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1874.

INTERMEDIATE MEETING, MARCH 18, 1872.

THE REV. J. B. OWEN, M.A., IN THE CHAIR.

The Minutes of the last meeting were read and confirmed, and the following Elections announced :—

LIFE MEMBER :—Lewis Biden, Esq., 9, Victoria Chambers, Westminster.

MEMBER :—Major-General C. J. Cooke, 49, Eastbourne Terrace.

ASSOCIATE :—A. Hall, Esq., Haxted House, Bromley, Kent.

The following paper, inserted here in accordance with a special resolution passed by the Council, was then read by the Author :—

*DARWINISM TESTED BY RECENT RESEARCHES
IN LANGUAGE.* By FREDERIC BATEMAN, Esq., M.D.,
Physician to the Norfolk and Norwich Hospital, &c. &c.

PERHAPS no works in modern times have been so largely read and so freely criticised, and have exercised so great an influence for good or for evil, as the “Origin of Species” and the “Descent of Man.” The subject of which they treat is one of such absorbing personal interest, as tending to gratify the ardent desire for knowledge of the “*where and the whither*” of the human race, that these books have been received and perused with avidity, not only by professed naturalists, theologians, and men of science, but by a far wider circle of general readers.

It has been said of Luther that he was the monk that shook the world. It may with equal propriety be said that Mr. Darwin is the naturalist, who, by a hypothesis so strangely at variance with our traditions, has shaken the foundations of the religious world.

As the avowed object of the Victoria Institute is to investigate apparent discrepancies between Christianity and Science, and to deal with some of the modern forms of supposed antagonism between Science and Scripture, and as in my opinion the Darwinian hypothesis of the origin of man is directly opposed to the teaching of revealed religion, it seems to me that this is a

proper arena for discussing the value of this most strange and startling theory.

I need not, I am sure, in an audience like the present, define the peculiar scientific views which we understand by the term Darwinism. In his work on the "Origin of Species by Natural Selection," Mr. Darwin promulgated the theory, which had been previously put forth by Lamarck, that all species, instead of having been independently created, and possessing an independent existence, had been gradually developed out of other forms. In this work he merely hinted at the application of his hypothesis to man, but in his recently published work he does not hesitate to assert that man, the wonder and glory of the universe, has descended from the stem of old world monkeys, that he must be classed with the quadrumana, the most immediate ancestor from which this descent can be traced, being an anthropomorphous Ape!

This theory abolishes the idea of creation, in the ordinary sense of the term. It, at most, concedes to Nature the faculty of causing one species to spring from another, and it consequently excludes all direct, personal, and miraculous intervention of a creating power.

Here I wish to observe, that, although a decided and most uncompromising opponent of Darwinism, I have no *à priori* objection to raise against the theory, and I trust I shall say nothing to-night to justify my being classed amongst those whom Mr. Darwin describes as "curiously illustrating the blindness of preconceived opinion," or amongst those whom Professor Huxley describes as "contenting themselves with smothering the investigating spirit under the feather-bed of respected and respectable tradition." Deprecating all idea of stirring up the *odium theologicum*, I consider the doctrine of evolution as a legitimate subject for scientific inquiry. I acknowledge, moreover, the fairness and perfect honesty with which its author has handled the subject, and I recognize also the deep knowledge of natural history which the "Descent of Man" displays; and from its charm of style and elegance of diction, I am not surprised that it has become equally popular in the drawing-room of the votary of fashion, as in the study of the naturalist and the theologian.

I should not reject the Darwinian view of the origin of man, from any fancied notion that its adoption was derogatory to our dignity and inconsistent with man's position in the order of Nature, a notion which was evidently held by the poor deluded creature whose suicide was lately recorded in the public papers, and upon whose person was found a document, stating that his existence was no longer to be tolerated, since Mr. Darwin's

discovery that he was descended from a monkey. Instead of sympathizing with the views of this unhappy victim of prejudice and folly, I fully echo the sentiment of the naturalist who said that he would prefer being descended from a good honest monkey, to being obliged to avow himself the offspring of certain fanatical enemies of scientific knowledge and progress.

Besides, I can console myself with the thought that whatever may have been the remote origin of man, for ages he possesses a history of his own; he has filled the world with monuments of his ambition and of his genius; he is the sole actor in a drama where other animal beings play only an accessory part. The embalmed records of three thousand years, the figures of animals and birds engraved upon the ancient Egyptian monuments, show that there has been no *beginning* of a transition of species during the long period of thirty centuries. Throw in, if you will, a few hundreds of millions of years, and snatch from us our titles of nobility, and claim the possibility of our descent from an anthropoid ape, and I even then maintain that man's dignity is not *necessarily* lowered, his position in the scale of creation is not altered; I should still cheer myself with the eloquent language of Sedgwick: "Man stands by himself, the despotic lord of the living world; not so great in organic strength as many of the despots that went before him on Nature's chronicle, but raised far above them all by a higher development of brain; by a frame-work that fits him for the operations of mechanical skill; by superadded reason; by a special instinct for combination; by a prescience that tells him to act prospectively; by a conscience that makes him amenable to law; by conceptions that transcend the narrow limits of reason; by hopes that have no full fruition here; by inborn capacity of rising from individual facts to the apprehension of general laws; by a conception of a cause for all the phenomena of sense; and by a consequent belief in a God of Nature."

I see nothing in the doctrine of evolution, as applied to the origin of man, that is inconsistent with *Natural* Religion. We know that in intra-uterine life we pass through a preparatory stage which we can but imperfectly realize and understand, and therefore we can readily admit that the Creator, if He had chosen, could have endowed us with a previous existence in the form of a less perfect animal than man; I say, the Darwinian hypothesis of the origin of man is not inconsistent with *Natural* Religion, but it is directly opposed to *Revealed* Religion, which tells us that "God formed man of the dust of the ground, and breathed into his nostrils the breath of life, and man became a living soul." I regard, with Archdeacon Pratt, "the six days of the creation as exhibiting a series of creative acts, which terminated in the

appearance of the human race upon the scene; the animals and plants then created were the progenitors of those which now, possibly with others since created, tenant the earth."

The novelty of Mr. Darwin's views has had something to do with the ready reception of them by the rising generation, who in this age of electric telegraphy and underground railroads, are always seeking the sensational and the marvellous, the tendency of whose mind is to consider those who differ from them as standing upon a lower intellectual platform than themselves.

My intention is not to attempt to enter into a general criticism of the value of the arguments for or against the Darwinian theory; this would lead me far beyond the limits within which I propose to confine this paper; moreover, this has been done over and over again by far abler hands than mine. Nor do I intend to trespass upon your time, beyond a mere allusion to the controversy which has for some years been going on in respect to the structural differences between man and animals; and I shall consider it equally foreign to my purpose to inquire into man's zoological position, considering it, as I do, of comparatively little importance whether he be considered as belonging to a species, order, class, or sub-class of the animal kingdom. I propose to test Darwinism solely and simply in reference to its bearings upon the faculty of Articulate Language.

Those who have read the "Descent of Man," will remember that the author begins by saying that he who wishes to decide whether man is the modified descendant of some pre-existing form, would probably first inquire whether man varies, however slightly, in bodily structure, and in mental faculties; and if so, whether the variations are transmitted to his offspring in accordance with the laws which prevail with the lower animals. He then proceeds to compare the bodily structure of man and that of the lower animals, remarking that all the bones in his skeleton can be compared with the corresponding bones in the monkey, bat, or seal; that it is the same with his muscles, nerves, blood-vessels, and viscera,—in fact, he shows that there is a remarkable correspondence between man and the higher mammals, especially the ape, in the structure of the brain and other parts of the body. He then calls attention to the fact that man is liable to receive from the lower animals, and to communicate to them, certain diseases, as hydrophobia, small-pox, the glanders, &c., a fact which he says proves the close similarity of their tissues and blood, both in minute structure and composition, far more plainly than does their comparison under the best microscope, or by the aid of the best chemical analysis.

He then goes on to point out that man and other animals are liable to be infected with parasites of the same genera or families; that there is the greatest similarity in the law of periodicity regulating several of their functions; and that the same remarkable resemblance occurs in their embryonic development, observing that the human embryo, at a very early period, can hardly be distinguished from that of other members of the vertebrate kingdom.

Having cited various authorities to prove the truth of the above statements, he observes that "the homological construction of the whole frame in the members of the same class is intelligible, if we admit their descent from a common progenitor, and that it is only our natural prejudice, and that arrogance which made our forefathers declare that they were descended from demigods, which leads us to demur to this conclusion;" and he finishes this, his introductory chapter, by saying that time will before long come, when it will be thought wonderful that naturalists, who were well acquainted with the comparative structure of man and other mammals, should have believed that each was the work of a separate act of creation. Having shown that there is no essential difference between man and the higher mammals in their corporeal organization, he then passes on to the consideration of the mental qualities, where, of course, a much wider gulf would be expected to exist; and even here, he points out that the germs of all our intellectual characteristics, and some of our moral, are to be found among the lower animals.

He argues that man and the higher animals, especially the primates, have the same senses, intuitions, and sensations; similar passions, affections, and emotions; that they feel wonder and curiosity; that they possess the same faculties of imitation, attention, memory, love, imagination, and even reason, though in different degrees. Having admitted that this difference is enormous, even if we compare the mind of one of the lowest savages, who has no words to express any number higher than four, and who uses no abstract terms for the commonest objects or affections, with that of the most highly organized ape, he insists, nevertheless, that the difference in mind between man and the higher animals, great as it is, is certainly one of *degree and not of kind*.

Having been engaged for some years past in studying the question of the localization of the Faculty of Speech, and believing that my published researches furnish a powerful and original argument against the doctrine of evolution, I trust I may, without presumption, be allowed to indulge the hope that I can furnish an additional and original argument against this dan-

gerous heresy, by showing that the possession of Articulate Language establishes a difference between man and animals, a difference not of degree only, but of kind.

I wish here to make a brief comment upon a most able notice of the "Descent of Man," which appeared in the *British Quarterly Review* for October, 1871. Agreeing as I do with the general tenor of the writer's remarks, I most entirely differ from him in one essential point. After disputing the truth of Mr. Darwin's assumed similarity between the minute structure of man and animals, he goes on to say, "If it could be shown that in their minute anatomy the tissues of an ape so closely resembled those of a dog on the one hand, and of a man on the other, as that they could not be distinguished by the microscope, the fact would be of the highest importance, and would add enormously to the evidence already adduced by Mr. Darwin." I cannot agree with the inference here drawn by the able reviewer, who seems to imply that Mr. Darwin's theory is unassailable if he can prove his assertion as to the close similarity in the minute structure of man and animals. I am ready to admit this similarity; I will even strengthen Mr. Darwin's position by remarking that we are unable by means of the microscope to distinguish human blood from that of other mammals; and further, that there is a remarkable correspondence in the vital properties of the blood of man and animals, as shown by the fact that in the case of apparent death in man from loss of blood, resuscitation has taken place in consequence of the transfusion into the system of the blood of an animal, as the sheep, or the calf. It is idle to attempt to shirk the import of these physiological results. I admit the force of them. But supposing it is proved to a mathematical demonstration that man is like an ape, bone for bone, muscle for muscle, nerve for nerve, what then? What does this prove, if it can be shown that man possesses a *distinctive attribute*, of which not a trace can be found in the ape, an attribute of such a nature as to create an immeasurable gulf between the two? This attribute I assert to be the faculty of Articulate Language, which I maintain to be a difference, *not only of degree, but of kind*.

I now propose very briefly to explain what I understand by the term faculty of language. I shall then inquire how far this faculty is shared by animals, and having shown that they do not possess it even in an elementary form, I shall then glance at the much-disputed question of the seat of language—the localization of the faculty of speech,—as I need not say, if it could be shown that language had a habitat in any particular part of the brain, the Darwinian could plead the structural analogy

between the brain of man and that of the ape, as a proof that the latter possessed the rudiments of speech in an undeveloped form.

Of all the branches of knowledge, there are none more interesting than the study of language. Man shares with animals the power of emitting sounds by means of an apparatus especially adapted for that purpose; sound being described as a particular movement of ponderable matter capable of affecting the organ of hearing. Man alone, however, possesses the power of regulating and systematizing these sounds, so as to transmit to others the impressions of his mind in the form of a language, which has been described as a sensible phenomenon by which thought becomes materialized. In fact, speech or language consists of a series of conventional sounds, which represent a meaning which the mind has previously attached to their expression. There are two distinct features in speech,—an act of the intelligence, and a sonorous mechanism. These have been termed *cognitive* and *executive*,—thought-speech and spoken-speech; the internal and external speech of M. Bouillaud. Here I would remark that it is important not to confound the faculty of *articulate* language with the *general* faculty of language, and Professor Broca's remarks on this subject are so lucid and terse that I cannot do better than transcribe them:—"There are several kinds of language; every system of signs which permits the expression of ideas in a manner more or less intelligible, more or less complete, or more or less rapid, is a language in the general sense of the word: thus speech, mimicry, dactylogy, writing both hieroglyphic and phonetic, are so many kinds of language. There is a general faculty of language which presides over all these modes of expression of thought, and which may be defined, the faculty of establishing a constant relation between an idea and a sign, be this sign a sound, a gesture, a figure, or a drawing of any kind."

Here we must inquire whether language is the exclusive prerogative of man? Some would answer this question in the negative, and M. Lemoine, in a highly philosophical treatise, entitled "*La Physiognomie et la Parole*," devotes a chapter to *Le Langage des Bêtes*, and a celebrated French anthropologist, M. Coudereau, maintains that man is not alone in possessing a language; that all species of animals possess one, varied, but sufficient to express their ideas. He further says that "man acquires the faculty of speech by his memory, labour, and imitation,—the parrot does no more. From a linguistic standpoint, this faculty is in its nature identical in man and animals;

man can articulate sounds, other animals can imitate sounds as well as he can. He presents simply, in this respect, a greater development of a faculty common to all social animals."

Mr. Darwin, whilst admitting that language has justly been considered as one of the chief distinctions between man and the lower animals, quoting Archbishop Whately, says: "Man is not the only animal that can make use of language to express what is passing in his mind, and that can understand more or less what is expressed by another." Mr. Darwin says man uses, in common with the lower animals, inarticulate cries to express his meaning, aided by gestures and the movement of the muscles of the face, and he doubts not "that language owes its origin to the imitation and modification, aided by signs and gestures, of various natural sounds, the voices of other animals, and man's instinctive cries." He suggests the probability that "primæval man, or rather some early progenitor of man, used his voice largely, as does one of the gibbon apes at the present day, in producing true musical cadences—that is, singing;" and it does not appear to him altogether incredible, that "some unusually wise ape-like animal should have thought of imitating the growl of a beast of prey, so as to indicate to his fellow-monkeys the nature of the expected danger; and this would have been a first step in the formation of a language"! A writer in the *Edinburgh Review*, commenting upon the above passage, asks for the evidence that at the present day some unusually wise ape has ever been known to imitate the cry of a wild beast, so as to indicate its presence to its fellows. Further, Mr. Darwin says that the sounds uttered by birds offer in several respects the nearest analogy to language, and he lays great stress upon the fact that parrots can talk. Now, I maintain that the so-called talking of the parrot is not articulate language, it is merely the result of a remarkable power of imitation possessed by that bird, which faculty of imitation can exist in the human subject after the power of language has ceased. The following case observed by myself will illustrate my meaning:—During a recent visit to La Salpêtrière, an institution in Paris for the reception of female patients for the most part afflicted with some mental disorder, the physician, Dr. Auguste Voisin, knowing I was interested in the question of language, called my attention to the case of an old woman in whom the faculty of speech was completely suspended, but who, although she never spoke, repeated like a parrot all that was said before her. For instance, Dr. Voisin addressed her thus:—"Voulez-vous manger aujourd'hui?" She said instantly, "Voulez-vous manger aujourd'hui?" I then said to her, "Quel âge avez-vous?"

She replied, "Quel âge avez-vous?" I then said to her in English, "You are a bad woman." She instantly replied, "You are a bad woman." I said, "Sprechen sie Deutsch?" She retorted, "Sprechen sie Deutsch?" In the words that she thus echoed, her articulation was distinct, although the foreign phrases were not repeated by her in quite so intelligible a manner as the French. Not only did this woman echo all that was said, but she imitated every gesture of those around her. One of the pupils made a grimace; she instantly distorted her facial lineaments in precisely the same manner. Another pupil made the peculiar defiant action, common in schoolboys, of putting the thumb to the nose and extending all the fingers, called in French, *pied de nez*. The patient instantly imitated this elegant performance. Just as we were leaving her bedside, a patient in an adjoining bed coughed; the cough was instantly imitated by this human parrot! In fact, this singular old woman repeated everything that was said to her, whether in an interrogative form or not; and she imitated every act that was done before her, and that with the most extraordinary exactitude and precision.

I have mentioned this case to show that the faculty of imitation seems to be independent of that of speech. The parrot may be taught automatically to do, in an imperfect degree, what this old woman did, but that does not imply the possession of language.

I would ask of those gentlemen who attach so much importance to pantomimic expression, and to the power of imitation possessed by certain animals, why it is that, under the influence of domestication, no monkey or parrot has ever evolved for itself an articulate language? The parrot and the monkey probably possessed the same power of imitation 3,000 years ago, and yet we see no probability of its gradual development into a more decided form of expression. I believe with Max Müller, that "speech is the one great barrier between the brute and man, and that no process of natural selection will ever distil significant words out of the notes of birds or the cries of beasts. Language is our Rubicon, and no brute will dare to pass it."

THE SEAT OF SPEECH.

Having defined what is meant by the faculty of language, I now proceed to review very briefly the various theories which have been from time to time promulgated as to the seat of Articulate Language; but before doing this, it is imperative that I should trouble you with a few anatomical details, for the better understanding of my subject, as I am justified in

assuming that a portion at least of my audience may be but imperfectly acquainted with the main divisions of the brain.

The encephalon is a collective term, which signifies those parts of the nervous system which are contained in the cranium ; viz., the cerebrum, or brain proper, the cerebellum, and the medulla oblongata. The cerebrum is by far the largest portion of the encephalon, and consists of two lateral halves called *hemispheres*, each hemisphere being subdivided into three *lobes*,—anterior, middle, and posterior. The hemispheres present upon their surface numerous smooth and tortuous eminences called convolutions, which have received special names, those only which concern my subject being the frontal convolutions, which are known as first, second, and third frontal. Of the cerebellum I need say nothing,—it has no reference to the subject of my remarks. The medulla oblongata is that part of the encephalon which is placed immediately above the spinal cord, forming the bond of union between it and the brain. It is divided into two lateral columns, which are themselves subdivided into three smaller cords, called the pyramidal, olivary, and restiform bodies.

The ancients seem to have possessed the most crude notions of the functions of the brain, as evidenced by Hippocrates' assigning the seat of the mind to the left ventricle, and by Aristotle also placing the sensorium commune in the heart. In later times the brain has been universally considered to be the organ of thought and intelligence ; but opinions have been, and are still, divided as to whether it is to be regarded as a single organ, or as consisting of a series of distinct organs, each endowed with a special and independent function ; whether, in fact, the phenomena of intelligence are due to an action of the brain as a whole, or whether the different psychological elements which constitute them are connected with isolated and circumscribed parts of the encephalon. Out of this last theory has arisen the principle of the localization of the cerebral faculties, which was, in the early part of the 19th century, announced in a definite form by Gall, who divided the brain into organs endowed with primordial faculties, distinct the one from the other. Gall was the first to attempt to connect the seat of language with any definite portion of the cerebro-spinal centre, by asserting that there was a special organ for language, which, according to him, was placed in those convolutions of the anterior lobes of the brain, which rest upon the posterior part of the supra-orbital plates, or, in other words, upon the roof of the orbit.

This is not the time or place to make more than a passing

allusion to Gall's views, as they have not met with anything like general acceptance; but although his conclusions must be considered in many instances arbitrary and hypothetical, still I would say, "Let not the spark be lost in the flame it has served to kindle," for, in spite of all that has been said against Gall and all that has been written in depreciation of his labours, beyond all doubt his researches gave an impulse to the cerebral localization of our faculties, the effect of which is especially visible in our own days; and I look upon his work as an imperishable monument to the genius and industry of one of the greatest philosophers of the present age.

Gall's labours would undoubtedly have met with a more hearty recognition from his contemporaries, had not the Austrian priesthood raised the cry of "*materialism*" as applied to his doctrines. The great German psychologist had no such heterodox notions as his adversaries maliciously attributed to him, for, as Hufeland philosophically observes, "he was employed in analyzing the dust of the earth of which man is formed, not the breath of life which was breathed into his nostrils."

As in Gall's days so in ours, this very indefinite and unmeaning word "*materialism*" is used as a kind of psychological scarecrow, to frighten all those who are endeavouring to trace the connection between matter and mind. Surely there is nothing contrary to sound theology in assigning certain attributes or functions of an intellectual order to certain parts of our nervous centre; the cerebral localization of our divers faculties, and the plurality of our cerebral organs, strike no blow at the great principle of the moral unity of man. The same power that caused the earth, "like a spark from the incandescent mass of unformed matter, hammered from the anvil of Omnipotence, to be smitten off into space," this same power, surely, could just as well ordain that a multiplicity of organs should be necessary to the full development of man's mental faculties, as that the manifestation of them should depend upon the integrity of one single organ.

Although not the next theory in chronological order, it is convenient here to make a passing allusion to the views of a Dutch physiologist, Professor Schröder Van Der Kolk, who placed the seat of speech in the olivary bodies. Besides citing numerous cases in illustration of his hypothesis, he gives an *à priori* reason for his theory in the fact, that the olivary bodies occur only in mammalia; that, on comparing these organs as occurring in mammals themselves, they are most developed in man, and that in the higher mammalia, as the ape, they are most like those in man. This hypothesis, which has never met with

much support, has been rejected by most physiologists of the present day.*

I now arrive at the consideration of certain theories which will demand a much more minute examination, as having a more direct reference to the objects of this Institute,—I mean those which locate speech in the anterior lobes of the brain, or in some particular fold of these lobes.

As far back as 1825, Professor Bouillaud placed the faculty of articulation in the anterior lobes of the brain, which he considered to be the organs of the formation of words and of memory; and he stated that the exercise of thought demanded the integrity of these lobes. He supported his position by reference to 114 cases in which loss or impairment of speech coincided with disease of the anterior lobes. Such was M. Bouillaud's confidence in his theory, that he offered a prize of 500 francs for any well-authenticated case in which the two anterior lobes were destroyed, or more or less seriously injured, without speech being affected. This challenge remained unaccepted for many years, till the occurrence of a celebrated discussion on the seat of language, at the Academy of Medicine of Paris, when M. Velpeau said he should claim the prize on the faith of the following case observed by himself.

In the month of March, 1843, a barber, sixty years of age, came under M. Velpeau's care for disease of the prostate gland. With the exception of his prostatic disorder, he seemed to be in excellent health, was very lively, cheerful, full of repartee, and evidently in possession of all his faculties; one remarkable symptom in his case being his *intolerable loquacity*. A *greater chatterer never existed*, and on more than one occasion complaints were made by the other patients of this talkative neighbour, who allowed them rest neither night nor day. A few days after admission this man died suddenly, and a careful autopsy was made. On opening the cranium, a cancerous tumour was found, which had taken the place of the two anterior lobes! Here then was a man, who, up to the time of his death, presented no symptom whatever of cerebral disease, who, far from having any lesion of the faculty of speech, was *unusually loquacious*, and who, for a long period prior to his decease, must have had a most grave disease of the brain, which had destroyed a great part of the anterior lobes.

Surely this case alone, recorded by such a high authority as M. Velpeau, ought to be sufficient utterly to subvert the theory

* The comparative value of this and the various other theories as to the Seat of Speech, are fully discussed in the author's work "On Aphasia, or Loss of Speech, and the Localization of the Faculty of Articulate Language." Churchill & Sons, 1870.

of the localization of speech in the anterior lobes; but I have still further evidence to adduce. M. Peter has recorded the case of a man who fractured his skull by a fall from a horse. After recovery from the initial stupor there succeeded a *remarkable loquacity*, although after death it was found that the two frontal lobes of the brain were reduced to a pulp (*réduits en bouillie*). Again, Professor Trousseau relates that in the year 1825, two officers quartered at Tours quarrelled, and satisfied their honour by a duel, as a result of which, one of them received a ball which entered at one temple and made its exit at the other. The patient survived six months without any sign of lesion of articulation, nor was there the least hesitation in the expression of his thoughts till the supervention of inflammation of the central substance, which occurred shortly before his death, when it was ascertained that the ball had traversed the two anterior lobes at their centre.

Here are three cases in which the two anterior lobes, the presumed seat of speech, according to Bouillaud, were both destroyed or very extensively injured. What does a conscientious analysis of them teach us? In M. Peter's case we have seen that speech was preserved, although both frontal lobes were reduced to a jelly; in Professor Trousseau's case, a ball had traversed the two anterior lobes at their centre, entering at one temple, and making its exit at the other, and speech was also unaffected; whilst in the third case, that of M. Velpeau, although a tumour had actually taken the place of the two anterior lobes, instead of being speechless, the man was remarkably loquacious.

These three cases, to which I could add others, seem to me to upset M. Bouillaud's theory, by showing that a profound lesion may exist in both anterior lobes without impairment of articulate language.

The next theory for brief consideration is that of M. Dax, who placed the seat of speech in the left hemisphere, to the exclusion of the right. The brain, as a whole, has hitherto been considered as a symmetrical organ, even by those who regarded it as an assemblage of lesser organs arranged in pairs with corresponding functions. M. Dax, however, assigns a function to the left hemisphere, which, according to him, is not shared by the right. Without entering into any details, I will just mention three cases, which prove the untenability of M. Dax's views, these cases being recorded by French physicians of great eminence. It will be observed that I have drawn most largely upon French literature, for our Gallic neighbours have been most indefatigable workers in the field of observation with

which we are just now interested. M. Maximin Legrand has related the history of a man who was shot in the head during the revolution of 1848, and whose speech was not in the least affected, although after death it was ascertained that the left anterior lobe had been shattered by the discharge of a gun. M. Béclard has published a case of a patient whose speech remained unaffected to the last, although it was found that all the left hemisphere was reduced to a pulp. Lastly, M. Lelut, one of the most uncompromising opponents of cerebral localization, has recorded the case of an epileptic, who retained his speech in its integrity to the last moment, although his entire left hemisphere was completely disorganized.

There is also another class of observations which seems to me to be irreconcilable with M. Dax's unilateral theory, for there exists a certain number of carefully recorded cases in which loss of language occurred, although the disease was limited to the right hemisphere. It will strike you, perhaps, that it is somewhat supererogatory to adduce evidence to show that language is not located in the *left* anterior lobe, for it must be apparent that the instances previously mentioned of destruction of *both* anterior lobes, with preservation of the power of speech, apply equally to the unilateral theory I am now discussing. My sketch, however, of the various theories about the seat of language would be incomplete without a reference to that of M. Dax.

Having disposed of the theories which locate the faculty of language in one or both anterior lobes, I arrived at the consideration of the views of Professor Broca, the perpetual secretary of the Anthropological Society of Paris, whose researches lead him to confine the seat of speech to a very narrow limit, a particular fold of the left anterior lobe, called the *third left frontal convolution*. Of all the theories that have been advanced, this least of all will stand the test of an impartial scrutiny, and evidence is daily accumulating of such a nature as to undermine M. Broca's position at every point. In my published work I have discussed the value of this theory at considerable length; I will simply state here that I have myself met with cases of loss or impairment of language in which this particular fold was found quite healthy; furthermore, one case has been observed by M. Moreau, of Tours, in which this convolution was *congenitally absent*, and yet the patient showed no symptom of loss of language. Now, I need not dwell further on this hypothesis, for it must be apparent to everybody that the cases I have quoted of destruction of the anterior lobes apply equally, or I may say *à fortiori*, to this theory; for, what proves the greater proves the less; and it is not conceivable that M. Broca's pet fold can have escaped

injury amid the general destruction caused by the lesions described. I cannot dismiss this hypothesis without calling attention to the confirmation that would be given to Mr. Darwin's views if M. Broca's theory were correct, and this particular fold could be shown to be the seat of speech in man. And here I must call attention to the comparison which Carl Vogt makes between our quadrumanous cousins and ourselves. According to this distinguished naturalist, the apes have an extremely imperfect development of the third frontal convolution, and the same condition exists in the microcephali; therefore, he says, as neither apes nor microcephali can speak, Comparative Anatomy gives a subsidiary support to the theory which places speech in this convolution.

I have been in communication with Professor Vogt in reference to this subject, and he has kindly favoured me with his views, which I consider so extremely pertinent to our subject, that I shall give them in his own words, as contained in an autograph letter to myself.

The brain of man and that of apes, especially of the anthropoid apes (orang, chimpanzee, gorilla), are constructed absolutely upon the same type—a type by itself, and which is characterized, amongst other things, by the fissure of Sylvius, and by the manner in which the island of Reil is formed and covered; thus in man, the third frontal convolution is extraordinarily developed, and covers partly the insula, whilst the transverse central convolutions are of much less importance. In the ape, on the other hand, the third frontal convolution is but slightly developed, whilst the central transverse convolutions are very large.

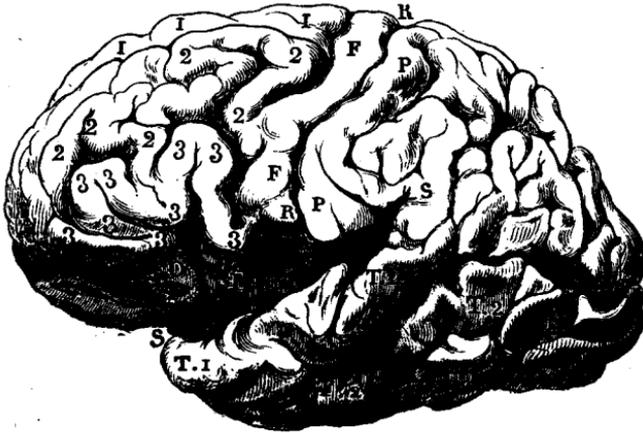
To show the bearing all this has upon the seat of speech, I would refer to the microcephali, who do not speak; they learn to repeat certain words like parrots, but they have no articulate language. Now, the microcephali have the same conformation of the third frontal convolution as apes; they are apes as far as the anterior portion of their brain is concerned. Thus, man speaks; apes and microcephali do not speak. Certain observations have been recorded which seem to place language in the part which is developed in man, and contracted in the microcephali and the ape; Comparative Anatomy, therefore, comes in aid of M. Broca's doctrine.

I have reason to believe that these views of Professor Vogt are not very generally known in this country; and I need hardly allude to the extremely important bearing they have upon the question at issue; for if Professor Broca's theory could be proved to be correct,—that this third frontal convolution is the seat of human speech,—a strong argument could be adduced in favour of Darwinism. It might be said the ape possessed the rudiments of speech in an undeveloped form, and that in subse-

quent generations, by the process of evolution, this fold would become more developed, and the ape would speak; in fact, would become a man! As, however, this fold has *not* been proved to be the seat of speech in man, the Darwinian argument from analogy of structure falls to the ground, and speech remains a barrier the brute is not destined to pass.

ENGRAVING OF THE CONVEX SURFACE OF THE LEFT HEMISPHERE.

Showing the Disposition and Arrangement of the Cerebral Convulsions.



The above engraving is the same as that used to illustrate the author's work on Aphasia. It is from a cast kindly sent to Dr. Bateman by his friend, Professor Broca, of Paris.

The anterior lobe is that portion of the hemisphere which is bounded behind by R R, the fissure of Rolando, and below by S S, the fissure of Sylvius.

F F, transverse frontal convolution.

P P, transverse parietal convolution.

O O, the orbital convulsions, where Gall placed the organ of language.

1, 2, 3, first, second, and third frontal convulsions. The third frontal is the convolution alluded to by Carl Vogt as being very slightly developed in the ape and in the microcephali, and it is in the posterior part of this fold that Professor Broca has located the faculty of speech.

T. 1, T. 2.—First and second temporo-sphenoidal convulsions.

I, Island of Reil (the superior and inferior marginal convulsions are represented as being drawn asunder so as to expose it).

The object of my paper to-night has been to test Darwinism by recent researches in reference to the faculty of *Articulate Language*.

My first point has been to show, and I must leave it to you to judge how far I have succeeded in showing, that animals do not possess a trace of *articulate* language, and therefore that this faculty establishes a difference not of *degree* but of *kind* between them and man, and I need not remind you how much stress Mr. Darwin lays upon the difference of *kind* in contradistinction to that of *degree*.

I have then thought it imperative to enter fully into the much-vexed question of the Localization of Speech; for as the remarkable similarity between the brain of man and that of the ape cannot be disputed, if the seat of human speech could be positively traced to any particular part of the brain, the Darwinian could say that although the ape could not speak, he possessed the *germ* of that faculty, and that in subsequent generations, by the process of evolution, the "*speech centre*" would become more developed, and the ape would then speak.

I have endeavoured, however imperfectly, to show that none of the various theories as to the seat of language will stand the test of an impartial scrutiny. I have shown, and that upon the most indisputable authority, that persons could talk when the *presumed* seat of speech was invaded by an enormous tumour, completely disorganized by disease, or destroyed by a pistol-shot!

With these facts before me, I am tempted to ask whether speech, like the soul, may not be an attribute, the comprehension of which is beyond the limits of our finite minds?

When we talk about the faculty of speech, have we any clear and definite notions as to what we mean? Does the loss of it necessarily imply organic lesion of structure—*material damage*?* If it were so, how can we account for the cases recorded in which restoration of the power of speech was due to the effect of a severe mental shock?

We are all familiar with the story in Herodotus of the son of Cræsus, who had never been known to speak, but who, at the siege of Sardis, being overcome with astonishment and terror at seeing the king, his father, in danger of being killed by a Persian soldier, exclaimed aloud, "Ἀνθρώπε, μὴ κτείνε Κροῖσον"—Oh man! do not kill Cræsus. This was the first time he had ever articulated, but he retained the faculty of speech from this event as long as he lived. Herodotus is universally admitted to be a trustworthy historian; but if it be thought far-

* For a more complete answer to this question, the author refers to his published work "On Aphasia," page 173.

fetched to illustrate a subject by allusion to a work written 500 years before the Christian era, I may add that such cases have been met with by modern observers. My friend Mr. Dunn has recorded a similar one, and I myself was recently requested to see a man who had suddenly become speechless. The suspension of the power of speech was unaccompanied by any symptom of paralysis, and the loss of the faculty of articulate language continued for six days, when, being asleep on his couch, he suddenly started up, and was heard to say three times, "A man in the river!" From this moment speech was restored, and when I saw him an hour afterwards, he told me that he had dreamed that a man was falling into the river. The mental shock produced by this dream was salutary, for it resuscitated the previously dormant faculty of articulate language.

Surely we cannot, for one moment, assume that in these cases there can have been any structural lesion of the brain, any *material* damage.

But I may be told,—granted the truth of your statements, surely you must admit that man speaks by and through his brain. Most assuredly I do. I admit that a certain normal and healthy state of cerebral tissue is necessary for the exterior manifestation of the faculty of speech, but that is a very different thing from saying that speech is located in this or that particular portion of the brain. Permit me to illustrate what I mean by an allusion to a passage in Plato's celebrated dialogue on the Immortality of the Soul, where a disputant with Socrates inquires if the soul is not like the harmony of a lyre, more beautiful, more divine than the lyre itself, but yet is nothing without the lyre, vanishing when this instrument is broken. For the word *soul*, substitute *speech*, and for *lyre*, substitute *brain*. The instrument, *i. e.* the brain, may be damaged, and speech may become impossible, but that does not constitute the brain the *seat* of speech, although it is undoubtedly the instrument by which this attribute becomes externally manifested.

In conclusion, I desire it to be distinctly understood that I deprecate all idea of dogmatically urging my views upon this Society. I wish also to repeat that I entertain no preconceived hostility, no prejudice whatever, against Mr. Darwin, and I most certainly decline to be classed among those who would reject the doctrine of evolution simply from any fancied notion that its adoption is derogatory to man's position in the scheme of nature. Nor should I reject it on the ground of any antagonism between it and the power of the Deity, for the same Power that planned the glorious temple of Nature, which has "the earth for its emerald floor; its roof the sapphire

firmament; the sun and stars its pendent lamps; its music the murmur of streams, the pealing thunder, and the everlasting roar of ocean;"—I say this same Power could easily have caused us to pass through the probationary stages of ascidian, fish, reptile, monkey, and on to man, *if it had so willed it*; but as science has failed to show that it is so, I pin my faith to the story in the grand old book, which tells us that man was created in the divine image, and I accept the tradition that Man sprang *as Man* direct from the hands of his God.

Physiologists of every clime have for years been trying to connect the faculty of speech with some definite portion of the brain, with what result my preceding remarks will have shown. If the scalpel of the anatomist has failed to discover a *material locus habitandi* for man's proud prerogative,—the faculty of *Articulate Language*; if science has failed to trace speech to a "*material centre*," has failed thus to connect matter with mind, I submit that speech is the barrier between man and animals, establishing between them a difference not only of *degree* but of *kind*; the Darwinian analogy between the brain of man and that of his reputed ancestor, the ape, loses all its force, whilst the common belief in the Mosaic account of the origin of man is strengthened.

A discussion ensued, in which the Rev. J. W. Buckley, Mr. R. Dunn, the Revs. Dr. Barkley, J. H. Titcomb, J. Hill, D.D., V. Edwards, and R. B. Girdlestone; Mr. E. Haughton, M.D., Mr. J. A. Fraser, M.D., Mr. Hayward, and Capt. F. Petrie took part. Dr. Bateman having replied, the Meeting was then adjourned.

APPENDIX.

A LONG public controversy upon the foregoing paper having arisen outside the Victoria Institute, I venture to ask permission to refer to the main arguments of those who have taken up views opposite to my own, and to say a few words in reply. It has appeared strange that several who have taken part in that controversy should seemingly, and without sufficient warrant, claim for man a descent from the anthropoid ape, and with an ardour reminding one of those who, in former days, strove with so much anxiety to trace their ancestry to some on the roll of Battle Abbey. Whilst acknowledging the earnestness of my opponents, I cannot see that they have in the smallest degree weakened the position taken up in my paper, which was, that in language we possessed a difference of *kind* between Man and the Ape, which Mr. Darwin asserts his inability to find.

My first opponent enters the list with the assertion that language is not an attribute *universally* belonging to the human race, and that there are tribes of savages who have "*nothing of the kind*," adding, that if such be the case, "Dr. Bateman's argument falls to the ground." Of course it does, and I stake my anti-Darwinian position upon the point thus raised. Let us see what he advances in favour of his theory. He refers me to a well-known book of travel, the "*Voyage in the Beagle*," where it is stated that the Fuegian savages can only *cluck* like a hen. Now, I have referred to the passage to which my attention is called, and I find that this description of the Fuegian savages is by Mr. Darwin himself, who was the naturalist to the expedition in which the *Beagle* was engaged. From Mr. Darwin's account of this singular race, it is evident that they *did* possess articulate speech, for although they gave no evidence of conversational powers, Mr. Darwin says, "They could repeat with perfect correctness each word in the sentence addressed to them, and they remembered such words for some time." Hence it is evident that they possessed the faculty of language, although in an imperfectly developed form. Now these Fuegians are described in "*The Descent of Man*," as ranking amongst the lowest barbarians; the lowest barbarians, therefore, not only possess the power of speech, but are capable of even learning a foreign tongue, for those brought over to England in the *Beagle* are actually described as being able to talk a little English.* The acquisition of articulate language is, in a great measure, the result of imita-

* "*Narrative of the Surveying Voyages of the Adventure and Beagle*," vol. ii. pp. 2, 121, and 189.

tion. Bring a Fuegian to England, and give him time, and he will talk. Put a monkey under training for any number of years, and he will never evince the slightest capacity for the acquisition of language.

In a short reply to this opponent, I pointed out the palpable error as to his statement about the Fuegians. In a subsequent letter he alluded to "the immense amount of evidence we possess which proves that many tribes of savages do exist who do not possess articulate speech;" and supported this statement by a reference to the Veddahs of Ceylon, described in Tylor's "Early History of Mankind." Now, on referring to page 77 of this interesting book, I find the paragraph which has misled my opponent, who evidently quotes only as far as suits his purpose, for if he had turned over another leaf, at page 78, he would then have found that Mr. Tylor totally denies the accuracy of the statement that the Veddahs have no language, and does this by combating the very paragraph which my opponent quoted, as will be seen by the following extract :—

"Mr. Mercer seems to have adopted the common view of foreigners about the Veddahs, but it has happened here, as in many other accounts of savage tribes, that closer acquaintance has shown them to have been wrongly accused. Mr. Bailey, who has had good opportunities of studying them, contradicts their supposed deficiency in language, with the remark that he never knew one of them at a loss for words sufficiently intelligible to convey his meaning, not to his fellows only, but to the Singhalese of the neighbourhood, who are all more or less acquainted with the Veddah patois."

This question as to whether language is an attribute universally possessed by the human race, is such an important one, as far as the present controversy is concerned, that I wished to corroborate my views by an appeal to the distinguished African traveller, the Rev. Dr. Moffatt, whose long residence amongst savage tribes renders his testimony peculiarly valuable, and his opinion is so decided in reference to the particular point we are now discussing, that I think it well to insert his letter.

"Brixton, June 13th, 1872.

"DEAR DR. BATEMAN,—With regard to speech being the dividing point between man and the brute, I perfectly agree with you. This barrier has never been, nor ever can be overleaped, and it appears to me extraordinary that any one can think otherwise. I have had much intercourse with the bushmen in the interior of South Africa, and they may be set down as the lowest grade of humanity in that country. In some respects their language has a resemblance to the clicking language of the Hottentots. When taken into service they readily learn to speak fluently the languages of English, Dutch, and Sechuana. They are certainly the most degraded race to be found in the interior. Villages, folds, or flock, they have none, but move about in search of game, roots, wild honey, and are emphatically children of the desert.

"Of all the reports I ever heard respecting interior tribes, I never found that the idea was ever entertained that human beings existed that did not possess a language.

"By-and-by, when Dr. Livingstone shall arrive among us, he will no doubt tell us strange things; but nothing, I believe, that can possibly sanction Darwinism.—I am, my dear Sir, yours, &c.,

"ROBERT MOFFATT."

My next opponent asks me "to believe that language is in itself nothing save the expression of some thought?" Who denies this, and how does this discovery affect the question at issue? Further on he says, "the difference in *kind* between a man and a brute is not the *mode* of expression, but the thing

expressed—it is mind, not sound." Now, if it would afford him any gratification, I should be quite willing to make a concession to him, and to substitute the *indefinite* for the *definite* article, and to call language *a*, not *the*, difference of kind between man and animals. The fact that other differences of kind may exist does not in the least affect my position. But, in order to prove that mind is a difference of kind between man and the brute, he must prove that the latter has no trace whatever of mind. The elephant, who mortally crushes the boy, who, an hour before had pricked his trunk with a pin, connects a definite idea with a definite act; and the punishment he inflicts on the boy is evidently the result of a mental process. I maintain, therefore, that animals possess a *minimum* amount of mind, although in a state so rudimentary that all comparison with that of man is impossible. However much, therefore, I differ from Mr. Darwin's main theory, I am by no means prepared to dispute his statement that the difference in *mind* between man and the higher animals, great as it is, is certainly one of degree only, and not of kind.*

The question of the "*Missing Link*" was next introduced by a well-known geologist at Norwich (Mr. Harmer), who attempted to answer a great objection to the doctrine of evolution, which is "that none of the intermediate forms between man and his supposed progenitors are known to us, either in a living state or in a fossil condition." As this feature of the controversy is foreign to the object of my paper, I will not allude to it further than to say that Mr. Harmer's position was attacked, and his arguments successfully answered by the Rev. W. P. Lyon, the Rev. J. W. Buckley, and Captain F. Petrie.

One of the Norwich evolutionists complains that I use Scripture to refute Darwinism. I beg to say I do nothing of the kind, and there is nothing in my paper to justify such a construction. I use Science to show that language is the difference of *kind* between man and animals, which Mr. Darwin seems to stand in need of; and having, however imperfectly, combated his views from a linguistic point of view, I *incidentally* call attention to the fact that Science corroborates Holy Writ, just as Bishop Colenso and others contend that it controverts it. This is a very different thing from the illogical process imputed to me of bolstering up scientific views by appealing to the authority of Scripture.

In one or more of their letters, the evolutionists seem to deprecate any attempt to reconcile Science and Scripture. They willingly concede to the free-thinkers of the day the right to use Science for the purpose of subverting religion, but they look with a jealous eye upon those who seek to point out the analogy between the two. May I ask them what value they would attach to any work on the early history of our island, that contained no allusion to "Cæsar's Commentaries"; and, surely, it would be equally monstrous to consider any theory as to the origin of Man without, at least, a reference to the Book of Genesis,—the first, if not the only book, which professes to enlighten the human race as to its origin.

I doubt not that many of those who have differed from me are serious, thoughtful men, who would not knowingly propagate a dangerous doctrine; but I must think they cannot have realized the ultimate consequences of their proposal to ignore the Book of Genesis in any search after truth, simply because, in such a search, the aid of Science may also be required.

* If further evidence is required upon this point, I refer the reader to the *Transactions of the Victoria Institute*, vol. v. page 309, where he will find several facts recorded corroborative of my views that animals possess a minimum amount of Mind.

I am aware that it may be urged that the great truths of Scripture cannot be seriously affected by the evolution theory, since many sound theologians no longer contend for the literal and verbal inspiration of the Bible. Now, this is not a question of mere *verbal* accuracy. Darwinism is not merely inconsistent with this or that particular line or passage, but is incompatible with the whole spirit of the Bible, where at almost every page, the idea of a personal Creator is implied ; whereas the evolution theory abolishes all idea of creation in the ordinary sense of the term.

Did I not desire to avoid trespassing too much upon the space which has been so kindly accorded to me, I could strengthen my argument by quotations from Lord Chancellor Hatherley's last work, "The Continuity of Scripture," which book I recommend to the careful perusal of all those who are interested in this important subject.