently has “strange fancies” (p. 20). Combe regards *imagination* and *conception* as different degrees of the same power. The latter he defines to be the act of forming *ideas*—“depending on internal causes and without the interference of an external object.” (Vol. ii., p. 200.) Hope and fear are common among animals; and imagination is the source of both.

* See also what has been said under the head of *Dishonesty*. † Jesse, p. 164.

‡ Maudsley: “Genesis of Mind,” p. 76. § *Ibid.*, p. 488.

XII. *Abstraction.*

There can be no doubt that animals have, and exercise, the power of *generalizing ideas*. A recent reviewer writes:—"Animals abstract as well as we do, though not so much, and they have a very clear conception that similar signs precede similar consequences. There is plenty of abstraction necessarily implied in the intellectual feats" of which they are capable. Clear abstract ideas, for instance, lead to the avoidance of danger—such as the snares of man; for the hunted wolf or fox forms a distinct abstract idea of peril. The ourang and chimpanzee have the power of generalising.* Wild birds have an abstract or general idea when they fly from man, on account of the destruction, which they have learned by experience, he commits among them; and tame ones when they approach him with confidence for the benefits they know he can and does confer.†

XIII. *Understanding—(Comprehension).*

Dogs and certain other animals (Ex. horse and ourang-outang) show a wonderful facility of comprehension as regards the object of man's actions—the meaning of his words—the language of his gestures—even the physiognomy of his expression, and the inflections of his voice—as expressive of approbation or the reverse—of anger or sorrow. The dog and elephant especially have an intelligent understanding of *man's wishes*; the former endeavours thoroughly to enter into sympathy, to place himself *en rapport*, with his master.‡ The whale and other animals comprehend the nature of peril and the object of human foes. Many animals have the faculty of finding out the meaning of circumstances which are of very urgent importance to the individual. The dog acquires by experience and education a wonderful knowledge of human language—even of the meaning of words; he can read his master's facial expression, and understands his looks; he comprehends easily his mood or feelings, and even his thoughts or intentions. "How notable, for example, is animal intuition in the quick apprehension by some animals of man's mood of mind from a glance at his countenance or from the tone of his voice."§ Clayton observes that the sounds of the

* Milne-Edwards, p. 173.

† Maudsley: "Genesis of Mind," p. 494.

‡ See also what has been said under the head of *Sympathy*.

§ Maudsley. "Genesis of Mind," p. 478.

voice, and the meaning of the words, of man are “understood by animals as distinctly and fully as they are by ourselves; and the intent and object of our actions are perceived by them in the same sense as we intend them to be perceived.” Buffon and Menault tell us that elephants understand not only human signs and expressions of face—of anger or satisfaction; but sometimes even language—words spoken at times and under circumstances utterly free of significance. The same animals “display great sagacity in comprehending the nature of their task and adapting themselves to it.”

XIV. *Reflection and Reasoning.**

The operations of many animals prove that they have the power of dispassionate and calm reflection and deliberation (Ex. elephant); that they can draw *inferences* or conclusions from facts; and that by reflection they can reduce these inferences to *principles* or laws (Leroy). They have a distinct perception of the relation of *cause and effect*, and act promptly and appropriately on their knowledge; they can discover the reason why? of many phenomena; they can foresee consequences, as the result of experience; they can calculate probabilities and act upon the results of their calculations (Ex. dog, ant): they hold councils and assemblies, at which they debate, discuss, consult, and argue; they can analyse and compare facts and experiences; they can plan, scheme, organise (Ex. ant, bee). The ass and dog are described as having frequently a “reflective” attitude or appearance. Buffon is forced to say of the elephant it “seems to *reflect, deliberate, think*, and not make up its mind till it has looked several times at the object without hurry and without passion.” Of how many men now-a-days can so much be said? Animals “reason very acutely on particular phenomena of great importance to their own safety and life.”† They reason “truly and much to the point,” says Clayton. The ant, we are told, “thinks while she works, and realises her idea in her work. . . . Her idea is (gradually) understood by others; then all work together in common

* A French savant in 1843 devoted himself to the investigation of the *Reasoning Powers of Animals*, and exhibited some marvellous results in the dog and horse. (Chambers. P. 20.) Combe regards the *knowing and reflecting* faculties, as well as *judgment*, as mere “*modes of action*” of the mental faculties. In the same category he places *perception*, which is “a special kind of action of *every* intellectual faculty” — relating however to external objects. (Vol. ii., p. 199.)

† “Spectator,” Nov. 26, 1870.

to carry out the plan which one has commenced." (Huber). Canon Kingsley in his "Letters from the Tropics,"* remarks, "If to foresee consequences from experience, and to adapt means to ends be the highest efforts of the intellect, then who can deny that the monkey proves himself a Man and a Brother and that he may by long and steady calculations about the convenience of Virtue and the inconvenience of Vice, gradually cure himself and his children of those evil passions which are defined as the "works of the flesh," and rise to the supremest heights of justice, benevolence, and purity?" Dr. Vimont assigns the faculty of *causality*—the perception of *causation*—to the elephant, ourang, and dog. The doubt, hesitancy, or indecision, of animals in difficulties implies reflection and reasoning.

XV. *Actuation by Motive*

has an important influence in developing the reasoning power of certain animals—such as the dog, elephant, and horse. Hogg, the Ettrick Shepherd, says, "I have hardly ever seen a shepherd's dog do anything without believing that I perceived his *Reasons* for doing it. I have often amused myself in calculating what his *Motives* were and I generally found them very cogent ones." Under stress of strong motives, "delicate and acute reasoning powers" are developed in the dog, stag, hare and crow. The faculties of reflection, analysis, inference, "and the memory of the result of all these processes, under great stress of motive, they will use to solve far more complex problems" than phenomena relating simply to their own safety.† The elephant and camel generally have an adequate motive or reason for avenging injury. The acts of many animals are "dictated by circumstances"—says Lord Brougham.

XVI. *Adaptation of Means to an End*,

and of the best means to a desired end—action suited to circumstances—are manifested in many of the operations of animals, who display, moreover, ingenuity in surmounting obstacles, fertility of resource in meeting emergencies, that require novel and effectual remedies. (Ex. elephant, ant, cat and other carnivora). The formation of pontoons by lemmings; and the navigation of streams in Iceland by mice on rafts

* "Good Words," April, 1870, p. 244.

† "Spectator," Nov. 26, 1870.

of turf or cow dung, are cases in point. Ants also form bridges or rafts of their own bodies. The elephant overcomes most ingeniously many mechanical difficulties; the dog has frequently discovered and circumvented the plans of murderers or robbers. Lord Brougham refers to the “*Rational* process of adapting means to the end, and of varying those means where the end cannot otherwise be attained.” He also speaks of their fertility of resource in using means towards an end, and the simplest means to gain that end, which is “the highest reach of ingenuity” (p. 251). Still more strongly writes Leroy—when their ingenuity is “excited and perfected by circumstances and difficulties, the greatest human genius has nothing to teach them” (p. 63.) The direction of means towards the attainment of an end, implies a knowledge of the object in view, as well as intention or design; and involves the operation of observation and reflection, patience and perseverance, and other mental qualities. By “varying the food given to the larvæ, the working bees or nurses can change them from working bees or neutrals into females or queens;” they therefore adapt the food—as regards quality and quantity—to the age and sex of the young individual.*

XVII. *Skill*—[Dexterity; Expertness; Inventiveness; Ingenuity]

is manifested in many other ways than in adaptation to new requirements. Many animals make a skilful use of their natural tools—their paws, beaks, tails, and so forth; but it is only under the pressure of necessity, or by education or cultivation, that their mechanical skill and inventiveness are fully developed and displayed. Various birds and fish—the ant and bee, the rat, camel, dog, and other animals—exhibit much skill in the construction of, and in the repair of injury to, their dwellings. The Baya bird of India constructs its nest of such a form and in such a position as to be inaccessible to enemies.† Some spiders (*Mygalæ*) construct large, commodious, complicated dwellings, furnished with hinged doors.‡ Hive bees form store-cells for containing the provisions of the community; and royal cells for the female larvæ. They also

* Milne-Edwards: p. 169.

† Milne-Edwards, pp. 161, 163: who also describes (p. 165) the mode of construction of the beaver's dwellings and dams; and pp. 165, 167, wasps' nests. On this subject, *vide* the recent works of the Rev. J. G. Wood, on “Homes without Hands,” and “Strange Homes.” (1870).

‡ Milne-Edwards, p. 157.

“strengthen the combs when any accident threatens their safety.”* Ants, too, are capable of prompt and suitable action under accidents or emergencies.† The dexterity and power of contrivance in the elephant are, in association with his great strength, patience, perseverance, and fidelity in the discharge of duty, utilised in certain mechanical employments. Thus in piling timber at Indian seaports he “manifests an intelligence and dexterity which are surprising to a stranger, because the sameness of the operation enables the animal to go on for hours disposing of log after log almost without a hint or direction from his attendant.” In the horse, again, there is sometimes a “remarkable display of intelligence in such things as the opening of doors,” turning and again fastening taps of water-barrels, &c. “Necessity is evidently as much the ‘Mother of Invention’ among the lower animals as amongst ourselves.”‡ In the feats of agility to which they can be trained, some animals display a remarkable motor ability—co-ordination of muscular action, accuracy or precision in the movement of their limbs. Illustrations are to be found in the “performing horses” of equestrians; and in performing dogs and elephants, goats and fleas. The dog can be taught to take part in theatrical displays, in which it has to represent man, using its hind legs to walk upon and its fore legs as arms; in the same way it is trained to bell-ringing and other feats. The elephant can be taught to dance or walk on the tight-rope, play at ball, take part in jugglery, sweep courts, *write* even. It bore its share also in the theatrical displays of ancient Rome.

XVIII. *Arts.*

Many of the arts of man are represented—and frequently well represented—among the lower animals. Several of these animals are *architects and builders*. Bees construct cities. Ants sketch plans of work like an architect, and adjudicate on a variety of such plans—institute in fact a “competitive examination.” They build and repair their galleried dwellings “with wonderful sagacity, regularity, and foresight.”§ They possess *sculptors, masons*, and other classes of *artisans*. The spider too constructs—both as an architect and a weaver—the most beautiful and the finest fabrics. The beaver, in the for-

* Milne-Edwards, p. 168.

† Ibid, 171.

‡ “Spectator,” November 26, 1870.

§ Chambers, p. 31.

mation of his dams and dwellings, shows his knowledge of *hydraulic engineering* as well as of architecture. The hamster rat constructs galleried dwellings. The hive bee displays a knowledge of *geometry, mechanics*, and architecture; and all of these animals, as well as many others, exhibit a very high degree of *artistic skill*. The ant, moreover, is an *agriculturist* and provident husbandman; she prepares the ground, sows, tends, reaps, and stores crops and food.

XIX. *Perception of Sound or Tune, Time, Number, Order, Space or Distance, Colour, Weight, &c.*

(a) *Sound or Tune*.—Many animals have not only a keen sense of sound, but a *musical ear*, and musical taste, which is capable of a high degree of cultivation, and which in some cases may be said to be wholly an acquisition the result of education. Several animals have been taught to *dance*, or move rhythmically, to music—for instance the camel, dog, and ass, in Egypt; the dog, elephant, monkey, and serpent in other countries. Not only can the dog be trained to distinguish musical sounds and to keep time to music in dancing, but its musical knowledge sometimes becomes so critical that it possesses the power of detecting false notes. There have also been so-called “singing dogs,” trained like birds to an imitation of human voice-sounds. The ass, dog, and some other animals are said to be naturally fond of music. Its influence in the “charming” of serpents is well known. The lizard also gives marked attention to music. The elephant moves in harmonious measure, and in order, to music; he beats time (*e.g.* with cymbals) and takes part in a variety of musical displays. Various birds learn to repeat airs and whistle musically (Ex. canary, linnets, siskin, and bullfinch); while many are “musicians by nature.” The carp has been taught, by the sound of a bell, to come to be fed; and the gold-fish by a whistle. Even eels have been trained to recognise the voice of their keeper.*

(b) *Number*.—Several animals can estimate the strength of an enemy, whether this be man or other animals. An old crow is “capable of *counting* higher than many savage tribes appear to count.”† There have been “calculating” or “arithmetical” dogs, trained (like the celebrated Milan poodles of 1830) to a wonderful knowledge of numbers, figures, and

* Milne-Edwards, p. 172.

† “Spectator,” November 26, 1870.

order; they have been taught orthography, card playing, and the game of dominoes.*

(c) *Space or Distance*.—Raptorial birds form an accurate judgment of space in catching their prey, as well as of time or duration, making allowance for both in their swoop down upon their quarry. An Indian fish, without putting its own head out of its element, captures insects flying above its surface by spurring a drop of water at each; a procedure which must involve a knowledge of, and allowance for, the influence of the refraction of light.†

(d) *Time*.—The toad has learned to appear punctually every day at the dinner hour of a family by whom it was fed; and it speedily changed its period of appearing when it found the family dinner time postponed or advanced two hours.‡

XX. *Combinations for Mutual Benefit.*

Many animals seem to be thoroughly aware of the value of harmonious co-operation, of concerted action, of discipline or order, of obedience to constituted authority, of “the power of numbers,” of the principle of union giving strength in measures of defence or offence. They consequently form unions, associations, or organisations for (a) pairing and breeding, (b) migration or travel, (c) hunting or foraging, (d) plundering or war, (e) defence, (f) amusement. Animals, weak or puny individually, become formidable collectively in attack or defence. *Locusts* march regularly in ranks as if trained by army discipline for war. There is no confusion, notwithstanding their vast numbers. This organisation in bands is cited in scripture (Proverbs, xxx., 27) as an illustration of their wisdom. *Dogs* form associations for mutual defence or aggression; in oriental towns (*e.g.* Jerusalem or Constantinople) they organise themselves into “bands.” Flocks of American pigeons are also called “bands.” Wilson, the American ornithologist, estimated a single band in Indiana as consisting of no less than 2,000,000 birds.§ “Bands” of lemmings are common in arctic and sub-arctic Europe; while in Kamtschatka a similar smaller rodent unites in bands of such size that “a single column will occupy two hours in defiling.|| Eskimo dogs form themselves into “teams.” The elephant and reindeer move in “herds;” the wild horse and peccary

* Jesse, p. 392.

† Maudsley: “Genesis of Mind,” p. 486.

‡ Maudsley: “Genesis of Mind,” p. 481.

§ Milne-Edwards, p. 163.

|| *Ibid.*, p. 159.

of South America, as well as our own swallow, in "troops;" wolves in "packs;" many birds in "flocks;" bees and ants in "swarms," and herring in "shoals." Many of these animals are capable of concerted action for the common good. And in order to this concerted action, they convene assemblies and hold councils, debating and discussing the arrangements most suitable for the common weal. Thus prior to a combination for attack or defence, *Ravens* convene assemblies for a particular *time and place*, and *swallows* hold their councils before they migrate south or north for the season. At such meetings they discuss the policy of flight or assault, calculate the chances of success in war, consult as to the best means of securing a given end; and *decision* having been arrived at, they follow it up by prompt and vigorous *action*. In deliberation and action alike there is exhibited a common deference to the general interest, recognition of and obedience to authority, control over the passions of individuals. Associations of animals are sometimes only *temporary* or for a specific purpose, while in other cases they are *permanent*. Thus the hyæna and wolf combine only when pressed by hunger; swallows for travel; beavers for the construction of their winter dwellings. The *Psittacus infucatus* assembles "in numbers towards evening to bathe and *sport* in some limpid stream."* The stoat and brown rat form combinations for attack, revenge, or the punishment of enemies.

XXI. *Recognition of Conspicuous Superiority,*

whether physical merely, or mental. Most animals that combine for the purposes of mutual benefit appoint *leaders* or commanders, whom they implicitly obey, and whose qualifications for command are generally obvious. Sometimes the sole or main qualification is physical strength, the power of might, the ability of the bravest to maintain his authority by force of tooth, or hoof, or horn, against all competitors. In such a case the leader is frequently self-elected; but he is liable at any time to deposition by a younger, stronger, bolder, more ambitious male of the herd or troop. Where the main qualification is mental ability—generalship implying experience, caution, decision, ingenuity or fertility in resource—election is more generally by universal suffrage or sufferance, and the commander's tenure of office is usually more secure. These "generals" of expeditions sometimes exhibit mental

* Milne-Edwards, p. 174.

qualities of the highest kind. A naval officer, writing in the "Inverness Courier," of January 13, 1870, of the Eskimo dog in Labrador, remarks: The Esquimaux travels over trackless snow dependent for safety and guidance on the leading dog, "which is possessed of wonderful sagacity." He chooses his own course uncontrolled; he is not harnessed to the team, but is free two to three "fathoms" in advance. He never tastes nor requires the whip. The others follow "unhesitatingly where he leads" "Though every object is buried in snow he will pursue the best and nearest course to their destination He will scent the coming storm, and turn to the nearest shelter, while the Esquimaux would be quite at fault; and, heedless of upbraidings or entreaties, will return to where they started from if there is no nearer refuge." Each community of *elephants* has its leader, who is generally the largest and most powerful animal in the herd. He controls the movements of the rest, gives alarm in danger, and "seems to examine and decide for the whole herd as to the safety of proceeding in any particular direction."* Sometimes they are said to follow the oldest pair as leaders; in which case they would appear to recognise the claims of seniority and experience, rather than of physical strength. Again, each troop of *wild horses* has its leader (a stallion), which directs the movements of all the rest, as the elephant does. The others "seem instinctively to move in a kind of concert, so that when they are assailed the stronger animals oppose the enemy and protect the younger and weaker."† Each herd of reindeer does is under command of a large buck, or "haldar" as he is called in Norway.‡ Superior talent finds sure promotion among ravens, the most intelligent birds being recognised as the leaders of the flock.

XXII. *Division of Labour and Subordination of Ranks.*

The importance of the principle of distributing work among the members of large communities—all having in view the general good—is both recognised and acted upon by many animals. Bees have several ranks or grades, which have been differently described by different authors probably as they occur in different genera or species; (a) the royal (king and queen), (b) the military (soldiers), and (c) the

* "Chambers' Encyclopædia," art. *Elephant*. † *Ibid.*, art. *Horse*.

‡ "Reindeer Hunting," "Chambers' Journal," 1870, p. 827.

artisan (labourers or workers): or as (a) neutrals or workers, of whom some are wax and honey gatherers, whilst others are nurses; (b) drones (males); and (c) the queen.* Ants also live in colonies—consisting of males, females, and labourers—that are neutral or sterile.† The *Termites* (or white ants) have four classes; (a) labourers for building, (b) soldiers for fighting, (c) purveyors or foragers for procuring and distributing food, and (d) nurses for the sick or weak, old or young. Thus ants feed each other, the purveyor conveying food to the worker; others take charge of the building, and act also as navvies, wood cutters, and carpenters; those which are nurses feed the young with appropriate food, and carry them out to bask in the sun in fine weather. Moreover in their wars they make capture of *slaves*,‡ who are subjected however to a mild rule, though they are compelled to work, or yield their produce, for the benefit of their masters. “Can we,” says Huber, “sufficiently admire the prudence and wisdom these insects display in the establishment of such an institution” as slavery? “We here trace neither servitude nor oppression They live under the same roof in brotherly and sisterly union;”§ which life, if this account be true, is certainly an improvement upon the same “peculiar institution,” as established by man. Huber asserts, too, that ants use captured *Aphides* as a sort of domesticated milk-kine; as to which assertion a critic observes—“All this is so incredible, so human-like in conduct, that we believe Huber’s enthusiasm has led him to give a wrong interpretation to a very common phenomenon.”|| Huber’s assertion—or a similar one—is however gravely cited by Milne-Edwards (p. 171), who says: “They attack the *Pucerons*, which, on being pressed by the feet of the ant, give out a drop of sweet liquid, which the ant carries off. But some are not content with this, but carry with them the insect (*Puceron*) to the hillock, and retain them there *as farmers do milch cows!*” *Female* ants, says Menault, “have no influence at all in the politics of the state, and are quite content with being the mothers of a powerful community;” a circumstance that commends itself to the consideration of those who advocate woman’s rights and the female franchise! Among spiders some are trappers or hunters; others weavers, divers, or aeronauts.

* Milne-Edwards, p. 168.

† Ibid, p. 170.

‡ Ibid, p. 171.

§ Chambers, art. *Ant*, p. 26.|| Chambers, art. *Ant*, p. 27.

XXIII. Wars

are conducted by many animals—even the most minute in size—in the most systematic way and on a grand scale. In the ferocity of the conflict, the bravery of the whole army, the strategy of the generals, their success in attack or defence, the results in booty or slaves, these animal wars rival the military contests of man, whether civilised or savage. The exploits of certain predatory ants on the Amazon, says Clayton, “read more like a page of Xenophon or Thucydides” (p. 212). Various ants—especially the black ant—conduct wars, arranging plans or schemes for attack, defence, or plunder, deciding or adjourning expeditions. While some of them are said to bury their dead, others are represented as cannibals devouring the slain, though it does not appear whether, in this latter case, they confine themselves to the enemy’s killed. Most obstinate wars occur between different colonies of ants. They can give *signals*, which immediately “change the route of a whole *army*: and observers, worthy of every credit, assure us that individual ants have been seen to quit the main body, and . . . return with *reinforcements*.”* Moreover, “Two neighbouring or rival hillocks have been seen to fight for the possession of *Pucerons*, and the conquerors have been seen to carry off their prisoners with the same care that they bestow on their own larvæ.”† Wild horses and other animals conduct marches admirably, marshalling the strongest in front or in the circumference, moving in wedge-like masses, or forming squares or circles. In conducting wars, certain animals make use not only of leaders or chiefs, but of scouts, sentinels, and signals. They subject themselves, or are subjected, to a rigorous military discipline; they submit themselves to command, and recognise the necessity for obedience and subordination. Military discipline in some animals—such as the horse and elephant—is frequently of importance in the military campaigns of man. There could be no cavalry were it not for the docility of the horse—its teachableness and bravery. The force of *discipline* in creating *habit* in the war horse has been singularly illustrated on many a battle field. One of the most recent instances is the following:—After the slaughter at Vionville, near Metz, in France, on 18th August, 1870—that is during the present Franco-Prussian war—“a strange and touching spectacle was

* Milne-Edwards, p. 173.

† Ibid, p 171.

presented." On the evening call being sounded by "the 1st Regiment of Prussian Dragoon Guards, 602 riderless horses answered to the summons; jaded, and in many cases maimed, the noble animals still retained their disciplined habits."* The elephant becomes useful to man in warfare in quite a different way; he can be taught to cut and thrust with a kind of scimitar carried by the trunk. The cruel carnage of human passion has its parallel in some of the lower animals. Such for instance is the *massacre* of the drones by bees; † the deliberate torture of captured animals or slaves; the ferocious punishment of strangers accidentally or intentionally entering an assemblage of their kind.

XXIV. *Migrations* (Temporary or Periodic, and Permanent).

The swallow and quail, and other birds, migrate southward every winter. The salmon, herring, tunny, and other fish have also their migrations. The well-known seasonal migrations of birds, which have hitherto been attributed to *instinct*, ‡ are regarded by certain modern authors of the Darwinian school as simply the result of *instruction* transmitted hereditarily from generation to generation. According to Darwin "*Instinct* is the result of the *experience* of the race in opposition to the older theory, that it is unchangeable. Instinct is an ensemble of *habits acquired* during a long period, and fixed by *heredity*."§ Darwin's views are accepted throughout Germany—that country of profound thinkers and reasoners, of patient and painstaking observers; and his opinions, on this subject at least, are infinitely more scientific, his explanation much more probable and satisfactory, than the untenable theories it displaces. Some animals—such as the bee, are constantly "swarming" off—emigrating and founding new *colonies*.|| Among men colonies are regarded as signs and out-growths of *civilization*. What are they to be considered in other animals?

XXV. *Social Arrangements and Government*.

The social impulses, the family and communal instincts, of the lower animals are developed in a considerable variety of

* The "Illustrated London News," of Novem. 26, 1870, gives a plate relating to the same incident, entitled "Riderless Horses answering the Regimental Call after Battle."

† Milne-Edwards, p. 168.

‡ As by Milne-Edwards, p. 159.

§ Academy, Feby. 12, 1870, p. 133.

|| Menault, p. 23. Milne-Edwards, p. 170.

practical forms. The principle of *communism*—of equality of rights and duties—is the basis of certain ant societies, *republics and democracies*;* while the *monarchical and despotic* forms of government are illustrated in the horse, reindeer, bee, and other animals. Ants, says Menault (p. 2), have a government, “which is a pure democracy, and seems to realise the political dreams of Plato or those of Sir Thos. More The property belongs equally to all The whole community forms a brotherhood, and no individual is distinguished by aught save ardent love for the public good.” On the other hand the jurisdiction of the “haldar” of a reindeer herd (of does) is monarchical or despotic—much like that of a Turkish Basha over the ladies of his harem. There is an imitation of the same relation of a Sultan to his harem among wild horses, and their mares and foals. Ants are divided into *nations*; beavers separate themselves into *families*; bees form “regular and permanent societies” (Menault), communities, or *colonies*.† Ants also live in colonies; so do the Cape of Good Hope sparrows (*Loxia sociā*), which construct their nests under a roof-work common to the whole colony.‡ Birds of passage have their *legislative assemblies*; ants and other warlike animals their *councils of war*. Professor Pumpelly, of Harvard University, Cambridge, Massachusetts, describing animal life in Texas and Arizona, speaks of “the *immense republics*, as they are commonly termed, of prairie dogs.”§

XXVI. *Laws and Punishments.*

Certain animals have regular *systems* of government; with *codes* of laws or rules, and punishments for their infringement. The bee, says Menault (p. 24), “possesses a policy which submits all to *law*, and provides for a crowd of eventualities, which could not have been foreseen.” A parent dog punishes its offspring for theft, errors, stupidity, or laziness;|| the shepherd’s dog punishes sheep that neglect its warnings; and there can be no doubt that much of the experience, aptitude, and intelligence of animals is the fruit of such correction of the young by parents or elders.

* Even Goodsir admits that some animals form “*perfect communities or politics*” (p. 315).

† Milne-Edwards: p. 166.

‡ Ibid., p. 165.

§ “Across America and Asia,” 1870, p. 3.

|| Jesse, p. 33.

XXVII. *Language.**

“The only requirements of language are connected ideas and the faculty of articulation.”† The former—connected ideas—many of the lower animals unquestionably possess. Some authors, such as Leroy, go so far as to assert that animals have a spoken language (pp. 73-4); while others content themselves with pointing out that there is much less difference between the language of animals and of man than at first sight may appear. Coudereau, for instance, remarks that “Man acquires the faculty of *speech* by his memory, labour, and imitation; the parrot does no more. From a linguistic stand-point this faculty is in its nature identical in man and animal. Man expresses his ideas by the aid of a language he has made his own. All animals do the same He presents simply, in this respect, a greater development of a faculty common to all social animals.” Certain dogs, birds, and other animals have been trained to *speak*, or at least to give distinct utterance to words or sentences. But this must be considered an exceptional triumph of education. Milne-Edwards admits that man is not the only animal that possesses the power of *pronunciation*—that is the *articulation* of voice-sounds. But he is (he says) the only one who attaches meaning to words and their arrangement, and thus possesses the faculty of *speech* (p. 150). In common with man, however, animals possess the *language of action*—of signs, sounds, gesture; and the *language of expression* or look—of the feelings or emotions. By these, or by other means which are less patent to our discrimination, animals undoubtedly communicate to each other, not only their wants or desires, suspicions or fears, but their ideas of all kinds. All the members of a flock or herd thoroughly understand one another (Ex.—dog, horse, cattle, sheep, elephant, camel, ass, mule, cat, goat); and not only so, but man—in the case of the animals which come more immediately under his observation—becomes enabled to interpret the language of animals, and to hold with them sometimes an intimate degree or kind of intercourse. The dog uses the language of the eye, tail, gesture or attitude, and voice. He *looks* his thanks or gratitude, asks permission by looks or licks, exhibits signs of joy or sorrow, of fear, alarm, or expectation;

* There are some remarks on the *Language of Animals* in Combe's *Phrenology*, vol. ii, p. 146.

† Leroy, pp. 73—4.

expresses civility or good humour, satisfaction or discontent. Of the shepherd's dog Jesse says there is "a *philosophic* look about him, which shows thought, patience, energy, and vigilance" (p. 229). The dog is equally capable of expressing blandishment, command, petition, appeal, protest, defiance, agony. By look or gesture he can show unmistakable contempt and disgust. His whine or howl may signify the loss of a master, or a sense of sorrow, distress, pain, or bewilderment. He is capable moreover of a great variety of facial expression. In him, as in the elephant, the very "pathos of expression" may be studied. His gesture-language is analogous to pantomimic action in man. "I am positive," says Sir Walter Scott, "that the communication betwixt the canine species and ourselves might be greatly enlarged." The wild horse signals and understands *signals*, which are virtually telegraph messages, conveying decisions as to flight, battle, or security. He has the power of understanding and communicating ideas—such as terror or alarm, recognition, discovery of water or pasture.* Elephant language—which is intelligible to every member of a herd—includes the war-cry, the note of alarm in danger, the call for assistance, the announcement of the discovery of food supply, or of safety, hunger, good humour. Buffon speaks of its "pathetic expression of sentiment," and of its "glance of intelligence," or "of penetration;" while Menault refers (p. 255) to its looks of gentleness, patience, resignation and attention. The camel expresses its sense of injury—utters its protest thereat—by cries of the most pathetic, or piteous kind, when too heavy a load is placed on its back. Ravens impart and receive suggestions from each other; they consult, discuss subjects bearing on the common weal, and hold "councils of war," and "committees of ways and means." The language of birds is at least partly *acquired*—the result of education. Toussnel specially studied the *Expressions of Emotion* in birds. Their songs are frequently their form of giving expression to the passion of love. They have been assigned partly also to the mere joyful sense of life, or they have been considered the result of emulation. By cries, birds communicate to each other a knowledge of peril or safety—evil or good. Thus it is by a peculiar cry that the swallow calls together its companions for mutual defence.† One bird, therefore, comprehends the acquired ideas of another. The *language of rooks*

* Chambers; art. *Horse*, p. 28.

† Milne-Edwards: p. 173.

was studied by M. Dupont de Nemours, and was said by him to be composed of twenty-five *words*. He also professed to have *interpreted the song* of the male nightingale; of which he published a translation.* Ants have intercommunication of ideas and intentions; they show mutual recognition and exchange salutations; they have modes of giving thanks or expressing gratitude: their language of affection is illustrated in the caressing or fondling of the young or sick. The bee too has the power of inter-communication—apparently by touch, however, not by sound.† The *Physiognomy of Expression* in animals, and its interpretation—the language of the emotions and passions, appetites or desires—are illustrated by the look of appeal, affection, or love—or of defiance, anger, fear, or sorrow; all these, and many other signs of mental action being duly recognised or understood by men familiar with the habits of animals. All work in common, says Menault (p. 99), *necessitates a mutual understanding*—whether among different individuals of the same species, or between the lower animals and man.

XXVIII. *Education.*

Quite as wonderful a change is sometimes produced in other animals as in man by education or training. Their teachableness,‡ their capacity or aptitude for instruction§, and the results of that instruction, or of the cultivation of their “faculties,” is frequently remarkable. All their mental qualities or attributes are capable of improvement by cultivation; their instincts, senses, emotions, volition, and intellect. There are, however, remarkable differences in the teachability of individuals of the same species. Some animals are very apt to learn the same accomplishments, which others can never be made to acquire. On the one hand there is a *natural aptitude*—the individual learning apparently without effort; and on the other a *natural stupidity*, which no perseverance can overcome. Animal education consists of the influence of

- (a) Experience, or self-instruction.
- (b) Training of the young by parents or elders.
- (c) Association with man, including domestication.
- (d) Training by man.

* Maudsley: “Genesis of Mind,” p. 491. † Milne-Edwards, p. 173.

‡ The words *educability* and *educate-ability*—now frequently used in these days of Educational Reform—are both bad in their construction and ambiguous in their signification. They have no place in the two quarto volumes of Noah Webster.

§ Kirby (p. 173) has some remarks on their capability for instruction.

(a) Unquestionably animals have the important faculty of learning or profiting by their own *experience*; hence the rapid and rash judgments—the imprudent or false action—of youth are gradually corrected by the experience of maturity and age—just as in man. The sense of inconvenience leads, for instance, to *improvement* in the construction of their habitations. Quite recently the celebrated M. Pouchet, of Rouen, has demonstrated the progressive improvement, with experience, in swallow's nest construction, within his own memory and observation, in that city. Both Leroy and Wilson (the American ornithologist), pointed out long ago that there is a marked inferiority in the nests made by young birds,—the improvement in those of older animals being due to experience on the one hand and instruction on the other. Leroy has also shown that the nests of the same species differ as much in their minute details as do human dwellings—though these differences are only recognizable by those who make a special study of birds'-nest construction. Wallace, in his "Contributions to the Theory of Natural Selection," "raises bird-nest-making to the rank of an intelligent art;" and shows how much of human construction is simply imitative, and, therefore, as fairly to be called instinctive as a bird's. As in man, experience leads to correct and prompt judgment and action in perplexity: age and experience give both authority and knowledge. Need, self-interest, is a wonderful sharpener of intellect and will; "urgent instincts make all animals more or less intelligent."*

(b) *Teaching of the young* and inexperienced by the mature, or old and experienced—including the instruction of offspring by parents—is illustrated in the case of many birds—such as the raven, griffon-vulture, and swallow—of the dog and many other animals. Not only various *arts*—such as those of construction [bird-nest-making and the like]—but *morals* are thus taught by old to young animals.

(c) Without any special or direct training, mere *association with man*, in proportion to the intimateness of the association and according to the character of the man, exercises a potent influence, whether for good or evil, on the domesticated animals. Jesse tells us that, in the dog, the *intellectual* faculties are more highly developed than in other animals, partly at least because of its intimate association with man. "The intelligent action of man, working by means of *domestication* on wild natures, will ultimately succeed in ameliorating, reclaiming, and perfecting them."† Domesti-

* "Spectator," November 26, 1870. † Figuier: "Primitive Man," p. 238.

cation also develops and strengthens the *intellect* in the horse; but, on the other hand, it has been remarked of the horse, that its "sagacious powers" in Europe are "most imperfectly developed." He is "in a state of utter degradation"—associated with human beings "of the very lowest grade:" "in the scale of creation infinitely below the generous creatures they torment."* Hence it would appear that man's influence is capable of developing on the one hand, or of preventing the development on the other, of the best and worst qualities of the animal mind. His influence operates chiefly in two ways: (a) by the force of his *example*; and (b) by reason of his *cruelty*, bad usage, or neglect. "Example, rather than command, *forms* the desired character" in the dog as in man, says Jesse (p. 38); and I have already pointed out the closeness of observation, and the powers of imitation in animals. There can be no doubt, I think, that many at least of the worst features of the animal character—many changes *for the worse* in the disposition and habits of animals—are attributable to the various cruelties of man—his sins toward them both of omission and commission. Thus the so-called ferocity of the mule, ass, horse; the filthiness and obstinacy of the pig; the sullenness and bad temper of the dog; the resentment and revenge of the elephant and camel—have all been attributed by competent authorities to the evil influence of man: another of the many weighty arguments that may be adduced against *cruelty to animals*.

(d) *Direct Instruction by Man* has yielded the most unexpected results, illustrative of the intellectual, moral, and other capacities or aptitudes of the lower animals. There have been "learned" dogs, pigs, ponies; "performing" dogs, goats, horses, elephants, serpents, even fleas—trained to wonderful exhibitions of muscular agility—of knowledge of numbers, letters, words—of human-like behaviour. Thus dogs have been trained to act as butlers, waiters, and boots; to go messages; to fish† or forage for man; to guide and beg for their masters; to take part in theatrical performances; they can be taught military tactics; and man has even been enabled by perseverance in the dog's education to gift him, like the parrot, with *articulate speech*. The Eskimo dog is trained to run in teams and draw sledges like horses; in truth, he is the horse

* A writer in "The Gentleman's Magazine," November, 1835, reviewing Jesse's "Gleanings of Natural History."

† Jesse (p. 148) mentions a so-called "Fishing" dog, which fished purely *for its own amusement*—just as man does.

of the arctic regions; and we have already seen how other dogs learn orthography, reading, card playing and other games, and acquire, or can assume, a demeanour rivalling in its gravity or playfulness that of man. A recent number of the "New York Times"* contains a report, as quaint as interesting, of a visit to an establishment in that city for the *education of dogs* for theatrical purposes. The following details, illustrating the experience and opinions of the "professor," teacher, or trainer, are, I think, worthy of extract and special record.

"No dog is so good as a poodle . . . You would be surprised to know what a difference it makes when I train a puppy from an *intellectual stock*. That poodle's grandfather ran 100 nights . . . in the 'Orphan's Friend; or, Innocence Avenged,' in the old country; and his grandson learns 'most anything at one showing . . . That dog would *steal* for me if I told him to . . . It takes a great deal of patience to instruct a dog thoroughly . . . You can't put any fixed price on a 'star' dog" [that is a regular first-class performer such as would 'draw' at a circus]. "I have been offered 800 dollars" (£160) . . . "A good dog—one that could play in the 'Montargis' piece, and had good size, and 'looked the part'—I see was sold in Manchester last summer for £200 . . . That little retriever is just worthless when away from me, and she is a very intelligent dog. 'Dolly! my slippers, pipe, tobacco, and a match!'" [These orders were given very quickly, and the dog scampered round the room and brought what was wanted, one thing after the other.] . . . "I can train a dog to be a regular *fire-extinguisher*. They scent fire and smoke in a moment. I had a big dog once who could put out any ordinary-sized fire in a moment. He would roll over and over in it *even though it burnt him*, until he put it out . . . That dog knows we are talking about him, and he's pondering on us. Dogs does a deal of *pondering*. That dog's an *inventive* dog, sir, and is capable of striking off for himself a perfectly *original* line of characters; only, sir, when up to the 'beauties' of his part—hinspired, I may say, regularly hinspired—he *will* drop his tail! May-be, sir, you don't know much about plays where the dog is the actor To see a dog come in with his tail *down*, like a whipped cur, takes all the 'life' out of the piece. Dog human-nature, notwithstanding any of the arts of man,

* Quoted in the "Edinburgh Evening Courant," Feby. 16, 1871.

will show itself *there* . . . The muscles at the joint of his tail had been clean cut, so that he couldn't drop it or wag it if he tried. *That ain't true art, and I'm above it.* It's the ambition of my life, however, to *succeed in that one point.* I suppose, if I had a very young puppy and trained him up alone—apart from any other dogs—and we neither of us lost our tempers—we might succeed. In the meantime, as you see, I satisfies my craving for *perfection* with short-tailed dogs. Nature and her defects ain't so perceptible in a bob-tailed dog . . . It ain't often," said the painstaking "professor," in conclusion, "I am appreciated!"

The cat, cheetah, seal, otter, eagle, falcon, hawk, owl, and cormorant can be taught to hunt for behoof of and by their human masters—an education or accomplishment that implies wonderful control over natural instincts, passions, or appetites. The monkey, naturally an impatient, mischievous, playful animal, can be made to guide and beg for blind men "with an address and foresight equal to any man."* Birds [Ex. carrier pigeons] can be trained as messengers, and the influence of education is illustrated by the fact that the old are more skilful and trustworthy than the young birds. Canaries have been taught a considerable variety of "tricks"—the exhibition of which has been made a source of profit to their masters. In Persia the falcon is trained to assist in the capture of the wild ass.† The rat can be taught theatricals; and the flea military drill; while many other animals [Ex. horse, ass, carcary, pig, parrot] are also eminently teachable.

There is thus among the lower animals—quite as much as in man—a capacity for mental development, progress, or improvement under *proper* education. But proper education among animals is as yet almost a thing unknown. Hitherto, for the most part, the training of animals has been undertaken by man only for his own selfish ends; the displays of agility or ability in the dog, horse, and other animals have been simply a source, or the source, of income to their masters; or the useful powers or aptitudes of animals have been in other ways applied solely to the necessities or pleasures of man. In these cases, animals have not fallen into the hands of those most capable of educing their finer qualities. Education has been that of fear and penalties—not of love and

* Menault, p. 364.

† Maudsley: "Genesis of Mind," p. 488.

kindness;* it has been too frequently the fruit of a cruel discipline, which, while it might and did develop a wonderful degree of motor or mental cleverness, was little calculated to develop the moral nature—the finer sensibilities—of highly sensitive animals. When the education of animals is entrusted to *proper* hands, and conducted on *proper* principles,—when it is fully recognised as a basis for instruction that they possess both an intellectual and a moral nature capable of improvement—as well as passions, appetites, propensities, or instincts capable of control or direction—that in animals as in man there is “a large amount of *undeveloped mentality*” —what Maudsley speaks of as a *potentiality* for high mental development—we may expect results of which those mentioned in the foregoing catalogue [of the qualities, aptitudes, or accomplishments of animals] are but the feeblest indications—the most trivial illustrations. Their *proper* education and protection is a *duty* man owes imperatively to the lower animals, not only because thereby they will become more useful to him—whether as servitors or friends—but because they have too long suffered the cruellest injustice at his hands; while, moreover, his own position in the scale of life is not, in many respects, superior to theirs! If a dog or horse is not a man, he is at all events, in certain respects, a *brother*,† capable of repaying man for all the affection and labour he may bestow on the training of powers naturally noble and useful.

XXIX. *Hereditary Transmissibility of Acquired Qualities*

is a subject that appears to me deserving of full investigation in reference to the inter-relations of *instinct and reason* in animals. We already know that certain *acquired* qualities or habits are hereditarily transmitted in animals, just as they are in man;‡ and it is equally true that Habit—which

* A consideration of their utter helplessness, and the slightest reflection on their capacity of appreciating such an influence, are calculated surely—

. “To teach us to be *kind* :

That nature’s first, last, lesson to mankind”—(*Young*.)

† Robert Chambers in his verses (*ol. cit.*) on “Work Horses in a Park on Sunday,” urges us, very properly, to

. “Make the humble beast to man

A patient, pleading *brother*.”

‡ In man—Bucknill and Tuke point out in their “Manual of Psychological Medicine” (1858)—the effects of *hard work and low diet* are hereditarily transmitted; and similar transmission of similarly produced mental conditions is likely also to occur among other animals.

Combe defines to be "a power of doing a thing acquired by frequently doing it"—as in man, frequently modifies organisation in animals. But much remains to be done in the study of *heredity* in animals; and I know no more promising, attractive, and important field for a student's research. In man it is said proverbially that what is in some persons *intuitive* is in others the fruit of *experience*—a proverb that is based on truth, not only as regards man, but the lower animals also. For what is gained by experience or education in the parent sometimes becomes, by hereditary transmission, *instinctive*, intuitive, innate, primitive or congenital, in the offspring; and we have already seen that hereditary habit, the fruit of experience and instruction of very ancient date, is often mistaken for instinct* [Ex. the Migrations of Birds of Passage; and Bird-nest-construction].

It is impossible, I think, to study even so meagre an outline as I have just given, of the mental qualities or aptitudes of the lower animals, without agreeing with those authorities [such as Leroy, Menault, and Jesse]—who have devoted themselves to the observation of the habits of these animals—that they possess those combinations of mental endowments or acquirements popularly known in and by man as wisdom, sagacity, intelligence, intellect, sense, thought, judgment, prudence, discrimination, shrewdness, knowledge, learning,—illustrations whereof are to be found especially in the dog, horse, elephant, ant and bee. The same sorts of *ideas* appear to pass through the animal, as the human, brain; there is the same kind of arrangement of *arguments* and the same sort of *conclusions*. The assertion of Jesse is probably nearly, if not strictly, correct—that "There is not a faculty of the *human* mind, of which some evident proofs of its existence may not be found in *dogs*" (p. 144). Dr. John Brown goes quite as far when he asserts—"I differ from Professor Ferrier in thinking that the dog has the *reflex ego*, and is a *very knowing* being."†

In his criticisms on the mental endowments of animals, it has hitherto been too customary for man to commit the error of looking for *modes of expression* or exhibition of their faculties of mind similar to his own. In doing so he utterly forgets that there is a "radical difference between their system of knowledge and ours;"‡ and that there are various marked differences in the structure and functions of other animals that cannot fail greatly to modify the forms of expression of

* "Nature," January 5, 1871.

† Chapter on "Our Dogs" in "Horæ subsecivæ," p. 480.

‡ Leroy, p. 55.

their mental qualities as compared with the phenomena of the *human* mind. While he has no difficulty in admitting the existence of bodily species, he forgets that animals are equally capable of division into *mental species*—necessarily differing more or less from each other. Phrenologists make allowance for this difference between man and animals. They recognise the existence of certain “primitive faculties” in one kind of animal and not in another; and the variation of the same primitive faculty in the two sexes of the same species.* It is quite absurd to suppose that no *ideas* exist but *human* ones.

Most important, perhaps, of these structural and functional differences between man and animals is the want in the latter of the power of *articulate speech*. We have seen that under training—mainly as the fruit of attention and imitation—the dog and parrot may be made to utter words, or even phrases. But such a phenomenon is altogether unusual, and scarcely forms an exception to the rule that animals, lower in the scale than man, cannot express their ideas by oral speech similar to his. Most writers are agreed that the possession of the power of speech is a peculiarly human characteristic. Goodsir, for instance, very properly regards speech as an essential of the constitution of man (p. 367). Huxley, with Cuvier, believes that articulate speech is “the grand distinctive character of man” (p. 103); and the importance of its possession is illustrated by his further belief that “a man born *dumb*—notwithstanding his great cerebral mass and his inheritance of strong intellectual instincts—would be capable of few higher intellectual manifestations than an ourang or a chimpanzee, if he were confined to the society of *dumb* associates” (p. 102).

Nearly, if not quite, of equal importance in relation to the mode of expression of the animal mind is the absence, in the lower animals, of hands†—fingers and thumbs. They have no tools save natural ones; they cannot, therefore, *write or print*; they are unable to record their ideas or experience; and hence there is no accumulation of knowledge—which in man is the result on the one hand of the power of speech, and on the other of the accomplishment of writing and printing. The important bearing of the want of a hand is illustrated in the opinion long ago expressed by Helvetius, and quoted by Lord Brougham (p. 285), that “if the arm of man had chanced to terminate in the foot of a horse, he would still have been found wandering about as the tenant of the woods;”

* Combe: vol. i., pp 160 and 171.

† *vide* Sir Chas. Bell on the Human Hand; and Goodsir, p. 366.

and more recently Leroy has expressed his conviction that "had men been without *hands*, all their intelligence would never have led them to the invention of the arts" (p. 109). Modern archæologists aver "that if man had never become acquainted with *metals* he would have remained for ever in his originally savage state;"* in other words had he not had fingers to form and use tools—to manipulate and experiment.

"Having no means," then, says Lord Brougham (p. 288), "of communicating with animals, we are reduced to *our* observation only; and then we naturally draw the inference that because the same things done by ourselves would be known by us to be done from certain mental powers, therefore we ascribe those powers to the animals." Leroy pointed out that animals have, on the one hand, *limited wants*, and, on the other, *limited means* for supplying them; while Menault has shown that their intelligence is in harmony with their organisation, wants, and feelings: they adapt their organs and capacities to their "circumstances" just as thoroughly as *we* do. If we bear in view the wonderful differences of individual, species, genus, family, throughout the animal kingdom—in structure, functions, idiosyncrasy, habit; and the equally remarkable changes produced by external circumstances such as climate, abundance or deficiency of food, the presence or absence of man and so forth, we may be quite disposed to feel and exclaim with sarcastic Pope—

"There's some *peculiar* in each leaf and grain;
Some unmarked fibre or some varying vein.
Shall only man be taken in the gross?
Grant but as *many kinds of mind*† as moss."

The general result of my own investigations is the conviction that certain of the lower animals possess *mind of the same nature as that of man*; that there is no mental attribute peculiarly or characteristically human; and that there is, therefore, no essential mental distinction between man and other animals.‡

* Figuiet's "Primitive Man," English Translation, 1870, p. 205.

† If there are not many *kinds* or forms of Mind, there are at least many different forms or modes of its *manifestation or expression*.

‡ I am not to be understood as asserting that there are no mental *differences* between other animals and man. The object of the present paper, however, has been to indicate the general *resemblances*, not the special *differences*, between the respective mental systems of man and lower animals. Before enumerating or discussing the points of *distinction*, I would commend to the reader the consideration of the remarkable *differences* in intellect and morals, that characterise the educated as contrasted with the uneducated person, the civilised with the *savage* race, the adult with the child, the sane with the insane or idiotic individual, even the male with the female—*among mankind!*

My creed may be fitly expressed by the following quotation from Huxley (p. 109), viz., that “No absolute *structural* line of demarcation wider than that between the animals, which immediately succeed us in the scale, can be drawn between the animal world and ourselves; and I may add the expression of my belief that the attempt to draw a *psychical** distinction is equally futile; and that even the highest faculties of feeling and of intellect begin to germinate in lower forms of life;” “not being able to appreciate or conceive of the distinction between the *psychical* phenomena of a chimpanzee and of a Bosjesman, or of an Aztec with arrested brain growth, as being of a nature so essential as to preclude a comparison between them, or as being other than a *difference of degree*.” In other words, just as he speaks of the *structural* “*unity of man with the animal world*”—so may we speak, in the true spirit of modern science, of their *mental unity*.

“Who, after this, will dare gainsay
That *beasts* have *sense* as well as they?

Thus, by examples clear and plain,
We, for these poor creatures claim
Sense to think, reflect and plan,
And in their actions *rival man;*
Their guide not *instinct blind* alone,
But *reason, somewhat like our own!*”

III. *Bibliographical References* (to the best modern Works or Papers that treat of the *Mental Endowments of Animals*).

(*I have designated by an asterisk [*] the works or papers which have been more specially studied in reference to my present inquiry*)

- *1. “The Intelligence and *Perfectibility* of Animals from a Philosophic Point of View :” by Charles George Leroy. 1870.†
- 2. “The *Reasoning Power* in Animals :” by the Rev. J. S. Watson, M.A. 1870.
- 3. “The Nature of Man identical with that of other Animals :” by Julian. 1870.
- *4. “Contributions to the Theory of Natural Selection :” by A. R. Wallace, F.R.S., 1870. Chapter on “*Intellect* of Savages and of Animals compared.”
- *5. “Scenes and Studies :” by Captain Clayton. 1870. Chapter on “The possible future existence of the so-called Brute Creation.”
- *6. “The Indifference of Animals to Speculative Truth.” “Spectator,” Nov. 26, 1870.

* Geoffroy St. Hilaire made an attempt to establish a human kingdom, in the Zoological scale, on *psychical* qualities; an effort which Vulpian and Cauvet smiled at as “le dernier terme de l’admiration de l’homme pour l’homme.”

† Leroy was one of the Rangers of the Forests of Versailles and Marly, near Paris. He lived in the middle of last century, and wrote, under the pseudonym of “The Naturalist of Nuremberg,” a series of letters “On the Perfectibility of Animals.” These letters, translated, with certain additional chapters, are what are now published in this country.

7. "De l'Intelligence;" by M. Taine. 1870.
- *8. "Chambers' Miscellany," revised Edition, 1869-70.
 Vol. I. Anecdotes of Dogs.
 " II. " the Horse.
 " IV. " Ants.
 " V. " Spiders.
 " VII. " Elephants.
- *9. "Gulstonian Lectures on the Relations between Body and Mind; and between Mental and other disorders of the Nervous System;" delivered at the Royal College of Physicians, London, in 1870, by Professor Maudsley. "Lancet," Vol. i. for 1870. Subsequently published separately under the title "Body and Mind."
10. "Bible Animals;" by the Rev. J. G. Wood, F.L.S. 1869. Also the previously published "History of Mammalia," by same author.
- *11. "The Intelligence of Animals;" by M. Menault: translated from the French, 1869.
- *12. "Anatomical Memoirs" of the late Professor Goodsir. 1868. Chapters on "The Nature of *Animality*" (Vol. 1, p. 211): on "Life and Organization," with long and important Note on "Psychological Science," (p. 307); and on the "Essence of *Humanity*."
- *13. Chambers' Encyclopædia, 1860-8. Articles on Instinct, Elephant, Camel, Horse, Dog, Bee, Ant, Cat.
- *14. "On Intelligence and its Relation to Instinct;" by M. Coudereau. Translated in "Anthropological Review," 1868. (Vol. vi.)
- *15. "Anecdotes of Dogs," by Jesse. 1867.
- *16. "The Relation of Man to the Inferior forms of Animal Life;" by Chas. S. Wake, "Anthropological Review," 1863, (Vol. i. p. 366).
- *17. "Difference between Man and the Lower Animals;" by Theodor Bischoff. Translated in "Anthropological Review," 1863, (Vol. i. p. 54).
- *18. "Evidence as to Man's Place in Nature:"† by Professor Huxley. 1863. Section II. on "The Relations of Man to the Lower Animals."
- *19. "The Genesis of Mind,"‡ by Professor Maudsley: "Journal of Mental Science" for January and April, 1862. [Nos. 40 and 41. Vols. vii. and viii.]
- *20. *Horæ Subsecivæ*." by Dr. John Brown. 1861. 1st Series, story of "Rab and his Friends;" 2nd Series, chapter on "Our Dogs."
- *21. "Dialogues on Instinct,"§ by the late Lord Brougham. Vol. VI. of his General Works. 1856. Chapters on "Animal Intelligence."
- *22. "Manual of Zoology," by M. Milne-Edwards: adopted by the Council of Public Instruction in France; English translation by Dr. Knox, 1856; chapter on "Intelligence and Instinct," p. 151; and section on the "Faculties of the *Understanding* in Animals," p. 172.
- *23. "System of Phrenology," by the late George Combe, 5th ed., 1853. Chapter on *Comparative Phrenology*," (Vol. ii, p. 382.)

† Has already reached three editions.

‡ Not until *after* my present Paper was sent to press—not, therefore, till my own inquiry was concluded—was my attention drawn to this important contribution to Comparative Psychology, by Professor Maudsley. From a somewhat different point of view, pursuing a perfectly independent line of research, he had arrived at conclusions that substantially agree with my own. His paper contains a number of interesting illustrative anecdotes: it enters into a comparison of the mental condition of the lower animals with that of children, savages, idiots, and other classes of the insane or uneducated; and it contains so much matter of a most suggestive kind that I would strongly recommend the student carefully to peruse his essay in connection with my own. The fact that so accomplished a psychologist should have arrived, from an independent course of inquiry, at similar results, gives me greater confidence in urging the conclusions embodied in my present essay on the attention of all students of the wide and perplexing domain of mind: not as dogmatically enforcing their acceptance, but simply as pleading for due consideration in the form of *further inquiry*.

§ Of this admirable work there are several editions.

- *24. Bridgewater Treatise, on the "History, Habits, and Instincts" of Animals: by the Rev. Wm. Kirby; edited by Professor Rymer Jones. † 1853. Chapter on "Instinct" in general, (Vol. ii. p. 162.)
25. "Psychological Inquiries," by the late Sir Benj. Brodie. 1854.
26. "Insect Architecture," edited by 'has Knight. 1831.
- *27. "Introduction to the Modern Classification of Insects," by J. O. Westwood, F.L.S. 2 Vols. 1840. Sections on the Habits of Bees, Vol. ii, p. 280; Ants, Vol. ii, p. 221; Wasps, Vol. ii, p. 245.
28. "History of British Quadrupeds," by Professor Bell. 1837.
- *29. "Canine Pathology," by the late Professor Blaine. 1817. Introductory chapter on the "*Moral Qualities of the Dog.*"
30. "Enquiry into the Nature, Order, and *Government* of Bees," by Thorley. 1744.

The following I cannot arrange among the foregoing by reason of my ignorance of their dates of publication:—

31. "Topics of the Day," by Hingeston. Chapter on the "Cerebral Functions of Animals."
32. "Biographical Sketches of the Horse," by the late Capt. Thos. Brown.
33. "Gleanings of Natural History," by Jesse.
34. "Records of Animal Sagacity and Character;" and also "Dogs and their Doings;" both by the Rev. F. O. Morris.
35. "The *Education* of the Dog," by M. de Tarade.
36. "Animal Sagacity," by Mrs. S. C. Hall.
37. "*Humanity* of Brutes," by Youatt.
38. "Clever Dogs, Horses, and other Animals," by Shirley Hibberd.
39. "Cassell's Book of Birds."
40. "Illustrations of Instinct," by Crouch.
41. "On the *Affections* of Animals," by Oscar Honoré.
42. "Philosophy of Natural History," by Smellie.
43. "Sur les Mœurs des Fourmis indigènes," by the two Hubers; abounding in illustrations of *Reason*.
44. "Zoonomia," by Dr. Darwin. Section on *Instinct*.
45. "Instinct and Reason," by Alfred Smee, F.R.S.
46. "Treatise on Human and Comparative Phrenology," by Dr. Vimont. Includes a chapter on the "Cranioscopy of Animals."

There are, moreover, a number of comparatively old—certain very old—books in which the student will find many interesting references to the habits of animals, or to the puzzling relations of Instinct to Reason. Thus the Bible contains many illustrations of the mental peculiarities, or of the habits, of the locust, ant, spider, cony, lion, goat, greyhound, horse, ass, eagle, and other animals (*e.g.*, in Job xxxix and xli; Proverbs xxx, 24-31; Joel i, ii. 2-10). † Among ancient writers, Plato, Helvetius, and Plutarch, and among more modern authorities, Bacon, Buffon, Montaigne, Locke, Berkeley, Huber, may be quoted as having directed some attention to a problem which perhaps yet remains to be satisfactorily solved—the determination of the *Nature of Mind in the Lower Animals*.

† There are also several editions of this, as of the other excellent "Bridgewater Treatises."

‡ See also Bib. Ref. No. 10 ("Bible Animals.")