The Pathology 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 a paper on "The Physiology of Mind in the Lower Animals," in the *Journal of Mental Science* for April, 1871 (p. 79), I endeavoured to prove that other animals than man possess the same kind of moral and intellectual endowments and apply them to the same practical purposes that he does. The object of the present paper is to show that Mind in the lower animals, or certain of them, is liable to be affected by the same *causes* of disturbance—is subject to the same *forms* of defect or disorder—as in man.

The phenomena and causation of moral or intellectual deficiency or derangement in the domestic animals at least—those that subserve so many of his purposes—ought to possess the highest interest to man; for a knowledge of them is of the utmost importance to his own welfare. But there are probably few subjects concerning which he is more ignorant and indifferent. In the very outset of our inquiry, and, indeed, as its *raison d'être*, it is desirable to set forth some of the *results* to man himself—as well as to the animals implicated—of man's ignorance of the various forms of mental impairment in other animals, and of the causes producing such impairment. The two grand results, so far as *man* is concerned, are—

1. Danger to human life; and—
2. Pecuniary loss.

Of these two considerations, unquestionably that which will prove most influential in securing for the subject of insanity in the domestic animals some degree of attention is the latter—*the cost in cash* of such disability to man.

Pecuniary loss to man from animal insanity, and from his ignorance of its nature and of the means of preventing and removing it, occurs in two very common forms—by the

1. Accidental death; or—
2. Deliberate destruction by man—of valuable animals—dogs, horses, or cattle.

Insane animals meet with—rush upon—accidental death, sometimes wholesale, in a considerable variety of ways. In their panics or stampedes they court the deadliest dangers,

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perishing sometimes—for instance, in the case of sheep—by scores. They murder each other, commit suicide, and so mutilate themselves or their fellows that speedy or lingering death results.

On the other hand, man commits with the utmost deliberation—by municipal edict in some cases—wholesale havoc among animals that are merely *suspected* of being "mad," whatever be the nature of their alleged madness. He poisons, shoots, or drowns kennels of hounds that are supposed to be rabietic, or that may possibly become so; nay, he goes so far as to put out of existence hundreds of dogs in a single city simply because of his ignorant, superstitious, unfounded dread of what is very much a mere bugbear—Hydrophobia. A signal example of this kind of human stupidity on a large scale occurred lately in the case of the city of Glasgow—the second in point of population in the empire. Three deaths in man had occurred within a few weeks of each other in two hospitals—the Royal and Western Infirmaries—from what was called hydrophobia attributed to dog-bites. But, in the first place, so rare is hydrophobia in Scotland—so few of its medical practitioners had ever seen a genuine case, the result of the inoculation of the specific virus from a rabietic dog—so little idea is there even among the medical profession either in North or South Britain of the distinction between real and *spurious* Hydrophobia,* that it cannot be said there was anything like sufficient proof that the fatal cases in man alluded to were genuine hydrophobia. Nor was there any satisfactory proof that the persons who died with symptoms of or resembling those of hydrophobia, were bitten by dogs at all; or that when bitten, the dogs themselves were really rabid—affected with rabies, or in any other sense mad.

Nevertheless, a popular panic followed the deaths in question: a vivid imagination conspired with ignorance and superstition to create the belief that rabies was rampant; that danger to human life from dog-bite and hydrophobia was necessarily and equally so; and that the only means of safety—of preventing or stamping out the disease and its cause in man—lay in the destruction of all the stray dogs of the city. "An official return shows that the number of dogs taken charge of by the Glasgow police during the recent crusade was 1,295, and that of these, 1,155 were killed."†

* On this subject see what I have said in a paper on "Madness in Animals," in the "Journal of Mental Science" for July, 1871, pp. 185-193.

† "Scotsman" of November 13, 1876; and 'British Medical Journal" of November 16, 1876, p. 663.

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Such a "massacre of the innocents" bids fair, and well deserves, to figure in all future histories of *Popular Errors and their Results.*

For, such a slaughter was the result of error—and the error was the result of ignorance and superstition, imagination and panic. Professor Macleod, of the University of Glasgow, publicly stated after the said panic and massacre, "There is a huge lot of nonsense talked about hydrophobia, and people need not be in the least afraid of it." If the people, as a whole, could and would only believe this—which is true; were they convinced that, as I have pointed out elsewhere, rabies in the dog and hydrophobia in man are equally rare,* and that in nine cases out of ten what are so called rabies and hydrophobia are erroneously so called, they would be quite easy in their minds concerning dogs and dog-bites; there would be none of that morbid fear and fancy that, in conjunction, produce the *spurious* disease in man—a spurious disease, be it observed, that is quite as fatal frequently as the real one. In fact, man will be a great gainer when he can realise the part played by *fear* and *fancy*—morbid in their character, and begotten of ignorance, prejudice, and superstition—in the genesis of the most dreaded and fatal of human diseases, especially of the epidemic kind.

Very slowly indeed, however, are even medical men in becoming alive to, or aware of, the fact that many fatal diseases, such as cholera, hydrophobia, and tetanus, owe their origin and their fatality, not to any blood-poisoning—not to the introduction from without of any disease-germs, figurative or real, but simply to *imagination.* Quite lately Dr. Messer, of H.M.S. "Pearl," has been pointing this out as regards the tetanus resulting from supposed arrow-poison. He shows that the wounds inflicted by poisoned arrows in the South Sea Islands are followed not by blood-poisoning—not by any specific disease traceable to the supposed "poison"—but by a series of morbid mental and motor symptoms; the first including Fear, Mental Excitement, Nervousness, Superstition, Suspicion, Delusion, and actual Insanity; while the second embrace Hysteria and Tetanus, preceded by morbid Sensations. Further, he proves that the so-called "poisoned" arrows are really not poisonous, and that their supposed poison cannot produce Tetanus.

* *Vide* Paper on "Madness in Animals," p. 185.

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Nor are such mistakes in popular practice as those connected with the slaughter of hecatombs of dogs that, if permitted to exist, might some day or other become rabid, bite a man or child, and so give rise to human hydrophobia—confined to Glasgow. They are or have been committed also in London, though not perhaps on such a scale. The *Times*, writing in June, 1874, on Canine Rabies, says:—"A dog which is thirsty and bewildered is almost certain to be condemned as rabid, even although there may not be a particle of evidence to justify the charge. During the last few weeks we have had to record several groundless alarms of this description; and many dogs—probably none of them mad—have been destroyed." In fact, the Police Returns showed that sixty-seven dogs—reputed to be mad—were destroyed within the metropolitan district alone between 1st January and 31st May, 1874. A sheep worried by one of these sixty-seven dogs "is said to have died of rabies five weeks afterwards. In the other sixty-five cases there was no evidence of madness (in the dogs) beyond the fact of the accusation!" Commenting on this, Berkeley tells us (in his "Fact against Fiction")—"The probabilities are that not one of the dogs was either mad, or in the slightest danger of becoming so; and that, if they had been shut up and watched for a time, the symptoms which gave rise to the belief would have been found to admit of some different interpretation."

Great, however, as is popular ignorance concerning the etiology and symptomatology of insanity in other animals than man, and even, indeed, in man himself—and serious as are the results of such ignorance equally to man and other animals—so much is already known of the causes and forms of mental defect or derangement in such animals as the dog, horse, and elephant, that the subject of animal insanity is much too vast and important for treatment in a single paper. All that can be fitly attempted at present is to *outline* the subject in order to give a general idea of its extent and importance, reverting by and by to the discussion of specially interesting details.

Generally, then, it may be stated that insanity in the lower animals is virtually the same as that of man—in so far as concerns—

1. Its Etiology or Causation.
2. Its Symptomatology and Forms, including its Prodromata, or early—apt to be unobserved—stages.

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3. Its Diagnosis and Prognosis, with their difficulties.
4. Its Duration and Terminations.
5. The Principles of its Treatment.
6. Its Curability and the tendency towards recovery.

But there are certain peculiarities in the case of the lower animals, the most important of which is the facility with which *artificial insanity* may be produced in them by means, for instance, of—

1. Ill-usage; or by
2. Brain or Blood-poisoning—by the Alcohols or by various Narcotics or Irritants, fluid, solid, or gaseous.

Hence in many animals the whole course of insanity—its genesis, symptoms, and terminations, as well as the means of controlling it, and its morbid anatomy and histology when a fatal issue has been produced or permitted—may be conveniently studied. And hence, also, the value of such a form of *pathological experimentation*, as yielding results calculated to throw light on the Natural History of Insanity in man.

In connection with this aspect of the question—the *artificial production of insanity* in the lower animals, and the results that may be expected to accrue to psychological and pathological science from a careful study of the insanity so produced—while it may be shown, on the one hand, what we already know concerning mental and moral defect and disorder in these animals, it may, perhaps, much more easily be indicated, on the other, how much we have still to learn. There are, indeed, numerous *problems* of the most interesting kind awaiting solution connected with the physiology as well as the pathology of mind; and if such problems are to be solved at all, it will probably be by *experimental study* of the phenomena, both normal and abnormal, of mind in the lower animals. The problems in question are of very various character and value, as the following illustrations may suffice to show:—

1. The connection, if any, between mental conditions, and changes in the structure or composition of the brain, spinal cord, or other portions of the nervous system.
2. The relative frequency of insanity or its special forms in domesticated, as compared with wild, animals, or in domesticated and wild individuals of the same species.
3. The relative liability of sex and age to insanity, or certain forms thereof.

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4. The nature of the morbid influence of the human breath on certain insects.

5. The *modus operandi* as excitants of certain smells (or odours), and colours.

6. The nature of barking or baying at the moon by dogs or other animals.

7. The true character of the "madness" of "March hares."

8. The causes—if causes can be said to exist—of many morbid antipathies.

9. The relative frequency of insanity, or certain of its forms, in different—

(*a*) Individuals.
(*b*) Breeds or races.
(*c*) Species; and
(*d*) Genera.

10. The results of artificial breeding and life in relation to the genesis of insanity, or a predisposition thereto.

11. The hereditary transmission of morbid moral or intellectual qualities or conditions.

12. The comparative frequency of human and animal insanity under the same or similar circumstances; and of—

13. Animal insanity in earlier and later times.

14. The nature and cause of migrational excitement.

I have on several former occasions expressed the opinion*—and I cannot repeat it too frequently or emphatically—that the study in a scientific spirit of the pathology of mind in the lower animals offers a far more promising *field for original inquiry* than any other department of so-called "Psychological Medicine." And I am glad to find that some of our most eminent naturalists and mental philosophers are now expressing opinions of a similar kind. Thus Dr. Carpenter says, "Scientific study of the various forms of abnormal mental activity . . . . . rightly cultivated, is probably the most promising field of Psychological Inquiry.'† These views are shared by Professors Huxley and Maudsley, of

* *Vide* Pamphlet on (1) "The Physiology and Pathology of Mind in the Lower Animals." Edinburgh, 1871; and papers on
(2) "Insanity in the Lower Animals," in the "British and Foreign Medico-Chirurgical Review" for July, 1871.
(3) "Community of Disease in Man and other Animals." *Ibid.*, January, 1874.
(4) "The Transmission of Disease between Man and the Lower Animals." "Edinburgh Veterinary Review," July, 1858.

† Preface to his "Mental Physiology." 1874. P. ix.

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London; Bain, of Aberdeen; and Youmans, of New York—as I have reason to believe—in some cases from their published avowals,* in others from their written correspondence.

There are many energetic young medical men connected with our specialty longing for distinction, to whom such a field is invitingly open. If they would but betake themselves to the study of *Comparative Psychology*, and to that department thereof especially which relates to *Mental Pathology*, they would find a new and wide—almost inexhaustible—opportunity not only of distinguishing themselves, but of adding to human knowledge, and thereby to human, as well as animal, happiness and well-being. Let me then commend the experimental and scientific study of the pathology of mind in the lower animals—in some of its many departments or details—to those capable youths who at present fritter away their time, temper, and opportunities on subjects that are both trite and trivial; who expend their ingenuity in improving upon Nature by drawing hard and fast lines of demarcation where she draws none; who have a genius for the coinage of new and puzzling terms, the addition of which to the already bewildering terminology of comparative psychology only makes "confusion worse confounded;" who devote so much energy to fruitless, and, perhaps, undignified squabbles concerning the classification or nomenclature of the insanities of man; who report flippantly of cures due to their skill that are more probably temporary recoveries in spite of their interference—triumphs of the *vis medicatrix Naturæ* over the *Nimia diligentia* of unscientific medicine; who describe, as characteristics of insanity or the insane, conditions of the brain that are to be found—if looked for with the same care and desire—in the sane inmates of any large poorhouse or hospital—conditions that cannot claim even, in some cases, to be considered morbid; who discover in the last fashionable drug, or mode of drugging—apparently just because it is the last and most fashionable—a panacea for all the ills of the insane; who delight in barren statistics that have already been tabulated a thousand times with results of no practical value; or whose *cacoëthes scribendi* has deluged psychological literature with a *rudis indigestaque moles* of useless or mischievous speculation.

Unfortunately, in commending experimental investigations concerning even the mental faculties of, or mental conditions

* Thus Professor Huxley's opinion has been given in my paper on "Insanity in the Lower Animals." (Foot-note to p. 3.)

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in, the lower animals, we are brought at once face to face with the deplorable "Vivisection Act" of last session.* The direct tendency and effect of that Act—which was the result of a weak pandering to popular prejudice—is to degrade science, to interfere with scientific progress, and the accumulation of knowledge of a kind calculated to be beneficial to man and his subject animals in a thousand ways. For myself, though I see numerous paths of experimental research opening up before me, and inviting me to enter upon them, and though some of these investigations would have for their subjects such vermin as rats or mice—such cage birds as parrots and starlings—such inmates of domestic aquaria as gold and other fish—all of which are vertebrates—I am debarred from engaging in them by reason of my reluctance to take out a "licence," and so subject myself to the inquisitorial indignities and degrading penalties imposed by a misguided Government. But there may be many younger men, with equal desire for original research, more happily circumstanced as to a Government "licence," or as to a willingness to take advantage thereof: and to them I again commend a kind of inquiry upon which I cannot myself—for the present, at least—enter.

At one time (in 1853), when, in conjunction with the late Dr. Warburton Begbie, I was in medical charge of the City Cholera Hospital of Edinburgh, I had a comparatively extensive *experimental* establishment. There were two large buildings of several storeys—one of them quite empty, the other nearly so—with ample grounds and outhouses, placed at my disposal. These buildings and their appurtenances contained abundance of suitable accommodation for laboratories of *experiment*, as well as of research; and accordingly, in addition to apartments at the top of the house, well lighted, and devoted to microscopical and chemical research, I had others on the ground floor occupied by animals that were the subject of several distinct lines of experiment, including—

I.—Cholera—artificially produced, and studied in all its stages.

II.—The antagonism of medicines and poisons; and—

III.—The difference in action of the same medicines or poisons in different animal species and genera.

The animals selected for the purposes of experiment were

* "The Cruelty to Animals Act," 1876.

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mostly wandering, homeless street dogs of the kind lately and literally drowned "by the thousand" in Glasgow because they might, had their lives been spared, have become rabid and bit people;—drowned without their lives or deaths being of the slightest use to science or thereby to mankind. The existence of my animal hospital and experiments was well known to the late Sir Jas. Simpson, Professor Syme, Professor Alison, Professor Hughes Bennett, and other then living celebrities of the Edinburgh medical world. But these gentlemen did not give me the benefit even of their moral support or approval. Nor could they; inasmuch as some of them, if not all, ridiculed the idea of expecting to find the diseases of other animals comparable, and still less identical, with those of man! The consequence was, that popular and professional rumour having partly misrepresented, partly misunderstood the aim and character of my experiments, a dread that threatened to take practical shape arose among the patrons of the hospital of which Dr. Begbie and I had charge as physicians—he as senior and non-resident and I as junior and resident—these patrons being the august Town Council of Edinburgh. And this dread, with the action to which it was likely to give rise, led me abruptly to bring my experiments to a close, not, however, before I had accumulated many results, some of which were soon afterwards published both in France, England, and Scotland. So far as concerns the *cholera* experiments, Dr. Warburton Begbie, who had studied them in the various stages of their progress, in giving an account of the Transactions of the City Cholera Hospital in 1855,* described them as "having first exhibited the communicability of cholera to the lower animals, and so determined the contagious nature of cholera."

The animal species and genera in which various forms of mental peculiarity, defect, or disorder have been noted by different observers—veterinarians, physicians, travellers, or naturalists—are considerable, both as to number and variety, including as they do among the *Mammalia*—

1. *Quadrumana:* the Gorilla; Orang; Mandrill, or other baboons; the Araguata, Titi, Capuchin, or other monkeys; certain apes; and the Lori.
2. *Ungulata:* The Horse; Mule; Ox; Goat; Pig; the Moose, and other kinds of deer; the Chamois; Sheep; Hippopotamus; Buffalo; Quagga; Gnu; Camel; and Dromedary.

* "Edinburgh Medical and Surgical Journal," January, 1855.

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3. *Carnivora:* The Dog; Cat; Fox; Wolf; Tiger; Ocelot; Ferret; Badger; Brown or other bears.
4. *Proboscidea:* The Elephant.
5. *Rodentia:* The Rabbit; Hare; Common Rat; Hamster; Beaver; Guinea Pig.
6. *Marsupialia:* The Tasmanian Devil, and Wombat.
7. *Insectivora:* The Hedgehog, and Mole.

In other classes of the *Vertebrata,* we have yet to look for indications or examples of mental defect or derangement among *Pisces, Amphibia,* and *Reptilia.* But among the *Aves,* on the other hand, there are many instances, including the—

Parrot.
Chilian Sea Eagle.
Clawed Harpy Eagle.
American Goatsucker.
Australian and British Magpies.
Common Raven.
Jackdaw.
Indian Crow.
Sparrow Hawk.
Piping and other Bullfinches.
Canary.
Turtle Dove and other kinds of Pigeon; and
Common Fowls or Poultry.

Among the *Invertebrata,* the only signal illustrations of mental excitement and aberration are to be found in the class *Insecta,* of the sub-kingdom *Annulosa,* and in the order *Hymenoptera*—in Ants and Bees. But if we regard *alcoholic intoxication* as involving morbid mental phenomena, or phenomena thereto allied, and inebriation as a kind of temporary mental derangement, we meet with abnormal psychical conditions as low in the zoological scale as the *Medusidæ* belonging to the sub-kingdom *Cœlenterata.* For, quite lately, Romanes has shown that the outward phenomena of tipsiness may be artificially produced in the common *Medusæ* of our coasts.*

Referring to the foregoing list of animals in whom, by various authors, conditions of mental peculiarity, excitement, depression, want, or disturbance have been observed, it has to

* He read a paper on the *Medusæ,* describing *inter alia* their experimental intoxication, at the British Association in Glasgow in 1876; as reported in the "North British Daily Mail" of September 13, 1876.

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be explained that these conditions are most diverse in their nature, according, sometimes, to the *genus or species* affected, sometimes to the producing *cause*. Thus, in the dog, the commonest form of insanity is that of *rabies;* but ordinary mania and melancholia are also frequent. In the horse and ox it is *ephemeral mania* that usually attracts notice, and leads to the adoption of hasty and unnecessary measures for the destruction of the animals affected. In such birds as the magpie, the usual form of mental or moral perversion is *kleptomania*, the theft of articles utterly useless to the animal. In various *young* animals—dogs and cats especially, for they are seldom permitted by man or their fellows to grow to maturity—there is sometimes simply mental want or defect, congenital in its origin, and amounting in some cases to *idiocy*, while it embraces all the shades of fatuity or *imbecility*, marked in all cases by inability to provide for themselves.

In the catalogue of animals above given, both *sexes* and all *ages* are represented; as are also *wild* and *domesticated* individuals, species, or genera, with pet and menagerie animals. Sometimes one sex, sometimes another, is more specially affected by this or that form of insanity, so that at present it is impossible to say whether, on the whole, males or females are most liable. For, while *females* are more impressionable than males, in connection with such functions or conditions as pregnancy and parturition, the *males* are more subject to the excitement of the rut: so that in them—in the stags or bucks, for instance, of various deer, including the red, fallow, and roe deer—*erotomania* is most frequently developed.

The *causes* of mental defect and disturbance among the lower animals are almost infinite, as varied and numerous nearly as those of human insanity; because, if certain causes be held peculiar to man, there are certain others equally entitled to rank as characteristic of other animals. In general terms it may be asserted, in the first place, that all the causes of other and ordinary bodily diseases, and especially of those of the brain and nervous system, along with such diseases themselves when developed, are to be regarded as conducing to animal as to human insanity. I have shown elsewhere* to how many human diseases other animals are liable, from how few—if any—they are exempt. Here it may

* *Vide* papers on (1) "Community of Disease in Man and other Animals," "British and Foreign Medico-Chirurgical Review." January, 1874. (2) "The Transmission of Disease between Man and the Lower Animals," "Edinburgh Veterinary Review." July, 1858.

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suffice to enumerate such nervous affections—involving motion as well as consciousness—as apoplexy, epilepsy, catalepsy, chorea, hysteria, convulsions, and paralysis. Conducing equally to abnormal mental and bodily conditions, and to the one through the other, are :—

1. All kinds of *want:* of food, water, sleep, fresh air, exercise, occupation, recreation, society, light, gratification of instincts.
2. All sorts of *excess:* of food; emotion or passion, such as anger or grief, rivalry or jealousy, fear or fright, joy or expectancy, anxiety or despair; heat or cold, gratification of instincts.
3. All forms of *physical exhaustion*—however produced—as by overwork.
4. All other kinds of *ill-usage*, suffered at the instance of man.
5. All kinds of *bodily pain*, or suffering, such as that of toothache.
6. Certain *physiological or pathological conditions* or changes, such as incubation, sterility, or moulting.
7. *Surgical* or other *mutilations* of organs, such as castration.
8. *Wounds*, accidentally or intentionally inflicted, such as from blows on the head.
9. Animal, or other *poisons*, such as those of fly-plagues, or contained in improper food, or in drugs artificially administered.
10. *Predisposition*, temperament, heredity, diathesis.

Of a more special character, acting principally on the mind, are such causes as—

11. *Want of leadership* or government.
12. Sense of *danger*, of homelessness or desertion, of calamity, of suffered wrong.
13. *Nostalgia.*
14. *Braidism.*

Now the reader may classify or arrange such causes in his own way. He may divide them in the orthodox fashion into

1. Those that are (*a*) Predisposing, indirect, or remote; and
   (*b*) Exciting, direct, or immediate.
2. Or that are (*a*) Moral; and
   (*b*) Physical.

I make no such attempt, for a variety of reasons, and among others, that I believe all such classifications to be arbitrary, artificial, and inexact, whether or not they are con-

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venient for the student. It is of much more consequence to point out, in connection with the subject of causation, that—

1. Sometimes there is an *absence*—apparent or real—of all cause, which is tantamount to saying that causation is frequently unknown, however demonstrable the effect may be.

2. Or the *triviality*, or inadequacy, of the cause is remarkable.

3. The *apparent* cause may not be the real one.

4. Certain assigned causes are highly *problematical*, such as lunar influence in other animals, as in man.

5. Frequently there is a *combination*—it may be a complexity—of causes.

6. The *same result* may issue from *different causes:* just as

7. The *same cause* may give rise to *different results.*

8. The cause, where present, may be *obscure*, or *obvious.*

9. What appears to be a cause may in reality be an *effect;* for instance, in the case of nostalgia and intoxication.

10. Many causes are *exceptional*, or peculiar; their nature and operation have not been explained, and are not understood; they, therefore, court investigation.

The commoner *forms* of mental defect, impairment, or derangement, among the lower animals, are the following:—

1. *Original* (or congenital) defect, ranging in degree from slight mental imbecility to *idiocy* (or amentia); and including especially certain kinds of stupidity, for instance, that which renders an animal incapable of education, or of taking care of itself.

2. *Acquired* impairment, of the nature of loss, weakness, weakening, or want of mind, or fatuity, including all shades of *Dementia.*

3. Abnormal or excessive mental *excitement*, culminating in Furiosity and *Mania.*

4. Extreme or inordinate *depression* of spirits, or despondency, of all degrees up to abject *Melancholia.*

5. Perversion of one or more of the appetites, affections, or propensities—what is called in man *Moral Insanity*, including *kleptomania*, *dipsomania*, and *erotomania.*

These forms of insanity include, as in man, aberrations of *speech*, or other forms of language, and necessarily of the *ideas* of which language is the expression. In other words, there are not only *delusions*, expressed by pantomimic language, for instance, in the rabies of the dog; but even *incoherency of speech*, in the senile dementia or in the intoxication of the parrot.

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The forms of insanity mentioned also include what in man is termed *Monomania,** when some prevalent morbid idea, feeling, or impulse takes apparently entire possession of the mind for the moment. Examples are to be found in morbid *fear* or *suspicion*, which amounts sometimes to what, in man, is known as the monomania of fear, or suspicion; *panphobia*, an overwhelming general dread; *morbid impulse*, such as that which leads to *suicide, homicide, or murder* of each other, *mutilation* of themselves or others, or general *destructiveness* both of property and life; *morbid propensity or appetite*, such as that which urges to morbid forms of *theft*, the abuse of intoxicants, and the excessive excitement of the sexual passion, and which gives rise to those forms of insanity usually designated in man, *moral*—to wit, *kleptomania, dipsomania*, and *erotomania*. In the same way it is quite as permissible or proper to speak, in other animals as in man, of suicidal, homicidal, murderous, or destructive mania, or monomania, if, indeed, it be strictly correct to use such terms in either case.

There are, moreover, certain forms of insanity that are *secondary* in their character, developed as morbid mental phenomena in various bodily or general diseases, such as rabies, distemper, sturdy, plague, or epilepsy. Such forms, which are not always minor in their importance, though not primary in their incidence, are frequently spoken of, with no great propriety, as *sympathetic* or *symptomatic*. It is more correct to speak of the insanity of rabies, distemper, sturdy, or plague, or of epileptic mania.

Paralysis is another of the bodily disorders that may accompany, precede, or follow mental defect, or derangement in the lower animals. And paralysis itself may sometimes amount to what ordinary medical or veterinary writers describe as a "general" paralysis.† Thus Dr. Richardson mentions a horse struck by lightning so severely that "it died ultimately from wasting and general paralysis."‡ It has yet to be shown, however, whether in cases of so-called *general paralysis*, in the horse or other animals, there is any association of morbid *mental* conditions, and if so, what is their character, and what the nature of the association. That there is such an association is most likely, but its existence has yet

* Cases are given in my "Illustrations of Animal Reason," p. 141.

† See what I have said on this subject in my paper on "Community of disease," p. 15.

‡ "Diseases of Modern Life," p. 76.

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to be proved. The study of this particular form of association of mental with bodily disorder is of special interest in connection with the subject of what is called general paralysis (or paresis) in the human insane, which I have never been able to regard as the specific disease it is usually represented to be.

And further, certain kinds of insanity—especially those of an emotional character—are apt to become, by imitation and sympathy, *epidemic*.*

Just as in the case of causation, the reader may amuse himself with *classifications* of the forms of animal insanity. He may divide them into insanity of (1) Feeling, (2) Action, (3) Thought; or into the old orthodox mania, melancholia, amentia, dementia, and monomania: or he may attempt to arrange according to causation, real or supposed, and construct his genera and species, with their varieties, almost to an unlimited extent. I make, myself, no attempt at elaborate classification, for many reasons, of the same kind as those that apply to all efforts at the classification of causes; including among other reasons this sufficient one, that in so far as the forms of insanity are frequently as shifting and complex as its causes, all such arrangements are artificial and inexact, however great their semblance of, or pretence at, precision. It is much more important for us to know what forms are *preventable* and non-preventable, and what is the extent of *man's responsibility* in the incidence and development of animal insanity. This opens up the question of *curability*, in regard to which—as to the general *principles of treatment*—there is not much to be said that does not apply equally to human insanity.

Short of insanity, there are, in other animals, as in man, many morbid mental states—including the following:—

1. Changes of character or disposition, including temper changes, such as moodiness, sulkiness, surliness, or general irritability.
2. Changes of habit.
3. Perversion of the affections, especially the maternal.
4. Development of morbid appetite.
5. Mental confusion or bewilderment.
6. Delirium.
7. Volitional defect or disturbance: want of exercise, loss of the power of control, or morbid feebleness of will.

* *Vide* paper on "Mental Epidemics among the Lower Animals," "Journal of Mental Science," January, 1872.

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As in man, too, such mental states frequently constitute the *prodromata*, or premonitory symptoms of insanity; while at other times the mental aberration stops short at this stage. And it is at this early stage more particularly that man has so much in his power in *preventing* insanity in, or in restoring the mental equilibrium of, animals that are so serviceable to him; provided only he understands the significance of such symptoms of threatened—nay, to some extent, of existing—mental derangement.

The following *illustrations* will serve to show the different degrees, as well as kinds, of mental excitement and depression, defect and derangement, that occur in the commoner animals —whether wild, captive, or domesticated—in short, in the different conditions of existence, in both sexes, and at all ages.

The insanity of *rabies* in the dog is of special interest from the occurrence of visual, aural, or other classes of sensorial *delusions*, and from its general resemblance to that of the *delirium tremens* of man. Its phenomena have been described by many authors, medical and veterinary. The following descriptions may be held typical of all, for there is usually little variation in detail. The *Times* (in June, 1874) writes of the rabietic dog in general that it "makes furious attacks upon *imaginary* enemies; or barks or howls in response to imaginary sounds, sniffing at the air, or suddenly barking without apparent cause." M. Bouley, of Alfort, the distinguished French veterinarian, who has made a special study of canine rabies, cautions us to "beware of the dog that . . . . exhibits aggressive movements against *phantoms*." Berkeley (in his "Fact against Fiction") asserts, also in connection with rabies in the dog:—"The canine race are subject to as many *delusions* of the brain almost—not quite—as men and women are." Youatt, again—a thoroughly competent veterinarian—tells us of a rabid dog, that—"In a moment the dog quitted the sofa" (it had been resting), "and, with a furious bark, sprang against the wall as if he would seize some *imaginary* object that he *fancied* was there." . . . He would "watch the nails in the partition of the stable in which he was confined, and fancying them to move, he would dart at them, and injure himself from being no longer able to *measure the distance* of the object." He may "seem to *imagine* that something is lost, and he will eagerly search round the room, and particularly every corner of it, with strange violence and indecision," and Youatt points out, too, that its *delusions* of sight and sound are of exactly the

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same kind as those of man. Youatt speaks also of "the foes that he *fancies* are threatening him on every side."*

Clara Rossiter, in her "Anecdotes of Pets,"† describes a certain kitten as an "oddity . . . apparently not possessing all its senses. It was painfully melancholy, and slept away its whole existence"—dying in infancy. Here probably we have a case of *idiocy*, or congenital imbecility, associated with, or depending upon, some wasting disease of the body. Mrs. Burton, too, speaks of an "idiotic-looking cur . . . . too weak to fight for itself,"‡ in the suburbs of Damascus.

A correspondent of the "Daily Telegraph,"§ narrating the shooting exploits of the Prince of Wales in the Terai of Nepaul, tells us that the tiger is seized "with a mad frenzy in the moment of despair"—as the *Felidæ* in general are. "Wounded and hopeless, he would charge an army, and die tearing at his wounds, if his fangs and claws can find nothing nearer"—on which to wreak his fury. This may be considered an *acute mania*, suddenly begotten by being brought to bay after all the noisy and harassing persecution of the hunt; the mania being characterised by a morbid destructiveness that vents itself on the animal's own person, if there be no opportunity for giving it an outlet on man or other enemies or prey. Other forms of *self-mutilation* are common in other kinds of mental derangement—mostly, however, of the maniacal type.

"The mandrill is liable to terrible gusts of passion, during which it seems to be bereft of reason, and possessed with an insane fury," says the printed official "Guide to Edmonds's Menagerie" (p. 13). This illustrates the very common relation of anger, rage, or *passion* to mania; the one passing into the other so imperceptibly, that it is frequently difficult, if not impossible, to draw the line of demarcation between them.

A cat, which was made for experimental purposes the subject of theine injection, "seemed to be frantic" in its "fits of intense cerebral excitement," a condition in which "it appeared to be extremely susceptible to irritation;" in other words was "easily irritated."‖ The morbid mental condition *artificially* generated would appear to have been extreme excitability, or irritability, culminating in paroxysmal *mania;*

* Work on the Dog, pp. 131-3.
† As quoted in the "North British Advertiser," of Aug. 22, 1874.
‡ "Syria," vol. i, p. 255.
§ Of March 1, 1876.
‖ The late Prof. Hughes Bennett, in the "British Medical Journal," Dec. 5, 1874, p. 697.

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and the condition in question is simply one of many that are artificially producible, and that are too frequently, by man, produced by means and for reasons that cannot always claim the apology of being scientific experiments.

A correspondent of "Land and Water"* thus describes the *migrational excitement* and play of a shoal of new-run salmon in the Clare-Galway river, above Lough Corrib:—"The salmon evidently enjoyed the changing weather; and having indulged in a few playful and delusive rises, got more and more excited till they seemed to have gone simply mad;" sometimes "springing upwards straight into the air to shake off the sea parasites, which still clung about them." Whether this be a mere "revelling in their first re-taste of a fresh-water river," or a desperate effort to get rid of troublesome parasites, such a sort of frantic leaping frequently includes leaping ashore, and wholesale loss of life in consequence.

Capt. Burnaby, in his famous "Ride to Khiva" (1876, p. 83), informs us—"I once rode a camel *in love* . . . He was known by the name of the 'Magnoon,'† or the Mad Camel; but whether, on account of his susceptible heart or not, I cannot say." *Erotic* forms of insanity—the *erotomania* of authors—is better known as it occurs among stags, stallions, and other male animals—to which sex, however, it is by no means confined, for *Nymphomania* is to be met with as well as *Satyriasis*. It is well known that stags in spring are "transported with erotic fury,"‡ and in them the character of this dangerous furiosity is generally recognised. But though it is common to speak of an eccentric man being "as mad as a March hare," the phrase is obviously employed without any intelligent understanding of its meaning, and of the propriety, or rather impropriety, of its application.

An "infuriated ox," in Dundee, in July last, during the hottest weather of the year, in the course of being driven through the city streets, probably to the slaughter-house, is described as at first "becoming frightened, and running down the street at a furious rate . . in its mad career . . . The spectacle was evidently greatly relished by a large section of the younger portion of the community, as the ox was followed by hundreds of young boys and girls."§ This is but

* As quoted by the "Dundee Courier," of Nov. 13, 1876.

† Majnúon is the usual Arabic word—used throughout the East—for a human madman.

‡ "Animal World," July, 1876, p. 98.

§ "Dundee Advertiser," of July 9, 1876.

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an illustration of a very common form of *ephemeral mania*, dangerous to human life—the result of man's injudicious management. Nothing, in such cases, can be more likely to produce mania from morbid terror or mere bewilderment, amid the confusing sights and sounds of a city street, than the raising of the "mad" hue and cry, and the pursuit of what is generally a harmless, and simply frightened, animal with shouts and yells, accompanied by blows, and the offering of formidable-looking obstacles to the poor brute's efforts to reach solitude and silence, in its familiar green fields of any kind.

Burton* describes *melancholia*, or a tendency thereto, as a characteristic of the gorilla in its native state and country,† and *nostalgia* as affecting it on shipboard, and as apt to be fatal. Melancholia, or the minor allied conditions of sadness, apathy, moroseness, despondency, or depression, seem to be common in all the *quadrumana* that are usually brought to Europe for menagerie purposes; and it is noteworthy that this mental condition is frequently, if not always, associated with pulmonary consumption—a disease that, in the whole monkey and ape tribe in captivity in our climates is very fatal.‡ It has further to be remarked that both consumption and melancholia may stand related to the physical element of *cold*§ in our climate, and to the lack of exercise, and the other concomitants of an artificial, unnatural existence, more than to the psychical influence of removal from their native forests and all the freedom of forest life. Burton recommends, in the treatment of the melancholia or nostalgia of the gorilla, the supplying to it, as a companion and valet, of a human native of equatorial Africa. And were companionship and nursing all that are required, more might be said in favour of such an arrangement than may at first sight appear possible. For, however much man may object to regard an anthropoid ape as a "brother," the behaviour of menagerie apes and monkeys, on being visited by negroes, shows unmistakably that they claim kindred with "black men" as their brethren.

In reference to *nostalgia*, too, Miss Gordon Cumming,‖

* "Gorilla Land," Vol. i, pp. 245 and 250.

† But this must surely be after, and as the result of, capture: for how otherwise could its mental condition have been examined, or observed and described?

‡ See what I have said on the subject of *tubercular disease* in the lower animals, in my paper on "Community of Disease," p. 10.

§ *Vide* paper on "The Causes of Insanity in Arctic Countries," "British and Foreign Medico-Chirurgical Review," Jan., 1870.

‖ "From the Hebrides to the Himalayas," 1876, Vol. ii, p. 92.

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speaking of the non-success of all attempts to introduce the camel and dromedary into Europe and America, says that the animals alluded to "seem to *pine* for home, and very quickly droop and die." This pining to death is much more common in animals that are not subjected to any change of climate, or even to any change of scene, but in whom, nevertheless, there is a more or less sudden, unexpected, and complete severance of cherished attachments and associations. In no animal is fatal *marasmus*, preceded by abstinence from food and drink, and produced by the profound melancholia of *grief*, so common as in the dog, from loss of a master, friend, or companion.

The "Animal World"* tells us of a female pet dog that was fond of travelling with her master and mistress, and became delighted at the sight of the preparations for travel, enjoying all the "pleasures of hope." "The sight of carriage or railway made her wild with *excitement*." Indeed, she became "so mad with excitement, that we lost all control over her" in a rabbit warren, probably from sudden awakening or reawakening of a long dormant or hitherto ungratified instinct. On the other hand, she manifested her despair at the sight of trunks, or other paraphernalia of travel, when she knew she was not to be one of the travelling party. Here we have a highly excitable, probably highly-bred dog, luxuriously brought up, equally liable to elation and depression, both in their normal and abnormal degrees or forms.

In *confinement*, Indian crows lose all their amusingness to man—"all their cunning and knavery . . . . The only faculty" (one of them) "exhibited was insatiable hunger, combined with *imbecility*. The other (free) crows seemed to despise him, although he flapped his wings imploringly to them; and they always helped themselves unresistingly to his food."†

Jesse tells us of black beetles, that "if they are touched by the *(human) breath,* it has such an effect on them that they lose all recollection of where they are and what they are about, and rush and flounder away in a kind of madness, forgetting in their haste and agony their proper retreats, and scrambling anywhere, in all directions, until they have managed to hide themselves;" and the same author assures us that "bees are exasperated by breathing on them."‡ If

* Of April, 1876, p. 52.

† Article on "The Indian Crow," in "Chambers's Journal," for July 22, 1876, p. 480.

‡ "Scenes and Tales of Country Life," edition of 1875 (Golden Library series), pp. 227 and 301.

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the *fact* be as stated, we have yet to seek for its explanation. At present we do not know whether it is by virtue of its carbonic acid, or heat, or moisture, or of what other quality, that man's breath so singularly affects certain insects. Nor, indeed, do we know the exact species or genus either of beetle or bee that were made the subject of the very simple experiment described by Jesse, and which can surely be repeated without a "licence" under the Vivisection Act. There are endless genera and species of "bees;" and it so happens, as if to illustrate the inexactitude even of naturalists, in the nomenclature of the animals whose mental qualities they describe and discuss in their "anecdotes," that the name "black beetle" is far from being distinctive. Though it might fitly be applied to a great number of our common Coleoptera, it would appear to be popularly used in reference to two very different animals—the better known of which is not a beetle at all, though an insect. These two insects are—

1. The common cockroach *(Blatta orientalis)*, belonging to the *Orthoptera;* and

2. A beetle, known also as the "Darkling Beetle," and the "Churchyard Beetle"—*Blaps mortisaga*—belonging to the *Coleoptera*, a frequent companion of the cockroach in British pantries and cellars.*

In 1875 an elephant, mad with *toothache*—or said to be so—was shot in India, as reported by Mr. R. W. Morgan, Deputy Conservator of Nilgherry forests. But the animal was also a "solitary," or "rogue" elephant, a "wouty" of the natives,† one that had been banished from its herd for some misdemeanour, under which circumstance the animal usually becomes morose, ferocious, and destructive. So that, in this particular case, there was probably more than the mere furiosity or mania of physical agony. In other cases in elephants, however, we know that toothache has sufficed to induce mania, just as the mere presence of intestinal worms, and the eccentric irritation they produce, do so in the dog‡.

Maudsley describes a *male* canary as "mad with rage," at the want of offspring, his fury leading to, or followed by, fighting to exhaustion.§ We know that barrenness or sterility frequently begets more or less profound mental dis-

* According to "Chambers's Encyclopœdia," articles "Blaps," "Black Beetle," and "Cockroach."

† "Daily Review," Sept. 21, 1875.

‡ *Vide* (1) paper on "Community of disease," p. 20; and (2) "Illustrations of Animal Reason," "Scottish Naturalist," 1875, p. 104.

§ "Genesis of Mind," 1st paper, p. 492.

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turbance in *female* animals. But in such a case as this canary, that it was mad, and from want of offspring, requires further proof or confirmation; a remark, however, that applies equally to many assertions made as to the fact and cause of madness in the lower animals.

The Ettrick Shepherd speaks of "the central lands of Africa, where lions go raving mad for water."* That they do become insane occasionally from *thirst* is possible, even probable. But I have met with no confirmation of the Shepherd's assertion in the narratives of any modern travellers. And, on the other hand, there are other cases in which, as regards, for instance, delusion or insanity in certain of the lower animals, the Shepherd, Christopher North, and De Quincey have obviously been drawing on their imagination, in whole or in part.

Thus delusions are ascribed to the young Newfoundland dog, "O'Bronte,"† under the influence of opium. De Quincey refers to its being "in the dream world," ‡ as he himself so frequently was as the result of his opium-eating. But, so far as the dog is concerned, there is here an obvious error founded on the false analogy of the occasional effects of opium or its derivatives on man. There is no evidence that opium, or its salts, even in large doses, affect dogs in the way in which they do man. In fact, there is ample evidence to the contrary. More than 20 years ago I had myself occasion to point out, as the result of experimental inquiry, that large doses of opium [in the forms of tincture, to the extent of three drachms at a time; or of dry muriate of morphia, to the extent of 20 grains] might be administered to dogs without appreciable effect. Sometimes vomiting was produced by morphia in solution, or there was mere quietude, with or without drowsiness. But there was no coma, and no contraction of pupil, in any of my experiments, whereas a single grain of strychnia produced immediate and fatal results§ in dogs. Nevertheless, the rhapsodical assertions of even poets and visionaries on such a subject deserve the notice of the comparative psychologist, and may lead him at least to expose and destroy popular errors by his investigation of the grounds on which poetical fancies have been based.

* "The Comedy of the Noctes Ambrosianæ," selected and arranged by John Skelton, Advocate. Edin., 1876, p. 343.

† "Comedy of the Noctes," p. 370.

‡ *Ibid*, p. 379.

§ *Vide* my paper on the "Non-susceptibility of the Lower Animals to the influence of certain Poisons," "Association Medical Journal" for first half-year of 1854 (June 9th).

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Speaking of certain Mexican ants, Capt. Kennedy, of H.M.S. "Reindeer," tells us, "It is said that *corrosive sublimate*, sprinkled across their path, will drive them mad, when they attack and destroy one another."* I have met with a similar statement elsewhere. It is a suggestive one, leading to the consideration of the operation of many of man's drugs indirectly on the animal mind. This department of *experimental pathology* I venture specially to commend to the notice of so ingenious and intelligent an experimentalist as Sir John Lubbock. He has told us what have been the results in his hands of subjecting ants to the influence of *chloroform* and *alcohol*, results that only bear out what has been seen in many higher as well as in certain lower animals. But I would suggest his extending his experiments by making use of corrosive sublimate, and other substances that are poisonous to man. We know a good deal as to the physical effects of such poisons on many animals, thanks to the research of modern physiologists and pathologists, especially of the German experimental school. But we have as yet much—almost everything—to learn of the *mental* effects of the same substances in the same animals.

"Science Gossip"† describes a lapwing as being "maddened by its nest being discovered," or by the mere supposition or apprehension that it had been discovered, by man or other enemies. This is but a common illustration of the frenzy of maternal anxiety or alarm—an emotion that is quite as poignant in many other animals as in woman.

"Chambers's Journal"‡ tells us of the *talking in sleep* of a pet starling that pronounced a dog's name, and so during sleep called the dog, while it never did so in the waking state. The parrot, too, prattles in its *dreams*, and there is sometimes in these dreams the same kind of *incoherence* or inconsecutiveness of *speech* and idea, apparent or real, as there is occasionally in senile dementia, or other forms of insanity, in the same animal. Such facts suggest the propriety of *experiment* on talking birds as a means of discovering the mental effects of medicinal and other substances. For in them we have the additional element of *language*, and of man's own language, to assist us in our conclusions.

It would be easy for me, from the notes accumulated during the last five years, to multiply such *illustrations of animal insanity*, to an extent that would probably be both wearisome

* In his "Sporting Adventures in the Pacific," 1876.
† Of November, 1875, p. 262.
‡ Of September 16, 1876, p. 595.

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and perplexing to my readers. It would not be proper and prudent, however, to do so without some classification of such illustrations, whether practical or scientific. And there are not a few groups of such practical importance to man, and so numerous and interesting in themselves, that a description of them would occupy in each case one or more average-sized "articles." Thus the category of "The forms of insanity usually confounded with rabies," is of sufficient importance and extent to occupy at least one goodly-sized essay; and the same may be said, for instance, of "The forms of mania producible or produced by man's ill-usage." Obviously, therefore, the illustration of animal insanity, its forms and causes, cannot be further proceeded with here or at present. But inasmuch as my present object is to introduce the subject of the pathology of mind in the lower animals to students of the pathology of mind in man, with a view to induce them to betake themselves to a new and extensive field of investigation, it seems to me proper here to append a *bibliography,* containing a list of the chief works I have had occasion to peruse in my own inquiries, and which works may prove equally useful to other inquirers.

Bibliography.

[Being a list of works containing descriptions of, or references to, the various forms of madness or insanity—imbecility or idiocy—in the lower animals.]

1. "Traité de la Folie des Animaux de ses Rapports avec celle de l'Homme." 2 vols. 8vo. Paris. 1839. By the late Dr. Pierquin, Physician to the Charité Hospital, Paris.

The work was founded on a memoir presented to the Paris Royal Academy of Medicine, where its title was received with boisterous merriment (vol. i, preface p. vi.), and to the Institute (in 1829). Portions of it were published in Majendie's "Journal de Physiologie" in 1830. It was also submitted to the "Société Française de Statistique Universelle," and the "Société Statistique du Marseille," where it was reported upon, as by the Academies of Paris. Abundant criticisms appeared also in various German philosophical, scientific, or medical journals, in or about 1830. The sections of the work, as published in 1839, had the advantage of critical revision by Georges and Frédéric Cuvier, Paris; Professor Majendie, Paris; Drs. Bottex

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(Physician to the Lunatic Hospital at Antiquailles), Guislain (Ghent), and Esquirol (Paris), the eminent psychologists; Drs. Schnell (Berne), Mathey (Geneva), Hazard, Segalas, and others. The book embodies, in foot-notes, the comments made by some of these distinguished writers, such as Majendie, Bottex, and Schnell. Like all truly scientific naturalists and physicians, Pierquin was characterised by cautiousness in the acceptance of facts and in generalisation from them. His important work, which is not at all known apparently in this country now-a-days, is entitled, nevertheless, to rank with the recent productions of Charles Darwin, Houzeau, Wallace, and Herbert Spencer. It was far in advance of its day. It is by no means confined, as its title would seem to imply, to the *insanity* of the lower animals, but contains also a large amount of detail relating to mental physiology. Thus, while he has chapters or sections on the probabilities of the occurrence of insanity in animals, ancient theories regarding animal insanity, the etiology of madness in animals; others treat of the history of the development of the science of comparative psychology, the influence of the maternal imagination, free-will, antipathies, the moral sentiments, the various expressions of intelligence, and the physical signs of the passions. His volumes contain also numerous anecdotes, from classical times downwards, illustrative of the intelligence and instinct of the lower animals.

2. Works by the late Delabere Blaine.

He was "first an army surgeon, and subsequently the greatest veterinarian of this or probably of any other nation," according to George R. Jesse, himself the author of the better known "Researches into the History of the British Dog."

(*a*) "Canine Pathology." 8vo. London. 1844.

(*b*) "Outlines of the Veterinary Art." 2nd edition. 1816.

3. Works on the Dog, Horse, and Sheep, by the late William Youatt, President of the Royal College of Veterinary Surgeons, London; Veterinary Surgeon to the Zoological Society of London and to the Royal Society for the Prevention of Cruelty to Animals; Lecturer on Veterinary Medicine at University College, London; and Editor of the "Veterinarian."

(*a*) "The Dog." 8vo. Illustrated. 1845. Published under the superintendence of the "Society for the

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Diffusion of Useful Knowledge," by Chas. Knight and Co., London.

An admirable text-book or student's manual.

(*b*) "The Horse." Edited by the late Professor Spooner, of the Royal Veterinary College, London. 8vo. Illustrated. London. 1857. Published as one of "The Farmer's Series," by the "Society for the Diffusion of Useful Knowledge."

(*c*) "The Sheep." 8vo. London. 1856.

4. "The Dog in Health and Disease." By J. H. Walsh, F.R.C.S., Editor of the "Field;" better known under his *nom de plume* of "Stonehenge." 8vo. Illustrated with woodcuts. 1st edition, London, 1859; last, 1872.
5. "The Veterinarian: a Monthly Journal of Veterinary Science." Edited by Professor Simonds, of the Royal College of Veterinary Surgeons, London, assisted by Professors Brown, Tuson, and Cobbold, all of the said College. 8vo. Now in its 49th or 50th volume.
6. "The Veterinary Journal and Annals of Comparative Pathology." Edited by George Fleming, author of "Rabies and Hydrophobia," and other well-known veterinary works.

Begun in July, 1875, and issued monthly. Similar in its scope and size to the "Veterinarian," but more scientific and of greater interest, therefore, to the comparative psychologist and pathologist.

7. "The Edinburgh Veterinary Review and Annals of Comparative Pathology." Edited by Professor John Gamgee, Principal of the New Veterinary College, Edinburgh, and thereafter of the Albert Veterinary College, London.

Published in Edinburgh in 6 vols. between 1858 and 1864.

8. "Fact against Fiction: the Habits and Treatment of Animals Practically," including observations on Hydrophobia and Distemper. By the Honble. Grantley F. Berkeley. 2 vols. 8vo. London. 1874.
9. "On the Hereditary Transmission of the Effects of certain Injuries to the Nervous System" in the lower animals. By Dr. C. E. Brown-Séquard, F.R.S., of Paris, London, and Boston, U.S. "Lancet," January 2, 1875, p. 7.
10. "Chambers's Encyclopædia: a Dictionary of Universal Knowledge for the People, illustrated with maps and

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numerous wood engravings." Edited by Andw. Findlater, M.A., LL.D. 10 vols. 8vo. 1860-8. Article on Rabies, Vol. viii.

11. "The Ox: its Diseases and their Treatment." By J. R. Dobson, Veterinary Surgeon. Illustrated. Crown 8vo. London. 1864.
12. "The Insect World." By Louis Figuier, of Paris. 3rd English edition. By Professor Martin Duncan. (Cassells, London, 1872).

Abounds in pictorial illustrations, of which four full-page ones are specially interesting, viz.—

(*a*) P. 451, that representing the horses of a diligence rendered furious by a cloud of cockchafers.
(*b*) P. 57, a herd of horses attacked by gadflies.
(*c*) P. 60, a herd of cattle attacked by bot-flies; and
(*d*) P. 66, sheep attacked by the breeze-fly.

13. Works by George Fleming, F.R.G.S., Veterinary Surgeon in H.M. Royal Engineers, Chatham, and Editor of the "Veterinary Journal and Annals of Comparative Pathology."
    (*a*) "Rabies and Hydrophobia." 8vo. London. 1872.
    (*b*) "Animal Plagues: their History, Nature, and Prevention." 8vo. London. 1871.
    (*c*) "Panics among Horses." "Veterinarian," October and November, 1871.
    (*d*) "Madness among Dogs." A lecture at Manchester in 1874, reported in the "Animal World" for November, 1874.
14. "Rabies and Hydrophobia." By the late Thos. Lindley Kemp, M.D., of Edinburgh. "Edinburgh Medical and Surgical Journal," January, 1855.

An admirable history of and commentary on both diseases —the canine and the human.

15. "Antiquarian Scraps relating to Insanity." By T. W. Macdowall, M.D., F.S.A. Scotland (of Morpeth). "Journal of Mental Science," Oct., 1873.
16. "Experimentation on Animals for the advance of Practical Medicine." By B. W. Richardson, M.D., F.R.S., in "Nature" for 1876.
17. Works by W. Gordon Stables, M.D., R.N., author of "Medical Life in the Navy."
    (*a*) "Cats: their Points and Characteristics, with Curiosities of Cat Life and a chapter on Feline Ailments." 8vo. London. 1874.

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18. "Sur quelques Recherches expérimentales sur la Rage." By Dr. Breschet, in "L'Expérience." Paris. October 8, 1840.
19. "The Cat: its History and Diseases." By the Honble. Mrs. Cust. 1870.
20. "The Darker Superstitions of Scotland." By the late Sir John Graham Dalyell.

Contains instances of insanity in the lower animals ascribed to *witchcraft* and *demoniacal possession.*

21. "Veterinary Medicines: their Actions and Uses." By Finlay Dun, formerly lecturer on Materia Medica and Dietetics, in the Edinburgh (or Dick) Veterinary College, and now of Weston Park, Shipstown, Stour. 4th edition. Edinburgh. 1874.

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23. "Sheep: their History, Structure, Economy, and Diseases." By the late Professor (W. C.) Spooner, of the Royal College of Veterinary Surgeons, London. Illustrated new edition. 1874.
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25. "Trials of Animal Magnetism on the Brute Creation." By J. Wilson. 8vo. 1839.
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