Considerations on the Mental State in Aphasia. By CONOLLY NORMAN.

THE subject of aphasia is one which has offered some of the most interesting problems presented to the physician for solution, and, although many remain unsolved, yet the study of aphasia has been more fertile of great discoveries as to the function than that, perhaps, of any other brain symptom or group of symptoms. The researches of Broca, indeed, were the beginning of localisation, and, as far as the cerebral cortex is concerned, formed the starting-point of any scientific knowledge which has since been attained.

The whole field of aphasia is full of interest—of practical interest to the physician and the surgeon, of interest to the scientific thinker, and of interest to the historian of our art, who will some day have to record the triumphs won therein as among the noblest which the human intellect shall have achieved in the mighty struggle it ever wages with Nature to wrest from her one by one her most recondite secrets.

To us who work in the comparatively limited sphere of practical psychiatry, aphasia has, besides its general or scientific interest, a further importance as bearing upon the question of how far a lesion, theoretically and according to our present lights, limited in extent, can affect that total of the higher nervous functions which we assume under the name of mind. How far, again, is the cerebral faculty of speech necessary for the maintenance of thought; how far essential to the education, the building up, of the mind?

The relation of words to thought is a subject which it is hard to discuss without departing from the biological and assuming the metaphysical, or at least the teleological position. That the process of thinking can be carried on without words Max Müller denies, but Preyer seems to show that the great philosopher of language is too absolute in this respect. Preyer points out that we cannot deny thought to the infant at a time before he has learned to utter a single word, and comes to the conclusion that primitive thinking is not bound up with verbal language. Of course, he in no way denies the importance of language to the further progress of the intellect; in fact he insists upon it. Marie,

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in an able and thoughtful article on the "Evolution of Language considered in connection with the Study of Aphasia," traces the origin of spoken and written language. Other animals, he tells us, than man have the innate power of emitting certain sounds whereby they communicate with each other. This he calls natural language; it is not taught. Besides this, man possesses the power of creating a conventional or artificial language. It is conjectured that the first step of this human language may have been onomatopoetic, but even the most primitive tribes are now so far removed from the earliest stage of language that this cannot be proved. Gradually enlarging, elevating itself, generalising, language has become the powerful machine which we know, "an instrument fabricated by the brain of man in order to fabricate the brain of man." He then follows the history of writing from its primitive condition, when it was a more or less rude drawing, to its present entirely conventional phonetic stage. Proceeding to consider the relations of aphasia to the growth of spoken language, he says that we are not allowed to suppose in the present state of our knowledge that any conventional acts or act acquired by instruction can have a special centre in the cerebral cortex, but that it needs must borrow the centre for the function concomitant to its execution. Now, as the function of spoken language has a special centre, it follows that this fact can only be explained through the gradual formation of this centre in a long succession of ancestors who have made use of spoken language. But, says Marie, written language is still more conventional than speech, still more an art that is taught to the individual. It is, moreover, even for the most highly educated, an art of yesterday in the history of the race. How, then, can written language have, as is almost universally held, special centres? On the contrary, this vast difference exists between spoken and written language, that the former proceeds in the individual from centres preformed for its production, the latter from centres merely adapted. He strives to confirm this conclusion by a consideration of the mistakes one commonly makes in writing—mistakes of letters similar in sound not in shape. He further points out an explanation of the phenomenon called by various authors subcortical alexia or pure verbal blindness. In this condition, it will be remembered, the power of writing is retained, though the patient cannot read words. Marie maintains, with Redlich and Higier, that this state of

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affairs is not due to a special lesion, but to the fact that the sufferer is a person to whom writing has become so familiar that he does not require the aid of vision, whereas when a person unaccustomed to writing is stricken with verbal blindness agraphia follows, as the individual is unable to execute the necessary movements of writing without the aid of the eye. From this, again, he infers the absence of any special centre for writing. He concludes by protesting against the profusion of localisations now in fashion in connection with aphasia, most of which are merely schematic or are founded on defectively interpreted facts.

Brissaud, analysing and refuting Marie's views, in an article on the centre for agraphia and on deaf-mutism, points out that the examination of deaf mutes shows that the distinction between preformed and adapted centres cannot be maintained. It is hardly to the purpose to say, as Brissaud does, that every act in the life of relation has to be learned, because learning to walk or run or jump is absolutely a different thing from learning to speak or write. Marie's contention that all our writing is phonetic in its origin is admitted; that is, the letters of the alphabet are designed, of course, to represent sounds; but regarded in itself each written letter is the inscription of a gesture—a muscular movement. Now, we make this record of a manual and digital muscular movement with a pen on a plane recording surface, and this constitutes writing. The deaf-mute, when he (as is commonly but very incorrectly said) speaks on his fingers, uses digital and manual muscular movements to convey his ideas, and in point of fact writes in the air. Writing on the plane and writing in space are identical (graphic and cinematic writing, as Brissaud calls them). But dactylology (= the dumb alphabet, writing in space, cinematic writing), though it may have a relation to uttered sounds in the mind of a teacher who hears, has no such relation in the mind of a deaf-mute learner who is absolutely incapable of comprehending such a relation. Here, then, we have the primary adoption of conventional signs in no way connected with speech. Why should we not suppose a preformed centre for their production? Or rather, why should we not apply to the speech centre the terms in which Marie speaks of the supposed graphic centre:—"Certain common centres presiding already over other processes of natural and spontaneous cerebral

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function"—("vision, movements of the limbs, &c.," *Marie;* "hearing, movement of the lips and tongue," *Brissaud*)—"are, in consequence of education, adapted to carry out, in addition, all which pertains to their functions in the operations of"—("written language," *Marie;* "spoken language," *Brissaud*). If the faculty of language is preformed, language should be identical for the whole race, as every man walks and runs in virtually the same way.

These views are confirmed by another consideration, which Brissaud does not mention—the untaught spontaneous codes which deaf mutes, who are otherwise intelligent, use for the communication of their emotions and thoughts. These are, of course, unrelated to sound. They are largely pictorial; representations, or abbreviated representations, of actual objects, but they are also conventional or arbitrary, and intelligent but untaught deaf mutes discover and make use of signs by which they express simple relations in time and space, and thus remove their code from the merely representative stage.

Nevertheless, whether through the influence of racial habit, or because the muscles of the speech organs are more flexible, there seems to be a special facility for their use in efforts of expression. This appears from the curious fact that deaf mutes who have been taught lip language use that mode of communicating with each other in preference to dactylology, though the latter has generally been learned earlier, and is probably less liable to erroneous interpretation.

The human faculty, which seems pre-eminently to distinguish man from the brutes, is the faculty of expression, the faculty of communication with others. Language subserves this faculty, and is its most important agent in the normal state; yet, as we have seen from the consideration of deaf-mutism, language is not essential to expression, though muscular movement is. Now, the faculty of expression is probably itself something superadded to the power of re-representation or registration in consciousness. The latter is probably always effected through the aid of a sign, this sign being some muscular movement. Possibly an imitative gesture of the limbs, of the facial muscles, or of the vocal organs, gives the clue to the earliest attempts. This muscular movement, or the memory of this muscular movement, is probably more easily recalled than the original sense object, hence the sign comes to be used in consciousness

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for the object. Thought becomes thus possible without immediate dependence upon sense impressions or their residua. Abstract ideas, general ideas, ideas of time and space, ideas of number, only become possible when signs have been adopted. In fact all ideas of relation are dependent upon symbols; and since thinking, as distinguished from mere memory of sense impressions, might be described as the perception of the relation between the objects of sense, the importance of symbols to our mental life becomes evident.

The value of this aspect of the matter appears when we consider that, if it be a true one, it would follow that with entire obliteration of the expressive faculty would be associated an entire destruction of the power of thinking. The condition of a man in whom this faculty is non-existent would be that of the beast that wants discourse of reason or that of the infant who may indeed display emotions, as a mere reflex, but is incapable of expressing them either by words or other signs.

There are certain conditions connected with aphasia which seem to support this view. A form of disturbed cerebral function has been described by Finkelnburg under the name of asymbolia. Heilbronner, who has recently described three cases, defines the affection as one which is denoted by the non-recognition of objects, in spite of the maintenance of the sensory functions, and while the patient's general condition of consciousness is such as permits the investigation of these symptoms. A patient of this kind, for instance, cannot deal with ordinary articles in daily use. Show him a cigar, a knife, and a match box, and he is unable to cut the cigar and light it. The author gives an account of the post-mortem appearances in two cases,—circumscribed foci of softening in the temporo-occipital lobes,—and dwells upon the fact that a limited disease of the brain, which may not involve any considerable portion of either hemisphere, is yet capable of producing a condition which reduces the mental functions to the level of the profoundest imbecility.

Starr has studied the same or a similar state under the name of apraxia, while Freud suggests the title agnosia. The best studies of the condition, however, are probably those of Pick. One of the patients described in his recent book suffered from slight cortical motor aphasia without word deafness, a

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slight degree of psychical deafness, marked psychical blindness, and marked loss of the psychical faculty of taste and smell (power of distinguishing objects by these senses). There was also slight right hemiplegia (without facial involvement), irregular reduction of both fields of vision, occasional disturbance of localisation of auditory impressions, and a moderate degree of enfeeblement of intellect. In this interesting case, circumscribed foci of softening of the cortex were found on the right side in the posterior half of the fusiform and lingual convolutions, on the left side in almost the entire cuneus and the posterior third of the lingual lobule.

In many other of these cases an element of general mental enfeeblement seems to present itself, inasmuch as the patients do not try to correct one sense by another, though the latter may be intact or relatively little affected. Herein the whole power of calling up the symbolic representations of objects seems defective. Thus, Rabus draws attention to the circumstance that a patient of his who suffered from psychical blindness, seldom or never attempted to obtain recognition of an object by touch as ordinary blind people so constantly do.

Certain cases of aphasia or phenomena akin to aphasia are, in the present state of our knowledge, extremely difficult to explain on any theory of localisation. Such is Grashey's case, which presented this feature that the patient could recognise objects, but could not name them, while on hearing the name he could at once point out the object. Grashey tells us that he at first was inclined to explain this schematically by supposing that the connecting path from the sound image to the object image was intact, while the path from the object image to the sound image was interrupted. Rejecting this too facile explanation, he proceeded to a more minute study of his case, and found that the patient showed a marked inability to retain for any time either object images, sound images, or symbols of any kind. If any object was shown him which he recognised, and he was asked a few minutes afterwards to touch the object which he had been shown, it was found that he had meanwhile forgotten what the object was. For the same reason he could not group together images of any class. If he was shown successively and singly the letters of a word, he could not tell at the end what the word was, for he had already forgotten the first letters, though he could read the word when it was presented to

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him in its entirety. Grashey, then, considered that the general enfeeblement of the perception (memory) accounted for the impairment in speech without supposing a localised lesion. The discussion of this case, first described many years ago, continues to excite interest. Störring, about two years since, proposed to explain the condition on the theory that, in the normal state, the reproduction of the sound image of the name belonging to anything is much more seldom associated with the perception of the object than is the representation (imagination) of the object with the hearing of its name. Hence the transition from the sound image to the object image, is easier than that from the object image to the sound. So with a general depression of the function of both centres the phenomenon observed would occur. Wolff, in a paper on disturbances of association, reports further observation on this case. He notes a general weakness of association, which the patient was able to overcome by the direct contemplation of an object with regard to which he wanted to speak. He further helped himself by writing down the name of the object. Thus, if he was asked the colour of leaves he looked out of the window in order to behold a tree, and then was able to write down the word "green." Looking at sugar he could indicate its visible properties, but did not know its taste until he put it in his mouth. He could not recognise a key by touch unless he, at the same time, saw another key. The conclusion come to by Wolff was that the patient found it impossible to call up associations in a purely abstract way, and could only find a word when he was supported by sensory perception.

In an interesting case which came under the notice of the writer of the present article, aphasia used to occur and last for a couple of days after apoplectiform seizures in general paralysis. While in this state the patient strove to speak spontaneously, and either could not or indulged in mere paraphasic gabble. If he was asked to repeat a word he generally failed, unless he was at the same time shown the object, when he usually repeated the name correctly. This was most remarkable with numerals. Asked to repeat "one, two, three, &c.," he was unable to do so. But, if the corresponding number of fingers, pencils, or the like were held up, as each numeral was named he repeated the name correctly; and this with some understanding, for if one uttered the word

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"three" and held up four fingers, the patient shook his head and remained silent.

In the case last referred to the conditions were temporary and of short duration, and so commonly are the states of aphasia preceding or following epileptic fits. But in perfectly permanent conditions of the aphasic order a remarkable variation in the intensity of symptoms is frequently to be observed, a fact to which Lissauer calls particular attention in his account of a case of psychical blindness. This suggests a general, or what might be called a functional, derangement, superimposed upon an organic local one or coincident therewith.

Bonhöffer has described a case of alcoholism which presented well-marked asymbolia, from which condition the patient recovered, with, however, a certain amount of psychical defect.

Cases of aphasia have been not uncommonly recorded in general paralysis. Probably more of these would have been noted but for the extreme difficulty of studying these conditions, at least in the advanced stages of that disease. Psychical blindness with dementia paralytica has been the subject of studies by Reinhard, Zacher, Stenger, and others. Paralexia in general paralysis has been carefully described by Rabbas and Salgò, and is, no doubt, a genuine symptom of paralytic dementia. In a few cases aphasia in general paralysis has been found to be due to distinct focal lesions. More often it appears to be connected with more widely-spread conditions.

Similarly, in senile dementia there is a particular liability, owing to the state of the vessels, to focal hæmorrhages; but without the existence of the latter various conditions of aphasic trouble occur. Schüle points out the resemblance of some of these to the commonest form of aphasia from focal hæmorrhage. He does not dwell on a mode of paraphasia which is very common in senile dements, but he mentions the occurrence of agraphia, alexia, and paralexia. It appears to the present writer that the very common loss of orientation among the senile, by which they lose recognition of the objects around them, and develop thereby ideas that they are not at home, that they are in strange places, and so forth, may be due really to a condition analogous to, or connected with, pyschical blindness.

On the whole it must be evident that aphasia, using the word in its generic sense, is intimately associated with forms

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of mental disturbance with which we have daily to deal. As we might suppose, looking at the matter from a schematic point of view, and considering the vast importance of those elements of the mental life which are involved, we find in many cases of aphasia very serious engagement of the intellect. A great practical question arises which may at any moment call for the consideration of any man who practises in our speciality, namely the social and legal status of the sufferer from aphasia. *À priori*, and speaking strictly, one inclines to say that there cannot occur any direct injury to a portion of the brain, no matter how small, without producing some lowering of the mental powers. One would expect this degradation to be the greater if the portion of the brain involved were one subserving function, the relations of which to thought are, without question, of the very closest kind. One would, however, also expect that focal lesions involving the seats of function of expression, and being strictly limited, are less destructive to the whole mind than such conditions of the cortex as involve a general disturbance of association. When cases come before us of aphasia, or any allied condition, for a determination of the mental state, our first endeavour should be to find out within what limits the injury to the higher nervous functions is confined, and whether the general intellectual faculties remain comparatively high. In doing so we also are enabled to form an opinion of what the probable seat of the injury to the brain may be, and we learn the condition of the organs of expression. Our interest in the organs of expression in this particular inquiry is especially claimed, because the point at issue is rarely so much the treatment of the mental defect as the capacity of the patient to transact business or to dispose of his property. This capacity may be interfered with by the abolition of the power of expression, even if the supposition were tenable (which we hold is not tenable) that total destruction of expression could occur with maintenance of thinking power.

Each case must be judged separately. There is not, and there probably never will be, a criterion rigidly applicable to all. Two preliminary points are worth mentioning. First, one should not base an opinion on an examination held very soon after the first appearance of the symptoms, else we may be misled by merely temporary phenomena, due, perhaps, to what, for want of a better name, we may call shock. Secondly, in

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any case, except the very plainest, repeated examination is necessary. Not only do many aphasics vary from time to time, but the aphasic is usually very liable to fatigue, and it is only by examination, repeated and not too protracted, that one can be satisfied as to his real condition.

In the majority of all the cases of aphasia which come before us, certain complications, or rather concomitants, greatly increase our difficulty. Thus we have in most cases some degree of right hemiplegia which may prevent our patient being able to communicate with us by writing.

The form of aphasia which interferes least with power of expression, and in which mental integrity is best preserved, that is in which a lesion exists absolutely limited to the motor speech-centre, or, as we should prefer to call it with Bastian, the glosso-kinæsthetic centre (Broca's convolution). At least one such case is recorded by Guido Banti (quoted at some length in Dr. Bastian's book) in which the patient was completely dumb; his mind seemed absolutely clear; he heard and understood; he read; he wrote promptly and correctly. It generally happens that the patient is not completely dumb, but has the power of uttering a few sounds or words which are used indiscriminately, or recur without any particular meaning. In such cases the audito-kinæsthetic commissure is probably interfered with. Though the patient may understand what is said to him, he often uses such words as "yes" or "no" without any apparent appreciation of their meaning. No cases present greater difficulty if one wishes to ascertain the patient's desire (in such a question as the making of a will, the transaction of a business affair, or the like). It is impossible to be certain what is the wish of a man who says "yes" to everything or "yes" and "no" alternately to any question. It may be there are such patients who are able to write and communicate by signs. In the majority of cases, at least, "motor" aphasia is accompanied by more or less agraphia, so that we are brought face to face with a double bar to expression, in the inability to either speak or write.

Nevertheless, if there is not alexia, communication may be possible. Bastian quotes from Broadbent a remarkable case in which there was almost complete motor aphasia, the patient's vocabulary being confined to some half-dozen words, and her writing power *nil*. She conveyed her meaning by pointing

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out things and by various signs. She expressed assent vigorously when those about her had guessed her meaning correctly. She worried over some money which she thought she had lost, and she kept on endeavouring to explain for nearly a year before her friends discovered exactly what she wanted. At the same time she was having her will made. This was gone over bit by bit with wonderful patience and care. She insisted in the end on having everything as she wished it. One would not say that this lady was incapable of making the will to which she gave so much time and thought, and which she could not sign, and yet she showed a mental defect or limitation in one curious way. Broadbent tells us that the fact "that she knew what word she wanted was shown by her resorting to letters and sometimes to a dictionary." If she had resorted intelligently to a dictionary she could have told the story of the money she thought she had lost in a few minutes, instead of waiting and making signs for nearly a year till it was pieced out and guessed by her friends.

Opinion is divided as to how far verbal amnesia is associated with disease of Broca's centre alone. We should expect such a combination, and, as a matter of fact, verbal amnesia is generally found associated with "motor" aphasia. Inability to recall words, with its ordinary accompaniment of paraphasia and with corresponding degrees of agraphia and paragraphia, do not in themselves present insuperable difficulties in communication, because a patient may suffer in this way and yet understand speech and repeat words or even read aloud. Therefore, with care and patience, his general mental state can be ascertained, and if we find that he has fair power of fixing his attention and a sufficiently good memory to assent and dissent respectively to various propositions made to him at intervals, we may allow that he has some capacity for transacting business. If motor aphasia coexists, as is so frequently the case, it may be entirely impossible to say how far the patient is competent.

In word-deafness the patient is usually unable to understand or to repeat words, and can neither write spontaneously nor from dictation. He is, as a rule, either dumb or paraphasic. But varieties of word-deafness are on record in which (Byrom Bramwell) a patient was able to repeat words and sentences which she did not understand, and also write sentences from

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dictation; and (Pick) in which a patient could not understand speech, nor repeat words, nor write from dictation, but spoke perfectly well and wrote spontaneously. In the latter very remarkable case, apparently the most unmixed form of word-deafness recorded, it is especially noted by Pick that "the intelligence of the patient had distinctly suffered; his behaviour was childish; it was difficult to fix his attention for any length of time; besides, he was very lachrymose and emotional. Most of his time he spent in prayer, and when he was thus engaged no kind of noise around him could disturb him," though at other times it was clear that he heard loud noises—as noises—and he used to protest against being shouted at. We note that it is just in cases where only a comparatively limited interference occurs that small defects of intellect are observable; thus if this man had had paraphasia it is not unlikely that the weakness of his intellect would have escaped attention.

Word-blindness is generally accompanied by agraphia. It is very often found that a patient is capable of signing his name correctly, although he cannot write anything else. The real value of such a signature depends upon whether the patient is fully cognisant of the use to which it is being put and approves thereof; in other words, it has no further significance than the cross or mark appended to a document by a person wholly illiterate. "The signature," says Bastian, "is an emblem which may, by reason of its familiarity, be executed by the cheiro-kinæsthetic centre with the smallest amount of prompting; and it would appear that this prompting may come from the common visual centre in cases where the left visual word-centre is destroyed. Similarly a word-blind patient may be able to recognise his own name when he sees it, though apart from this there may be complete alexia." It has been found that cases occur of word-blindness in which the power of writing is preserved, and even of reading aloud words written by the patient to dictation, as in a case recorded by Déjerine, in which, nevertheless, the patient did not understand the words which she saw or which she wrote.

When psychical deafness is associated with word-deafness, or when object-blindness is associated with word-blindness, the conditions of mental degradation are more advanced than when the latter conditions occur alone, and in complete asymbolia the state is one of entire dementia.

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