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ON THE LOCALISATION OF THE FUNCTIONS OF THE
BRAIN, WITH SPECIAL REFERENCE TO THE
FACULTY OF LANGUAGE.

By JAMES HUNT, Ph.D., F.S.A., F.A.S.L.

(Historical part continued from p. 116, No. 24.)

IN the preceding articles it has been abundantly shown that the fundamental principle that the brain is an aggregate of different parts, each subservient to the manifestation of some intellectual phenomena ; and that the dispositions of men may be ascertained from the external form of the head, had been promulgated for many centuries before the time of Gall.* It was, however, reserved for Gall to infuse new vigour into the old doctrine of localisation, and to devise a system which was further elaborated by his disciples, and which constitutes now what I have elsewhere called the "bastard science of phrenology."† It would, however, be most unjust to make Gall responsible for all the sentimental cant and arrogance of those who have called themselves his disciples. Strange as it may appear, few such men as Gall have had a smaller number of disciples than this celebrated German physiologist and physiognomist. Gall appeared at a time when the whole of Europe was in a state of excitement, and his teaching was looked upon as tending to promote revolutionary ideas, materialism, and all the rest of the popular bogies in vogue even in scientific circles to the present day.

It is not now my intention to write the life of this remarkable man. Gall was, however, neither a prophet nor a very original thinker ; but he was a close and patient observer of nature. He was, indeed, more than this : he was one of those rare instances in humanity who combined in his own person the careful observer with the acute and logical reasoner. Gall has had few, if any, followers worthy of him ; the disciples have all been vastly inferior to their master.

We have said that Gall revived the old doctrine of localisation, and that this theory is now, or was until lately, known under the name of "Phrenology, or the doctrine of the mind." Alas ! how poor Gall would have repented being the founder of such a jumble as modern phrenology ! How his good sense would have revolted from having

* Franz Joseph Gall was born at Tiefenbrunn, 19th of March, 1758, died at Paris 1828.

† "A mixture of Physics and Metaphysics," see address to Dundee Anthropological Conference, *Anthropological Review*, No. 20, Jan. 1868, p. 77.

his observations on the "functions of the brain," called "phrenology or the doctrine of the mind!"

Gall has been in this respect nearly as unfortunate as Blumenbach, who, we are told by a recent writer,* was the "founder of ethnology." It is hardly necessary to observe that Blumenbach never invented or once used the word "ethnology"; although it is not so generally known that Gall never coined or used the word "phrenology." It is not a little remarkable that the fame of both these great men should have to suffer for the indiscretion of their so-called disciples. Blumenbach founded a special branch of science which he named over and over again "Anthropology." Gall in like manner elaborated the observations of his predecessors on the functions of the brain, or, in classical language, the science of encephalotomy, and called it "a system of physiognomy." When Gall first published his lectures some of his followers called his system "the science of craniology." Against this and all such names Gall protested, and said that such names misrepresented his labours, and that he was concerned in the first place with the functions of the brain, and in the second with the physiognomy of the skull.

We must, therefore, do the same justice to Gall as to Blumenbach, and never either call the one a phrenologist or the other an ethnologist. Gall cared no more about the nature of the mind than Blumenbach did about the composition of nations. Both the aggregate of phenomena called mind and the perhaps heterogeneous concourse of atoms constituting nations lie outside the domain of the science which they respectively founded.

It signifies little for science who it was that was so ill-judged as to describe observations on the functions of the brain as the doctrine of the mind, but the following facts are worth mentioning. The originator of the word "phrenology" was Dr. Forster. It gives no small insight into the character of one of Gall's so-called disciples—Dr. Spurzheim—that he claimed to have originated this word himself. Notwithstanding all these attempts to mislead the public as to the real nature of Gall's observations and theory, there now seems to be no doubt that the odium which Gall has incurred from having his name mixed up with phrenology will be as effectively removed as the name of Blumenbach has been vindicated from being the founder of ethnology. A stray writer here and there may yet try to sully the reputation of Gall by identifying his name with a mongrel science he never founded: but it is evident that the time has now come when scientific men are prepared to render equal justice to the founder of the science of mankind, or anthropology, and the founder of the science of the functions of the brain, or encephalotomy.

* Vide Professor Huxley, *Fortnightly Review*, No. 3, p. 263.

Gall's system consists essentially of two distinct propositions: first, in the assumption of a number of distinct cerebral organs for the different mental phenomena—organology; secondly, in the determination of the respective cerebral organs by the inspection and palpation of the cranium, which may be termed cephalonomy, or organoscopy.

A single glance at these propositions shows that they are in some respect independent of each other; for organology, *i.e.* the assumption of a plurality of cerebral organs, for different functions, may be true, and may form an important and reliable basis for the great science of encephalonomy, whilst cephalonomy, *i.e.* their determination by the external form of the cranium, may be false. On the other hand, cephalonomy in the above sense can have no existence as a science unless organology be true.

I wish it to be well understood that I am not dealing now with the whole of Dr. Gall's observations and theories; much less do I purpose now to attack or defend in detail the modern exponents of his system. Gall, like all other real scientific physiologists, was a student of the functions of organic structure. That he was not free from what is the great weakness of scientific men of the present day, *viz.*, the enunciation of speculative opinions, must be admitted; but the real bent of Gall's observations was far more sound and scientific than is the conduct of many who now attack his doctrines. We are not now called on to accept Gall's theories; but in duty bound we have to verify his observations. The present systems of phrenology, with all their assumptions and erroneous inferences, I do not hesitate to assert my belief will soon become a thing of the past. It is only by their complete destruction that we can ever hope to establish a reliable science of encephalonomy and cephalonomy, based on correct and lasting scientific principles.

All true science must, from its nature, be progressive: and this the modern elaborated system of "the doctrine of the mind" can never be. Let us all acknowledge most humbly that we know nothing of the "mind" apart from organisation. All our knowledge as scientific observers can alone be obtained by examining structure in action. Where structure is at rest there are no mental phenomena. Different organic forms when associated with different structures necessarily give rise to different phenomena. This is a law of all organic life, and is as applicable to the human brain as to any other organic structure.

Dr. Gall gave his first lectures on "Schädellehre" in Vienna, in the year 1796. The simple and tangible manner in which he appeared to lay open the secret workshop of human mental phenomena to profane inspection caused great excitement among the ignorant public and

great consternation among the theologians, mystic philosophers, and court impostors of the time. This coalition of rabblecraft, priestcraft, philosophycraft, and courtercraft proved too strong for Dr. Gall. His lectures were forbidden, and he sought an asylum in Paris, where henceforth he fixed his residence, and where he died in 1828, and was buried in the cemetery of Père la Chaise. Gall's head is now in the Natural History Museum of Paris.*

At Rome the Pope paid the same compliment to Gall as he did to Copernicus. In Germany Kotzebue played the same part as Aristophanes of old, and made Gall the laughing-stock of the people. The philosophers vented their rage at their occupation being taken away from them by a mere student of the functions of the brain. Schaller said that the theory was "so indefinite and presumptuous as not to be embarrassed by any facts it meets with." Jessen also thundered against organology, and joined with Volkmann, the physiologist, in misrepresenting the real character of Gall's theory. They charged Gall with only estimating the quantity and not the quality of the brain. This misrepresentation has been continually reiterated down to the present day. Gall, however, found zealous supporters in Reil and Loder in Germany, and Vimont and Broussais in France. Professor Bischoff, in his *Exposition of Gall's System* (Berlin, 1809), says :—

"You must see and hear the man yourself to find out how free he is from all charlatany and transcendental enthusiasm. Endowed in a rare degree with acuteness and a talent for induction, grown up in nature and in constant intercourse with her, he grasps all the phenomena in the province of organic beings, compares those, which had hitherto been overlooked or superficially observed with the greatest ingenuity, draws his conclusions, and lays down principles which are the more valuable because they are purely empirical, and merely repeated after nature."

Hufeland wrote a similar estimate of him in nearly identical terms.

In England Dr. Gall has had few thorough-going disciples ; but of these I may specially mention the late Drs. Engledue and Elliotson, and Mr. H. Atkinson, the authors of *Man's Nature and Development*. The great mass of the phrenologists of the present day are followers of Spurzheim and Combe. As an anatomist, justice has been done to Gall by Mr. Green, Mr. South, and Mr. Solly. On this point his merits

* According to Dr. Fossati, an intimate friend of Gall, the cranioscopic examination of Gall gave the following diagnosis : locality, sense of persons, language, number, order, tune, colour, constructiveness, were all feebly developed ; whilst comparison, causality, individuality, eventuality, and firmness were uncommonly large.

are unquestionable and I need only quote the emphatic words of the last-mentioned distinguished anatomist,* who says :—

“Every honest and erudite anatomist must acknowledge that we are indebted mainly to Gall and Spurzheim for the improvements which have been made in our mode of studying the brain.”

Mr. Solly observes, respecting the physiological pathological aspects of this question, that the brain†—

“Is made up of many instruments, each having its individual function to perform. The symptoms of the disease will, therefore, vary according to the portion which is diseased. It is true that all the ganglia within the skull are so closely united that any single ganglion can scarcely be affected without the rest sympathising. Still inflammation is sometimes restricted and the symptoms peculiar.”

The history of the origin, rise, and decay of phrenology is a subject of not only great interest, but one from which many practical lessons may be learnt. Looking at the question as a whole, I cannot but think that it has deserved its present fate. Much has been said against practical organoscopy, and no doubt a great part of this censure has been well deserved. I know of one remnant of the old Scotch Metaphysical Phrenological School, who has devoted the last forty years of his life to the subject of organology ; and although possessing a skull of considerable circumference, has yet, during the whole of this period, never done anything either to advance our knowledge of the “innate faculties of the human mind,” or to correct any of the aberrations of his predecessors. This is, I believe, not a solitary instance, but one of many of a like character, tending to illustrate the stagnant character of the “doctrine of the mind.” Let us hope that the question of the functions of the brain, in relation to mental phenomena, is now finally emerging both from the theological and metaphysical stages through which it has necessarily had to pass.

I am painfully conscious of the large amount of ignorance and prejudice which exists respecting Gall’s theory, partly on account of the odium brought upon it by some of its English disciples.

Much of the prejudice is, however, due to another cause. Gall’s theory, if true, unmasks all impostors. No man appears to a disciple of Gall other than he is ; and this is utterly repulsive to some men of high scientific and social position.

Having stated this much on the general question of the localisation of the functions of the brain, I shall confine myself, for the present, to the history of the localisation of the faculty of language and speech. The determination of the organ of language by the conforma-

* *The Human Brain*, by Samuel Solly, F.R.S., second edition, 1847, p. x.

† *Loc. cit.*, p. 396.

tion of the eye concerns us here only so far as it was the starting-point from which Gall proceeded. It was the *external* aspect of the eye, its prominence in certain of his schoolfellows, which struck the boy Gall ; and it was only at a later period, when reasoning on this fact, and tracing the external sign to an internal cause—the expansion of a certain portion of the brain—that Gall felt induced to place the organ of speech in the anterior lobes.

In all the biographies of Gall, we are told that already when a boy at school he was a keen observer of the differences of talents among his schoolfellows ; how he observed that his “ox-eyed” companion, as he called him, invariably beat him in learning lessons by heart ; and how, whilst studying medicine at the University of Vienna, he found among the students, professors, and other literary characters of great linguistic attainments, his early impression fully confirmed—namely, that prominent eyes indicate a talent for languages ; and how, proceeding step by step, he fancied that he found external marks for each separate talent or propensity, and that he could discern the intellectual and moral character of an individual by his cranial formation.*

As what Gall actually said on the faculty of language and verbal memory has frequently been misrepresented, I shall quote his own words. It will thus be seen that he makes a difference between verbal memory and the faculty of language ; but he connects their cerebral organs, and places them both in the frontal convolution, without, however, pointing out their respective limits :—

“I consider as the organ of the memory of words that part of the brain which rests upon the posterior half of the supra-orbital plate. We have not in the engravings indicated by figures the portion in question, as we look upon the sense of words to be only a fragment of the sense of language, of speech.”†

Sense of Language ; Talent of Philology.—“When the greatest portion of the middle part of the inferior anterior convolutions placed upon the orbital plate is much developed, this wall is not merely flattened, but even depressed ; hence results a peculiar position of the eyes. In such a case the eyes are both prominent and depressed towards the cheeks, so that there is a certain interval between the bulb

* See Huarte, in the preceding article.

† *Sens des mots, sens des noms, mémoire des mots, mémoire verbale.*

“Je regarde comme l'organe de la mémoire des mots, cette partie cérébrale qui repose sur la moitié postérieure de la voûte de l'orbite. Nous n'avons pas donné dans les gravures des chiffres particuliers à la partie dont il est question, parceque nous avons considéré le sens des mots comme n'étant qu'un fragment du sens du langage de parole.”—*Sur les Fonctions du Cerveau*, &c. Par F. J. Gall. Paris : 1825. Tom. v, p. 18.

and the superior arch. The bulb, thus depressed, acts upon the lower arch and increases the curvature. This strong curve produces in the living subject, when the eyelids are open, the appearance of a little sack or pocket filled with water; hence the name 'pocket eyes.'

"Persons who have eyes so formed possess not merely an excellent verbal memory, but they have a peculiar disposition for the study of languages, criticism, in general for everything relating to literature. They write dictionaries, history; they are much adapted to exercise the functions of librarians and conservators; they collect the treasures of all centuries; they compile learned volumes; they fathom antiquity; and if at the same time they are endowed with some other faculties, they gain the admiration of the world for their great erudition."*

Gall does not seem quite clear about persons with prominent eyes having always a good memory. This much, however, he says is certain, that some persons who learn easily by heart may have a bad memory for names; whilst others easily learn names, but cannot recite prose or verses.

Gall also rejects the assumption that thought is impossible without speech. The organs of our faculties, he observes, are alone anterior to the acquisition of speech, and manifest themselves by gestures, sounds, or by both.

If it were true that without signs we could not think, and that only articulate words lead us to abstract ideas, children could not think before they have learned to speak. But experience shows that children have acquired an infinity of notions before speaking.

* *Sens du langage de parole; talent de la philologie*, p. 30.

"Lorsque la plus grande partie de la portion moyenne des circonvolutions inférieures-antérieures placées sur le plancher supérieur de l'orbite ou sur la voûte, est très développée, cette partie est non seulement aplatie, mais même déprimée. Il en résulte une position particulière des yeux. Dans ce cas, les yeux sont à-la-fois à fleur de tête et déprimés vers les joues, de façon qu'il se trouve un certain intervalle entre le bulbe et l'arcade supérieure. Le bulbe ainsi déprimé agit sur l'arcade inférieure et augmente l'échancrure. Cette forte échancrure produit chez le sujet vivant, lorsqu'il a les paupières ouvertes, l'apparence d'une petite poche remplie d'eau, de là le nom d'yeux pochetés.

"Les personnes qui ont les yeux ainsi conformés possèdent non-seulement une mémoire de mots excellente, mais elles se sentent une disposition particulière pour l'étude des langues, pour la critique, en général pour tout ce qui a rapport à la littérature. Elles rédigent des dictionnaires, écrivent l'histoire, elles sont très propres aux fonctions de bibliothécaire et de conservateur; elles rassemblent les richesses éparses de tous les siècles; elles complètent de savans volumes; elles approfondissent les antiquités, et pourvu qu'elles aient d'autres facultés encore, elles font l'admiration de tout le monde par leur vaste érudition."

Gall's theory as regards the localisation of the faculty of language in the anterior lobes was not long in finding a skilful advocate.

On the 21st of February, 1825, Dr. Bouillaud read before the *Académie Royale de Médecine* a memoir, entitled *Recherches cliniques propres à démontrer que la perte de la Parole correspond à la lésion des Lobules Antérieurs du Cerveau, et à confirmer l'opinion de M. Gall sur le siège de l'Organe du Langage articulé.** (Clinical researches demonstrating that the loss of speech corresponds with the lesion of the anterior lobes, and confirming the opinion of Gall as regards the seat of articulate speech.)

As this treatise was not only the first written on this subject, but contains the gist of the whole matter, I shall quote from it at some length.

"I don't know how it is," says Dr. Bouillaud, "that it has hitherto not been taught in the schools that the movements of the speech-organs required in the brain a special centre—a truth which appears to me so simple and natural. In order to demonstrate this, we can show by observation that the tongue and its allied organs may be paralysed isolately, and that they may preserve their movements, whilst other parts—the limbs, for instance—are deprived of their motions. This I shall prove first, and then I shall determine the seat of the nervous centre which governs the mechanism of the organs of speech."

Dr. Bouillaud then gives three cases in which there was loss of articulate speech with preservation of the intelligence, as the patients understood everything, and could express their ideas by gestures and writing. In two of these cases the autopsy showed that the anterior lobe of the brain was in one instance reduced to a purulent mass, and in the other the anterior lobe was softened. The third patient recovered.

"It is not sufficient," says this distinguished Pathologist, "to know that there exists in the brain a particular *force* destined to *co-ordinate* the marvellous movements by which man expresses his feelings and communicates his ideas,—it is important to know the seat of this force in the brain. Now, from my own observations, and from those I have collected from other authors, I am of opinion that the nervous principle in question, which may be called the legislating organ of speech (*organe législateur de la parole*), resides in the anterior lobes of the brain."

After illustrating his position by numerous cases, Dr. Bouillaud arrived at the following conclusions:—

1. In man the brain plays an essential rôle in the mechanism of a great number of movements: it governs all that are subject to the dominion of the intelligence and the will.
2. There exist in the brain special organs, each of which has under its dependence special muscular movements.

* This memoir was also published in vol. viii of the *Archives Générales de Médecine*, 1825, from which we quote.

3. The movements of the speech-organs particularly are governed by a special, distinct, and independent cerebral centre.

4. This cerebral centre occupies the anterior lobes.

5. The loss of speech depends sometimes on the loss of verbal memory ; sometimes on that of the muscular movements requisite for speech, or what amounts to the same thing ; sometimes on the lesion of the grey matter ; and sometimes on the lesion of the white substance of the anterior lobes.

6. The loss of speech does not involve the loss of movements of the tongue, considered as an organ of prehension, mastication, and deglutition, nor the loss of taste, which presupposes that the tongue has in the nervous centre three distinct sources of action—an hypothesis, or rather a truth, which admirably accords with the presence of a triple nervous organ in the tissue of the tongue.

7. Several nerves have their origin in the brain itself, or rather are connected with it by anastomotic fibres. The nerves animating the muscles which concur in the production of speech, for instance, take their origin in the anterior lobes, or at least have necessary communications with them.

In 1848, M. Bouillaud read a second memoir before the Academy, entitled, *Nouvelles Recherches*, etc., in which the number of cases in support of his views amounted to many hundreds. He then offered a premium of five hundred francs for any case of loss of speech without lesion of the anterior lobes.

The question of the localisation of the intellectual faculties, and especially of the faculty of speech, made, nevertheless, but little progress until 1861.

In February, 1861, a communication to the Anthropological Society of Paris by Dr. Gratiolet, relative to the signification of the volume of the encephalon, gave rise to long and interesting discussions on the volume and form of the brain, and on the principle of cerebral localisation. Dr. Auburtin, a pupil of M. Bouillaud, chiefly confined himself to the faculty of language, and considered that its seat in the frontal lobes, as sustained by M. Bouillaud, was abundantly proved both by traumatic cases, which may be considered as so many vivisections, and by pathological cases. He knew of no case of the destruction of both frontal lobes and the preservation of speech. He was ready to renounce the doctrine of M. Bouillaud should such a case occur. He alluded to a patient named Bach, in the Hospital for Incurables, who had lost his speech, but preserved his intelligence. This man was dying, and he diagnosed a softening of the anterior lobes ; if these should be found in a condition of integrity, he would give up his opinion. The autopsy of this patient showed a lesion of

the third frontal convolution of the left anterior lobe. Dr. Broca was at that period still sceptical as regards special localisation ; for we find him, at the sitting of the Anthropological Society, May 2nd, 1861, thus expressing himself :—

“ I have at the last sitting shown you the brain of a man in whom a lesion of the frontal convolutions had abolished speech (the brain of Tan, see cases). It was a curious coincidence that this case occurred at the time when MM. Gratiolet and Auburtin carried on a discussion on the faculty of speech. But although I am rather inclining towards the opinion of M. Auburtin, I had no intention of taking part in the debate. I am neither for nor against special localisations. I merely try to lay down a general principle in considering the convolutions, not separately, but by groups, or, if you like, by regions.”*

From this period Dr. Broca omitted no opportunity of investigating this subject, until he arrived at the conviction that the principle of localising the faculty of speech in the frontal lobes was correct in the main. He went further, and not only placed the faculty of speech in the left hemisphere, but restricted the limits of this faculty to the posterior half of the third left frontal convolution. Thus M. Broca became the chief exponent of the doctrine which now agitates not only Anthropologists but the scientific public generally.

What induced M. Broca to confine the lesion to the left hemisphere, and to the third frontal convolution, had better be stated in his own words used at a sitting of the Paris Anthropological Society, April 2, 1868 :—

“ I communicated to the Anatomical Society a case of loss of speech, which I call *aphemia*, in which the lesion occupied the third left frontal convolution. Soon after, I dissected an old aphemic subject who, during his life, had only five words at his disposal. We found an old hemorrhagic focus about two centimetres from the posterior extremity of the third left frontal convolution. Since that time M. Charcot had three aphemics whose cerebral lesions were exactly in the same spot. M. Gubler presented a similar case to the Biological Society. But here are two very important cases.—M. Charcot presented to the Biological Society a brain of an aphemic in which, as he stated, the lesion was in the parietal lobe. I confess I was rather startled, but when I dissected the membranes I found that the softening ran along the fissure of Sylvius and reached the third convolution, which is destroyed in its lower half. M. Duchenne (de Boulogne) told me one day that there was a case under Dr. Trousseau, in the *Hôtel Dieu*, opposed to my idea of the seat of articulate speech. I went to the hospital and found indeed the parietal lobe diseased ; but on introducing the scalpel into the third convolution I announced that a lesion would be found, and effectually the convolution was found altered to

* *Bulletins de la Société Anthropol. de Paris*, 1861, p. 320.

the extent of three centimetres. Here then are eight cases in which the lesion was in the posterior third of the left frontal convolution, which appear to me sufficient to afford strong presumptive evidence in favour of my theory. I nevertheless await new facts.*

The most powerful adversary in France of Gall's Organology was unquestionably M. Lelut. In his treatise entitled *Qu'est-ce que la Phrénologie* (Paris, 1836), and in that bearing the title *Rejet de la Phrénologie*, published in 1843, he stigmatises phrenology as a pseudo-science. It is not a little remarkable that in this second work M. Bouillaud's name is not even mentioned. It is the usual, and perhaps commendable, practice to appoint a committee to report on a paper, and to select members holding different opinions on the subject-matter. We are, therefore, not surprised at the election of M. Lelut to serve on that committee, but we agree with him that holding such decided and *unalterable* opinions on the subject in question he ought, perhaps, to have declined the task.

Discussion in the "Imperial Academie de Médecine." Sitting of Dec. 6, 1864.—The Academy having charged MM. Bouillaud, Beclard, and Lelut to report on a treatise, entitled "Observations tending to prove the constant Coincidence of Speech disorders with Lesions of the Left Hemisphere,"† M. Lelut said that he regretted that the Academy had imposed upon him this task, which he ought to have declined. There are many points in physio-psychological science on which he was quite ready to modify his opinion, but there are some points on which his opinions could never be changed or modified. Of these are the relations which it is attempted to establish between certain mental faculties and certain parts of the nervous centre, and amongst these the attribution of the faculty of language to some part of the nervous system. This is neither more nor less than phrenology, and he had paid too much attention to this pseudo-science to recur to it. Such being the case, he would only speak in his own name, leaving it to his colleagues to express their own opinions separately. Dr. Dax, it appears, had collected about one hundred and forty cases, nearly all not of his own experience, in which speech disorders were always found connected with some lesion of the left hemisphere; the lesions of the right hemisphere producing no disorders of this kind. If such a fact were true, then the brain—that mysterious organ—would be still more mysterious. Dr. Lelut concluded by citing what he called

* "Bulletins de la Soc. d'Anthropol.," tom. iv, p. 202, 1863.

† "Observations tendant à prouver la coincidence constante des derangements de la parole avec une lésion de l'hémisphère gauche du cerveau," par Dr. G. Dax. Bulletins de l'Académie Impériale de Médecine," tom. xxx, Nos. 14 & 15, Avril 15 et Mai 15, 1865.

a very magnificent fact (*bien magnifique*), that of an epileptic in whom the whole left hemisphere was reduced to a pulpy mass, and whose speech was free to the moment of death.

M. Bouillaud, alluding to the "*fait magnifique*" cited by M. Lelut of the reduction of the whole left hemisphere into a pulpy mass, which lesion was not as much as suspected during life, said that such "magnificent facts" were nothing but the negation of all physiological and pathological science. They are open to great doubts, and may be considered as pseudo-facts. He would now, as M. Lelut has done, make his profession of faith in the following terms:—

"My experiments on living animals and my clinical observations have only enabled me formally to pronounce an opinion on two localisations proposed by Gall.

"1. The localisation of the faculty of language and of the faculty of articulate speech in the anterior lobes of the brain.

"2. The localisation of the generative faculty, or of the instinct of generation, in the cerebellum."

He had not only, as Gall has done, studied the purely intellectual element of speech, but also the mechanical element superadded to the former—viz., the movements requisite for articulate speech. After being convinced that the *co-ordinating* or legislating principle (*principe co-ordinateur ou législateur*) of these movements had its seat in the anterior lobes of the brain, he followed up his researches, applying them to the *intellectual element* of speech, and he found that this element also had its seat in the anterior portion of the brain. It was then that in the title of the memoir which he published on the subject in question, he announced that his researches confirmed the doctrine of Gall on the seat of articulate speech and verbal memory.

As regards the second localisation of the instinct of generation in the cerebellum, he had always rejected it, whilst respecting the fundamental principle of the plurality and speciality of the cerebral organs.

Dr. Bouillaud concluded his discourse in the following terms:—

"The simultaneousness of the lesions of the faculty of speech and of reading and writing, which is not uncommon, induces me to think that the seat of the principle of these faculties must be a near neighbour of the faculty of speech.

"It may be said that cases contradictory to ours as regards localisation have been brought forward. No doubt of it; but we have weighed these cases, and we have found that none of them unite the conditions of a *well observed* case.

"For twenty years past we have offered a prize of five hundred francs to the author of a *well conducted* observation of a contradictory kind, but no one has claimed the prize. Let our opponents offer a prize of five hundred francs for a *well conducted* observation of a lesion bearing exclusively on the anterior lobes of the brain, and they will

not have to wait twenty years before there will be many claimants for the prize."

Here it is necessary to observe that Dr. Bouillaud takes his stand on the following propositions—viz., that the act of speaking presents two distinct phenomena—the faculty of creating words, and the power of co-ordinating the movements necessary for articulation. It is this latter faculty which he calls *pouvoir législateur de la parole*, which he places in the anterior lobes of the brain. He says nothing about confining the organ of this faculty to either of the hemispheres, nor to any particular convolution of the frontal lobes. All subsequent efforts, especially those of M. Broca, were chiefly directed to circumscribe and better to define the limits of the cerebral organ of speech.

In the discussion at the Academy, April, 1865, M. Trousseau said :—

"We are not here to discuss either the doctrines of Gall or of Bouillaud, but a Memoir of Dr. G. Dax, son of Dr. Marc Dax, in which he endeavours to prove the constant coincidence of speech disorders and lesion of the left hemisphere."

"What is the symptom or the *ensemble* of symptoms which I call *aphasia*? I shall at once put myself at ease by refusing to give a definition. I know nothing, in fact, more difficult than to give a good definition."

"The aphasic is often paralysed, most frequently on the right side, so that we might believe that gesture and speech are obstructed by paralysis. Nothing of the kind. The man struck with hemiplegia who is not aphasic stutters; but he can still express his thoughts, although in an imperfect manner. He can write and draw, although badly. I call him an aphasic in whom the signs of thought cannot manifest themselves (*celui chez lequel les signes de la pensée ne peuvent plus se manifester*)."

Dr. Trousseau concluded as follows :—

"After what I have stated, it seems to me that we might arrive at the conclusion that aphasia is not a disease, but a symptom; that this symptom results nearly always from the perturbation of the various faculties of the intellect, especially of memory and attention. Numerous well observed cases equally authorise us to conclude that various regions of the encephalon concur to the formation of language, although the anterior lobes of the brain take the greatest part in it."

I have been unable to procure this memoir of Dr. G. Dax which gave rise to the discussion before the Academie. He refers in it to a treatise written by his father, Dr. Marc Dax, of Sommières, and read before the Medical Congress held at Montpellier in the year 1836. The title of the treatise was *Lésions de la moitié gauche de l'encephale, coïncidant avec trouble de la pensée*. In his own memoir Dr. G. Dax sustains not merely that the lesion in the loss of articulate speech is

always in the left hemisphere, but he limits the lesion to the anterior and external portion of the middle lobe, namely to the region adjoining the insula and the posterior part of the third left frontal convolution. In justice to M. Broca, who has been blamed for not mentioning Dr. Marc Dax, who, as asserted by Dr. George Dax, had long ago maintained that the lesions which destroyed the faculty of language had their seat in the left hemisphere, and that a paper to this effect had been read before the Medical Congress, held at Montpellier in 1836, we extract the following passage from Dr. Broca's brochure* :—

“I desire that it may no longer be believed that I sinned either from ignorance or from wilful neglect. The existence of the memoir of M. Dax, senior, was as little known at Montpellier as it was in Paris. After vainly searching the journals of 1836 for some account of this memoir, I requested M. Gordon, the librarian of the Faculty of Montpellier to institute inquiries. M. Gordon was not more fortunate than myself. The congress held its last sittings at Montpellier from July 1 to July 10, 1836. The *Revue de Montpellier* (1836, I, II) gives an abstract of the subjects discussed ; but the question of language is not mentioned. M. Gordon personally inquired of twenty physicians then resident at Montpellier ; but they knew nothing of such a memoir having been read. I will not, however, deny the authenticity of the said memoir ; for it may have been written for the congress, although not read. I merely wish to state that I could not guess the existence of a manuscript which has only been disinterred two years after my first publication on Aphemia.”

[To be continued.]

Anthropological News.

IN the course of a few days will be published a work, by Dr. C. M. Ingleby, a gentleman well known for his contributions to Elizabethan criticism, bearing the somewhat indefinite title of *Introduction to Metaphysics* ; it will be sold by Mr. Ayres (the Clerk of the Royal Society of Literature) at No. 4 St. Martin's Place, Charing Cross, in consequence (as we hear) of a disagreement between the author and his publishers. We have seen the table of contents of this work, which are very comprehensive, and of the greatest interest. It is somewhat difficult to state in a few words the exact drift of this book. It is intended to be introductory to a work to be called by the somewhat peculiar name of *Material Logic*. The Introduction comprises a sketch of the principal psychological problems which concern perception through the senses, and the functions of the intellect. Dr. Ingleby grounds himself on Kant, and is evidently so ambitious as to dream of a fresh outcome from the critical philosophy, distinct from those of Fichte and of Hegel. He seems to have carefully criticised the systems of Reid, Berkely, Kant, Hamilton, and J. S.

* “Sur le siège de la Faculté du langage articulé.” (Paris, 1865).