

Of the five cases mentioned by Dr. Kneeland, which occurred among the members of the 45th Mass. Reg., four proved fatal within thirty-six hours from the onset of the disease, and one on the fourth day.\* And of fourteen deaths, mentioned in the communication from Dr. Jewett, the greatest duration of the disease was twenty-three days, the least one day.†

The *age*, when it could be obtained, of the patients attacked, in the cases hereinbefore recorded, was found to vary from 17 to 31 years, in the proportion as follows, viz. :—

- In 1 case the age was 17 years.
- In 4 cases the age was 18 years.
- In 3 cases the age was 19 years.
- In 2 cases the age was 20 years.
- In 4 cases the age was 21 years.
- In 2 cases the age was 22 years.
- In 2 cases the age was 23 years.
- In 1 case the age was 27 years.
- In 1 case the age was 28 years.
- In 1 case the age was 31 years.
- In 1 case the age was 32 years.

Of Dr. Jewett's fourteen cases, the youngest was 16 years of age, the oldest 30 years; the average 20 years.

In regard to the *prognosis*, it was generally unfavorable. Of about forty cases received into the Stanly General Hospital—and which were regarded as genuine examples of the disease—twenty-eight proved fatal. Of the five cases mentioned by Dr. Kneeland, all died.‡ And of the fourteen communicated by Dr. Jewett, all were fatal. Dr. Cowgill has reported five well-authenticated cases of recovery, out of twelve treated in the Academy Hospital, under his charge—being the largest ratio of recoveries in proportion to the number of cases received.

[To be continued.]

## ON THE CLASSIFICATION OF MAMMALIA.

By PROFESSOR T. H. HUXLEY, F.R.S.

THE battle-ground of classification is now confined to the orders of Monodelphia. Some will not admit the order of Toxodontia; by others the Primates are divided into Quadrumana and Bimana; again, others unite Sirenia and Cetacea. But it is useless to enter upon this ground, and we must ascertain how these orders

\* See Dr. Kneeland's letter to the Surgeon-General of Massachusetts, in the *Boston Medical and Surgical Journal*, March 12th, 1863.

† A well authenticated case, under the care of Dr. Haddock, has just proved fatal on the 84th day! Unfortunately, no *post-mortem* investigation could be obtained.

‡ Three of these were treated in regimental and two in general hospital. See Dr. Kneeland's letter, before referred to.

may be arranged, by clear and definite characters, into larger divisions. The earliest attempts at this were made by Sir Everard Home, but his definitions were very rough and are not worth mentioning. He spoke of the characters of the placenta in different mammals. The next step was taken by Mr. Waterhouse, who was struck by the form of the brain in Mammalia, and divided the Monodelphia or Placentalia into two groups.

PLACENTAL MAMMALIA.	{	I. Those possessing a smooth brain. (Waterhouse.)	{	Cheiroptera.
		<i>Lissencephala</i> (Owen)	{	Insectivora. Rodentia. Edentata, or Bruta.
	{	II. Those having a convoluted brain. (Waterhouse.)	{	Quadrumana.
		<i>Gyrencephala</i> (Owen)	{	Carnivora. Cetacea. Proboscidea. Peristodactyla. Artiodactyla. Sirenia.
	{	<i>Archencephala</i> (Owen) ...Homo.		

Mr. Waterhouse does not, however, mention Man. After that, in 1844, Milne-Edwards proposed another classification, based on the characters of the placenta, having, however, nothing to do with Sir Everard Home's. He pointed out four, or rather three, different forms of placenta. In the first the villi are scattered over the chorion; the second form has these united in knobs (cotyledons). The first is a *diffuse* placenta; the second a *cotyledonary* one; but in reality they are the same form modified. In the third kind the villi form a ring round the ovum, constituting a *zonary* or *zonular* placenta; and lastly, in the fourth it is cake-like, and is termed a *discoidal* placenta. This exists in Man, Apes, Insectivora, Cheiroptera, and Rodentia. The Carnivora possess a zonular placenta. In the rest it is either diffuse or cotyledonary. (In Hyrax it simulates a zonular form.) In 1859, Professor Owen, in a paper read before the Linnæan Society, and printed in that Society's Proceedings for the year, returning to the cerebral characters, put forth another classification of Mammalia, calling Mr. Waterhouse's smooth-brained mammals *Lissencephala* (as shown in the preceding table); those with convoluted brains, *Gyrencephala*, and for Man he formed the subclass, *Archencephala*. Now here are three classifications; which of them is the most worthy of adoption? That is to say, which explains, in the clearest and most definite way, the anatomical characters of the groups which it contains? Prof. Huxley began with the last mentioned. First of all, do the differences said to exist between the brains of *Archencephala* and *Gyrencephala*, and of these and *Lissencephala*, really exist? We shall see; and it is better to give Professor Owen's own words to avoid mistakes. These are the characters he gives to his *Lissencephala*:—"The next well-marked

stage in the development of the brain is where the corpus callosum is present, but connects cerebral hemispheres as little advanced in bulk or outward character as in the preceding sub-class (Lyencephala containing Implacentalia), the cerebrum leaving both the olfactory lobes and cerebellum exposed, and being commonly smooth, or with few and simple convolutions in a very small proportion composed of the largest members of the group. The mammals so characterized constitute the sub-class Lissancephala."

Professor Huxley then exhibited the brains of an anteatr and a capybara (both Lissancephala); they were abundantly convoluted. He then showed the brain of a genett (*Viverra*), nearly quite smooth, as is also that of marmoset monkeys, these being placed among Professor Owen's Gyrencephala, which he thus characterizes:—

"The third leading modification of the mammalian cerebrum is such an increase in its relative size that it extends over more or less of the cerebellum, and generally more or less of the olfactory lobes. . . . The superficies is folded into more or less numerous gyri or convolutions, whence the name Gyrencephala, which I propose for the third sub-class of Mammalia."

It is a puzzling thing to appreciate the value of sub-classes placed in such a position. How can a Lissancephala have a convoluted brain and a Gyrencephala a smooth brain? These distinctions may do as far as general characters are concerned, but can never form the definition of a sub-class. And now for Professor Owen's last sub-class, which he defines in the following manner:—

"In Man the brain presents an ascensive step in development higher and more strongly marked than that by which the preceding sub-class was distinguished from the one below it. Not only do the cerebral hemispheres overlap the olfactory lobes and cerebellum, but they extend in advance of the one, and further back than the other. Their posterior development is so marked that anatomists have assigned to that part the character of a third lobe. It is *peculiar to the genus Homo, and equally peculiar is the posterior horn of the lateral ventricle and the 'hippocampus minor,'* which characterize the hind lobe of each hemisphere. . . . I am led to regard the genus *Homo* as not merely a representative of a distinct order, but of a distinct sub-class of the Mammalia, for which I propose the name Archencephala."

To all who understand plain language, said Prof. Huxley, the meaning of this paragraph is quite clear. When a man gives certain characters as peculiar to one group, he must mean that they are found in that and no other. The lecturer then proceeded to put before his audience facts in opposition to Professor Owen's statements. First, the backward extension of the posterior or third lobe further than the cerebellum is anything but *peculiar* to Man, as Professor Huxley showed by the cast of the interior of the skull of a gorilla (as everybody knows, the cast of the interior of the skull in all

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mammals gives a very good and exact idea of the form of the brain, as in them this organ fills up completely the cavity of the skull); and placing it so that the tentorial plane was horizontal, he showed how the cerebellum was completely covered by the posterior lobes, so that a plane object held perpendicularly to these cannot touch the cerebellum. It is quite easy to demonstrate this fact with the skull alone. Drawing a line from the lateral sinus to the margin of the pars petrosa—attachments of the tentorium—the overlap is then perfectly clear. And when one comes to the lower apes, baboons, and others, it is obvious on examination that the cerebellum is overlapped to a far greater extent than in Man; and, as T. Geof. St. Hilaire showed long ago, this attains a maximum degree of development in the *Chrysothrix*—small American monkeys. The same occurs with the posterior cornu, which in Man is sometimes very short, and with the “hippocampus minor”—both being extremely variable. Where the posterior lobe and its posterior cornu exist, the hippocampus minor is always present; it is a prominence on the floor of the posterior cornu, formed by a pushing in, as it were, of a particular sulcus on the inner and under surface of the posterior lobe parallel with the horn. Now, all these structures certainly exist in many apes. Mr. Marshall has shown them in the chimpanzee, Dr. Rolleston in the orang, in which these structures are very largely developed, and, as Prof. Huxley showed with specimens he had, larger comparatively than in some men. The same is the case with the gorilla, and by far the largest number of apes. The lecturer said that he could not understand how, when these characters, said to exist, do not, the two sub-classes, Gyrencephala and Archencephala, can be separated; and surely, even if these did exist, no sound zoölogist would make such variable characters the basis of a classification, these being the last structures in the world to base definition on. Thus the sub-classes Gyrencephala and Archencephala fall to the ground. The structures above referred to vary so much, that in two genera of apes—the South American *Myrcetes*, and, as Mr. Flower has recently shown, the Gibbons (*Hylobates*)—the cerebellum projects slightly; and in the last, one of the genera of the man-like apes, the cerebellum is so large that it projects not only posteriorly, but also laterally.

Let now more positive grounds occupy our time. Milne-Edwards laid great weight on the form of the placenta, but not on its structure—a much more important if not valid character, forming the basis of a classification which is at present the most certain. In all placental mammals examined, the formation of the placenta is preceded by a swelling and increased vascularity of the walls of the uterus, forming the “maternal placenta,” into whose depressions and sinuosities the villi of the foetal placenta dip and interlock; this takes place so firmly in some mammals that at birth the maternal comes away with the foetal placenta. These may thus be said to have

a *coherent placenta*; while all the rest, in which the foetal placenta alone comes away, have an *incoherent placenta*. As far as our present knowledge goes, this classification holds good for all, and moreover does not break natural affinities. Some say that it is unnatural because it groups together very dissimilar animals, such as men, apes, bats, rodents, hedgehogs, and shrews; but anybody who has studied the so-called *Quadrumana* is well aware that in them forms exist quite as low as any of these, and differing extremely in many characters one from another—from the gorilla, with a dentition, uterus, and many other organs similar to those of men, tailless and walking nearly erect, to the lemur, possessing a totally different dentition, walking on all fours, and provided with a long tail; and yet nobody has ever doubted that it is one of the *Quadrumana*, and certainly not the lowest, for in them we have such animals as the *tarsius*, the rodent-like *cheiromys*, and the bat-like *galeopithecus*, feeding on insects, and possessing an intelligence inferior to that of many mammals not belonging to that group. Another question remains. Are we justified in classifying men and monkeys together? The comparison of the human skeleton with that of a gorilla, an orang, a chimpanzee, or any of the higher apes, will answer the question, and show at a glance the great resemblance and similarity there is between them. Now the gorilla, for example, is admittedly placed in the same order as the lemur, the *cheiromys*, and the *galeopithecus*, which differ, as we have seen, far more from it than it does from man. Thus we cannot but place them in the same order, or else all our notions of affinities and resemblances fall to the ground. The following is a table giving the best classification of mammals we possess:—

M A M M A L I A .

IMPLACENTALIA.

*Ornithodelphia.*  
Monotremata.

*Didelphia.*  
Marsupialia.

PLACENTALIA.

*Monodelphia.*

*Placentæ Incoherent.*

Edentata.  
Sirenia.  
Toxodontia. (?)  
Proboscidea.  
Peristodactyla.  
Artiodactyla.  
Cetacea.

*Placentæ Coherent.*

*Pl. zonary.*      *Pl. discoid.*  
Carnivora.      Insectivora.  
Rodentia.  
Cheiroptera.  
Primates.

[*London Lancet.*

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PLEURO-PNEUMONIA has again appeared as a disease among cattle in some parts of Massachusetts. Twenty-four cows, valued at \$620, were lately slaughtered in Waltham on account of being affected with it.