

THE
JOURNAL OF MENTAL SCIENCE

[Published by Authority of the Medico-Psychological Association
of Great Britain and Ireland.]

No. 264 [NEW SERIES
No. 228.] JANUARY, 1918. VOL. LXIV.

Part I.—Original Articles.

Aphasia in Relation to Mental Disease. Presidential Address by
R. PERCY SMITH, M.D., in the Section of Neurology of the Royal
Society of Medicine, at Meeting held on October 25th, 1917.

My first duty is to express my thanks to the members of the Section for having done me the honour to elect me as its President for the ensuing year, an honour which I felt bound to accept, although it involved the burden of a Presidential Address, in addition to one a year ago to the Section of Psychiatry, of which I am still President. Perhaps the accident that I was for some years the editor of *Brain*, which was at that time the journal of the Neurological Society, in succession to Dr. de Watteville, induced the Section to place me in this chair, to hold which, however, I feel myself unworthy in presence of and in succession to so many distinguished neurologists.

To one whose work has lain for so many years in the domain of psychiatry the choice of a subject for a Presidential Address to this Section has seemed somewhat difficult, but it appeared to me that my best course was to search through my case-books for cases which might be of interest both to the neurologist and the alienist and lie in the borderland between the practices of the two, and as to which either of them may be consulted by the general practitioner. In this way many cases of disease of the nervous system where there has been more or less pronounced mental disorder have come before me.

It has seemed to me that those cases in which there has been aphasia more or less pronounced whether with or without hemiplegia (apart from cases of general paralysis where it has been an occasional symptom), and in which I have been consulted as to the patient's mental condition would be the most likely to be of interest to the Section.

LXIV.

I

The subject of aphasia has, of course, a voluminous literature, both from the side of neurology and of psychiatry, and with regard to this I think we owe an eternal debt of gratitude to Dr. Henry Head, the present editor of *Brain*, and our senior Vice-President, for having in vol. xxxviii of that journal reprinted many of the important papers of our great master, Hughlings Jackson, and so prevented them from passing into obscurity, and for having in his paper, "Hughlings Jackson on Aphasia and Kindred Affections of Speech," given so admirable a summary of the views and conclusions of that great English neurologist. I may also mention the valuable reviews and summaries given by James Collier (*Brain*, 1908, xxxi, p. 523), and by S. A. K. Wilson (*Review of Neurology and Psychiatry*, 1909, vii, p. 151) on the subject.

As recently as 1915 Head writes: "Speech is a function of mental activity and however much that mental activity may ultimately be linked up with the integrity of some portion of the brain substance the problem is primarily a psychological one," and again, "no one but Hughlings Jackson has recognised that all the phenomena are primarily psychical and only in the second place susceptible of physiological or anatomical explanation" (*loc. cit.*, p. 4).

Therefore, no apology is needed for examining those cases of aphasia which come under the notice of the alienist. In any particular case it is important to ascertain whether there has been mental disorder of any kind preceding more definite affection of the speech mechanism, as well as to see in what way cases beginning with aphasia are associated with mental disorder. There frequently arises also in any of these cases the question of business or testamentary capacity.

Although during my tenure of office at Bethlem Hospital a few cases of aphasia associated with certifiable insanity were admitted, in some of which an autopsy was obtainable, the larger number of cases which I have met with in consulting practice have only been seen clinically, and there has been no opportunity of ascertaining how far the affection of speech corresponded with any particular pathological condition of the brain. With regard to this, however, I may again quote Head's remarks in reference to Hughlings Jackson's views: "But no one has assimilated his views on defect of speech and applied them to a series of actual cases of this condition. We failed to appreciate how much closer these conceptions would lead us to the phenomena of aphasia than the glib generalities founded on the anatomical facts of cortical localisation." And again, "Neurology has become frozen stiffly in the grip of pseudo-metaphorical classifications which neither explain the condition nor correspond to the clinical fact" (*loc. cit.*, p. 3).

Hughlings Jackson has said, "We shall do no harm to clinical medicine, if we simply record all the facts" (*Brain*, 1915, xxxviii, p. 37).

I hope, therefore, that the absence of pathological findings in this paper may not render this communication entirely worthless.

The alienist may be called in consultation for the following reasons in cases where there is aphasia :

(1) Because of the confused or incomprehensible speech of the patient and other conduct suggesting confusion or disorder of mind, the nature of the speech affection being misunderstood by his relatives, and not always recognised by the practitioner. This is especially so in those cases where there is no hemiplegia associated with the aphasia, but also occasionally in cases where there has been a previous transient hemiplegia, or even some slight right-sided paralytic signs or unrecognised hemianopia, so that in taking the history one may be confronted by such descriptions as "talks incessantly, uses the same word again and again, shouts at times and shows excitement"; "on waking up was unable to speak, did not know anything, and was mumbling"; "could not find words, was worried and excited, then violent and resistive"; "was light-headed, could not see or read properly"; "makes inarticulate noises"; "talked babble, emotional and angry, but no loss of consciousness"; "talked gibberish, cannot put six words together"; "said to be 'mad' and could not speak properly"; "was brought back home and did not know how to eat, was thought to be intoxicated"; "speech incoherent"; "said to be childish and incompetent and imbecile"; "emotional and confused, unable to read, does not ask for anything or propose anything"; "speech inarticulate"; "found walking about in his office unable to speak, then talked gibberish." Sometimes such patients are found wandering in the street, unable to give any account of themselves, and are regarded at first as being demented. Brissot calls attention to the various speech disorders met with in insanity, which require careful differentiation from true aphasia of organic origin.

(2) Because of definite signs of mental disorder predominating over the aphasic speech troubles. Previous attacks of insanity may have occurred and been recovered from and the attack of aphasia may occur in association with a return of the previous symptoms, or be masked by loss of memory, mental confusion, or apraxia. As Brissot says (*L'aphasie dans ses rapports avec la démence et les vésanies*, Paris, G. Steinheil, 1910): "Many aphasics are met with in asylums whose internment is justified by demential or vesanic troubles." Ideas of persecution (sometimes justified) may be met with, or temporary excitement, delusions and hallucinations, coming on immediately after a "stroke." During my residence at Bethlem Hospital some eleven patients who had either previously been aphasic, or were so at the time of admission, were admitted under certificates, and many such may be met with in the wards of county asylums.

(3) To decide on the proper care and treatment of patients in whom aphasia of various degrees of severity is associated with disorder of mind and conduct. Many of these, of course, can be treated at home, if the means and accommodation allow of proper nursing and supervision, but, as Savage has often said, "the treatment of insanity frequently depends on the length of the purse," and the infirmary wards of county asylums afford better care in such cases in the poorer classes than can be met with in any but the best of the workhouse infirmaries.

(4) To assist in forming a prognosis as to mental recovery or otherwise, or in the diagnosis from other organic conditions, such as general paralysis.

(5) To give an opinion as to the business or testamentary capacity of a patient suffering from aphasia, or occasionally to assist in the solution of the question of responsibility of an aphasic in criminal cases.

(6) Occasionally it has happened to me to be consulted by a patient with manifest aphasia, about his or her own mental condition, as to why there was difficulty in writing letters, and in getting "command of words," and what was the outlook for the future.

In all some forty-five cases of varying degrees of severity of aphasia and mental disorder have come under my notice in the last thirty years.

Dejerine (*Sémiologie des affections du système nerveux*, 1914) points out that the degree of change of intelligence in cases of aphasia depends on (1) the extent and intensity of the lesion, (2) its reaction on neighbouring regions, (3) on the state of the vessels, (4) on the condition of the circulation and kidneys, (5) especially on the age of the patient, and says: "Il ne faut pas oublier qu'un aphasique peut devenir dément, de même qu'un dément peut devenir aphasique."

It will be well to give statistical particulars of my cases as to the age of the patient, the condition of the heart, vessels, and kidneys, the presence or absence of definite hemiplegia, and also as to heredity, previous attacks of insanity, and history of syphilis or alcohol.

(1) *Age*.—The average age of the male patients was 57·6. But, excluding syphilitic cases, four of whom were under 40 years of age, the average age was 62. The average age in the cases with a history of syphilis was 47, showing the much more detrimental effect of this poison on the arterial supply of the brain than mere senile or presenile degenerative changes. The average age in women was 62, and there were no syphilitic cases. In each sex the average age was somewhat higher in those cases seen in consultation than in those found at Bethlem Hospital.

(2) Definite heart disease, either valvular or degenerative, was found in 26 *per cent.* of the men and 22 *per cent.* of the women.

(3) Renal disease was found in 26 *per cent.* of the men and 11 *per cent.* of the women, and there was glycosuria in one of each sex.

(4) Arteriosclerosis was found in 29.6 *per cent.* of the men and nearly 17 *per cent.* of the women.

(5) A history of alcoholism was found in 26 *per cent.* of the men and nearly 17 *per cent.* of the women. In many cases several of these factors were combined.

(6) Definite hemiplegia more or less pronounced was found in nineteen out of twenty-seven cases in men. In all but one of these cases the hemiplegia was on the right side at the time of observation, and in that one case the patient, who was syphilitic and was under care in Bethlem Hospital for acute mental excitement, suffered from seizures, with left hemiplegia and anæsthesia ending in coma and death. There was, however, a history of a former attack of right hemiplegia and aphasia which had ended in recovery. *Post-mortem* there was found obliteration of the right middle cerebral artery by syphilitic arteritis with recent softening of the area supplied by it, and also old syphilitic arteritis of the left middle cerebral with an old cavity in the left internal capsule accounting for the former attack. Ten women out of eighteen had right hemiplegia either early or late in the case, and one of them had had a previous attack of left hemiplegia. In no case was left hemiplegia immediately associated with aphasia.

(7) A family history of insanity, neuroses, or alcoholism was found in 33 *per cent.* of the men and 39 *per cent.* of the women. In one case the patient's brother and sister had both died of right hemiplegia with aphasia.

(8) Previous attacks of insanity which had passed off had been present in three cases, but in many mental disorder or failure was present for some time before the onset of definite aphasia.

The cases which have come under my notice seem to me to be divisible mainly into four groups, *viz.* :

(1) Those in which dementia, or mental disorder or failure sometimes amounting to certifiable insanity, preceded the more definite and classical affection of speech designated as aphasia.

(2) Those in which considerable mental failure was concurrent with or subsequent to an attack of aphasia. In severe and fatal cases the extreme mental dissolution of coma is seen.

(3) A third group in which, although there is severe affection of speech, the patient possesses such a degree of mental capacity as to permit of business or testamentary capacity.

(4) Cases in which there is some slight hampering of speech with very little mental disorder, although some may be present.

With regard to the *first* group it will be manifest that a patient who

has already become disordered in mind is likely to have his mental capacity further deteriorated by the additional weight of an attack of aphasia, though this result does not always follow.

Hughlings Jackson has well said: "To speak is not simply to utter words, it is to propositionise"; "the unit of speech is a proposition." And again: "Loss of speech is, therefore, the loss of power to propositionise. It is not only loss of power to propositionise aloud (to talk), but to propositionise either internally or externally, and it may exist when the patient remains able to utter some few words" (*Brain*, 1915, xxxviii, pp. 113, 114).

If, therefore, his mind has first failed and his ideas and propositions have become morbid ones or there has been such defect of memory that recent events are not recorded and the patient lives in the past, as in many senile cases, it will be evident that as he has been "lame in his thinking" before the occurrence of definite aphasia, the lameness of thought will tend to be worse afterwards. The addition of "inferior speech" and "inferior comprehension" makes the ruin more complete.

To quote Head (*Brain*, 1915, xxxviii, p. 23): "Suppose, however, 'imperception' is added to the defect of speech, the formation of images, arbitrary symbols and those unconscious processes which precede their development will be disturbed. The 'general intelligence' will then appear to suffer greatly; for the mind will be struck, not only on its emissory, but also on its receptive side."

In this first group "imperception" has in many cases preceded the defect of speech, and the "general intelligence" has already suffered.

I have already pointed out that, excluding syphilitic cases, the average age of patients has reached the seventh decade of life, and that cardiac, arterial, or renal changes are frequent, therefore it may be safely assumed that there is commonly in these cases some degenerative change in the cortex or other tissues of the brain with deficient blood supply, the occurrence of aphasia marking a more definite pathological change in some part of the speech areas of the cortex. This complication naturally increases the gravity of the prognosis so far as life is concerned, and such cases frequently die of cerebral hæmorrhage or softening.

A few selected cases are given:

(a) Mrs. R—, widow, æt. 60, seen May 25th, 1908. No heredity, no history of alcohol. For several years memory had progressively failed so that it was said to have become blank. Two months before I saw her she had had seizures with loss of consciousness and stertorous breathing, after which she appeared not to recognise her children and lost control over the bladder. She was said to be "incoherent and not able to put six words together." When I saw her she had no hemiplegia, she could not express herself, constantly using wrong words in

trying to answer questions. She could not name objects, and could not tell the time by a watch. She was word-blind, and could not read even her own name, or do what was written, and could not write. She was not, however, word-deaf, but did simple things she was told to do, and repeated words she heard. She was certainly deficient both in internal and external speech and very "lame in thinking."

(b) Mrs. L—, a widow, æt. 78, first seen in August, 1902. Father insane, sister had senile dementia, brother insane, two cousins insane. For some years there had been failure of recent memory; for one year delusions, followed by excitement and confusion, with delusions of poisoning and of her son being arrested. She mistook the identity of people; for instance, mistook her daughter for her own sister, spoke of her husband, who had long been dead, as being alive, then gradually became more childish and demented, and lost control over the bladder. In 1905 she had a seizure, followed by right hemiplegia and loss of speech. She was unable to frame words, but understood such simple orders as to put her tongue out. On one occasion, however, an "occasional utterance" took place under emotional stress. An enema was being given with some difficulty, and a nurse told her not to worry, when she suddenly said: "I will worry." Apart from this, there was absence of external speech, and no test for reading or writing could be made in consequence of the profound dementia. Death followed very shortly.

(c) P,— æt. 63, an accountant, who had been pensioned five years before, in consequence of failing memory and confusion of ideas, by the railway company in whose employment he had been. There was a doubtful history of alcohol and his arteries were thickened. For nearly a year he had become much worse mentally, and was disorientated as to time and locality, did not recognise his own house, had forgotten his age, talked chiefly of his boyhood, thought he was still employed by the railway company, had been threatening violence to his wife and others, was dirty in habits, and apraxic in dressing. On examination, he was found to have slight paralysis of the right side of the face, but no other paralysis. He could talk in a hesitating way, but could not give the name of the town or road in which he lived, could not give his son's name, could not name objects—*e.g.*, "glove," "watch," or "pen"—but recognised the names when spoken; he could not write his name correctly and had not written a letter for some months. He could not say what was the use of a pen, but when asked what I was doing said "writing." He could read print, but did not understand what he had read.

The association of apraxia in dressing and writing with some aphasia, but without hemiplegia, is interesting, and will be referred to later.

(d) Mrs. B—, æt. 48, no heredity, had lived in the Tropics, and had suffered from malaria and dengue fever. There was a history of frequent "whisky and soda," and she acknowledged a craving for it. For some months she had become irritable, she had ceased to write letters, found everything an effort, was said to be talkative and muddled and to forget where she had put things, recent memory had failed, and she never knew the date or day of the week. She was advised to return to England, and on the voyage was alarmed by an impending attack by

torpedo. When seen on July 27th, 1917, her recent memory was found to be bad, but remote memory good, she could not name the month or day. She recognised her failure of memory and craving for alcohol, sleep was defective, and she dreamed of standing by the boats when the torpedo attack was impending. Heart, lungs, and urine were normal, knee-jerks were found to be absent without any other signs of tabes, and there was some tenderness of the muscles of the legs. Catamenia were irregular (impending climacteric). Speech was then normal. She appeared to be a case of alcoholism with some failure of memory and alcoholic neuritis. She had never had a fit. She was advised against alcohol and against returning to the Tropics, which she had a great desire to do when her husband went back in the autumn. Four days afterwards, July 31st, she had a seizure in which she was generally convulsed, bit her tongue badly, passed water and motion, and was unconscious. When seen again on August 2nd, in consultation with Dr. Friend, she had recovered consciousness, and had no paralysis on either side of the face. Extensor plantar response was found on both sides, but knee-jerks were still absent. There was no ocular paralysis, pupils reacted normally, and optic discs were normal. She was, however, aphasic. She talked a great deal, but her conversation was generally quite irrelevant, and she could not ask for anything or give any account of her symptoms. When asked where she had seen me she said, "I am getting nearer, I shall get old and die nearer, and will die in the streets (? Straits), I am getting old, I am getting in the streets soon, I will have to 47, will die in the streets, I am getting tired and cross and nearer 80, soon nearer 97." Then again she said, "Somebody said, never soon die in the streets one day nearer 85 soon." When asked to do so she at once put out her tongue, and it was protruded straight, but was badly bitten on the right side. After being asked several times, "Which is Dr. Smith?" she pointed and said, "It is you." Then she went back at once to her recurring utterances about dying soon. When asked if her tongue was sore she kept rubbing it on the right side, and after being asked several times "Is it sore?" said distinctly "Yes." When asked if she had slept the night before, she said, "Oh yesterday will soon die on Saturday"; then again, "I am getting old and cross and stout nearer 50," "it was on Sunday morning will soon die all nearer 80." When asked if she had headache, she did not answer for a long time, and then said "No." Her answers "Yes" and "No" apparently had propositional value. She could not give the address of the house, kept on saying "nearer 86." She could not read or recognise letters, could not name objects—*e.g.*, watch, knife, etc.—but laughed at the suggestion that these objects were a toothbrush or pencil. She recognised the word "watch" when correctly applied, but could not tell the time. She could not name or count fingers. She could not write. She got out of bed when told to do so for testing knee-jerks and gait, but was rather slow in understanding what was wanted, and all the time kept on with the recurring utterance. She seemed to be word-blind but not word-deaf. Examination of the blood showed a negative Wassermann reaction. On August 23rd the aphasia had passed off with the exception of some difficulty in remembering names; she had a very indistinct memory of the attack or of seeing me

and Dr. Friend ; her memory for dates was still very bad, but she had written a letter and could read. The attack having passed off so quickly, there was no apparent increase of mental failure, but she was evidently in need of nursing supervision. It is very likely, as Hughlings Jackson suggested, that the recurrent utterances referred, however imperfectly, to what she had been thinking or discussing about her case immediately before she had the seizure.

The *second* group of cases—*viz.*, those in which considerable mental failure is concurrent with or consequent on an attack of aphasia—contains many examples of the different ways in which aphasia may manifest itself, and here I make no claim as it were to “pigeon-hole” the cases according to the various speech-centres which have been described in works on aphasia. As Collier says (“Recent Work on Aphasia,” *Brain*, 1908, xxxi, p. 539): “Recorded cases show every degree both of severity and permanence, and they give no means of clinical distinction between cases claimed as examples of Broca’s aphasia and of Wernicke’s aphasia respectively.”

The following are some examples from my case-books :

(a) Mrs. S—, æt. 67, widow, seen November 27th, 1902. Sister and daughter had been insane. Her urine contained albumen and some sugar. On November 23rd she complained of headache, and the next day “could not find words,” was worried and excited and repeated the word “come,” possibly a recurring utterance due to a feeling of need for help when the attack began. She became violent and resistive, especially after visits by relatives, who considered that she must have “something on her mind” to account for her conduct. When seen she had no hemiplegia. She took a long time to understand what was said, but did simple things such as putting out her tongue when asked. She used words in a wrong sense, saying “upstairs” instead of “downstairs.” Speaking of herself she said “she is very bad.” Some of her utterances had a propositional value, for instance she said to the doctor, “I don’t want you ; go away.” She had other ejaculatory utterances such as, “Albert wants to get to get,” and “I don’t want it,” which were incomprehensible to others. She could not find the word “key” when she wanted to open a box, but called it “linen,” then took out some securities, but could not explain what she wanted to do with them. She could not read or write. She remained mentally enfeebled and unfit to manage herself or her affairs, and died four years later without any definite hemiplegia.

(b) Mrs. D—, æt. 73, widow, seen November 23rd, 1904. Six years before she was said to be deaf, possibly there was some word-deafness at first, but there was no deafness when I saw her. She had begun to miscall objects and gradually lost speech, being able only to make inarticulate noises. Her friends had to stop her from going to church on account of these noises. There was no definite seizure or hemiplegia at the outset. She refused to spend money, and was said to have the delusion of poverty. She became unable to care for herself, and needed constant supervision. When I saw her she could not

speak at all and did not try to, but occasionally made an inarticulate noise. She understood what was said, and at once got her daughter's photograph when her name was mentioned. She could read what was written, and did what she was in this way instructed to do. She could write, but expressed herself wrongly, though the sense of it could be made out; for instance, she had written to her nurse, "I will wash her hair," meaning her own. In answer to my questions as to how she occupied herself and what her age was she wrote, "I am read papers, you are 73." She wrote firmly and quickly in answer to written questions, but always using wrong expressions or pronouns. The proper names of relatives were given correctly. She had no paralysis. The chief defect seemed to be in the motor, or emissory side, as there was no word-deafness or word-blindness. She gradually failed, and died the next year, but no autopsy was made.

There was no doubt in this case of the presence of "internal speech," as shown by her ability to express her thoughts in writing, although there was some defect in this.

(c) S—, æt. 58, widower, seen May 31st, 1911. Father died of apoplexy, mother of cancer. He had an enlarged and irregularly acting heart. Eighteen months before he had suffered suddenly from loss of speech while staying in an hotel, and since then had lost business capacity, so that his business failed, and had to be wound up. There was no hemiplegia. He had no energy, had lost control over his bladder, was apraxic in dressing and feeding himself, and speech was said to be "incoherent." On examination he was very conscious of his speech defect, recognised that he made mistakes in words, and had lost bladder control, and wept about it. He could understand everything said, but answered confusedly, could not always name objects, but knew their uses, for example called a watch "timepiece." After naming "penknife" there was marked perseveration of idea, all subsequent objects shown being called "penknife." In attempting to write he was quite unable to finish words.

This was again a case in which aphasia, apraxia, and agraphia were associated, without hemiplegia.

(d) B—, æt. 83, married twice, had eleven children, had been a hard-headed business man, and was described as a *bon viveur*, and always full of energy. Until five years before he had ridden regularly, but then broke his leg, and ceased to take active exercise. Two years before he had had pneumonia, and since then he had shown signs of cardiac degeneration. For one year he had begun to lose words and to lose his memory. His speech became progressively worse, he was emotional and violent if opposed. He was disorientated in time and place, would get up in the middle of the night and mistake time, would insist on going to the City, but did nothing when there, and on returning could not always recognise his house. He lost control in cleanliness. When first seen on July 12th, 1917, he could slowly understand what to do when told—*e. g.*, to put out his tongue, put his hand on his head, get out of bed and walk round the room. He imitated movements. He tried to talk, but his speech was generally incomprehensible. He could not name a watch or other things, could not tell the time, could not give his address or the name of the road, but recognised names of

objects when repeated to him. It was interesting that although he had lived seventy-four years in this country he could not make sentences in English. He gave his first name in German, and made some attempt to answer in German. For instance, when asked if he knew me he said, "nie gesehen." He could say "Yes" in answer to some questions, but it was often irrelevant and of no propositional value. With regard to his attempt to answer in German, I subsequently learned from his son that the first nine years of his life had been spent in Germany. He was apraxic in various ways, especially in fastening his clothes, and when an attempt was made to get him to write, he did not seem to know the use of the pencil, holding it upside down or letting it drop. He could not write and could not read. He was undoubtedly word-blind, but not word-deaf. There was no hemiplegia, his tongue was not well protruded, but there were no other bulbar symptoms. A fortnight later he was more confused and silly, did not seem to understand so much, was vacant, and had been noisy and violent at times; he was also more apraxic. He said much less, but still tried to use German, and when asked if it was a cold day (it was really very hot) said "ein Bischen." On August 3rd he made inarticulate noises, did not try to speak, was drowsy and confused, failed to recognise people, had no control over emunctories, and had pulmonary congestion with rise of temperature. There was still no definite paralysis. He died in a few days.

It will be noted that in this case also there was apraxia and agraphia with no definite hemiplegia.

(e) Mrs. M—, æt. 81, widow, seen October 3rd, 1904. There was a history of chronic arthritis, of phlebitis ten years before, and of a "threatening of a fit" at the same time. As a child she had lived in Italy, and then habitually talked Italian and French more than English. Since marriage, at the age of seventeen, she had lived in England. On August 5th, 1904, she had an attack or seizure in which she was said not to have lost consciousness but to have "talked babble," and was emotional and angry. When seen she appeared to understand what was said, but screamed when others did not understand her, she talked volubly, but could not frame intelligible sentences which contained many adjectives but no nouns. It was interesting that she spoke Italian and French but no English at this time, the law of dissolution holding good as in the previous case. She could not name objects in any language, but recognised wrong names. She was completely word-blind, could not read or do what was written, and could not write spontaneously or copy. There was at first no hemiplegia, but later weakness of the right side with deviation of the head and eyes and inability to stand developed. Some improvement followed for a time, in which she became more intelligible, and her English returned. Eventually she died.

(f) B—, æt. 56, widower, a German who had long been resident in this country, seen December 12th, 1914. There was a history of syphilis thirty-five years before. In November, 1913, he had had slight right hemiplegia with "some difficulty in words," which had passed off. His urine was albuminous, and he had hypertrophy of the left ventricle. One week before I saw him he had become dizzy, com-

plained of weakness of the legs, and would have fallen if not prevented; seemed unable to read, and was confused and emotional. The day before I saw him he was unable to sign his will, which had been drawn up and to which he had given his approval. On examination he had no paralysis, but some defect in localising sensation. He was apraxic in that he could not feed himself, although there was no paralysis, and on being given a pen held it with the nib reversed. He did not ask for anything or propose anything. He could answer questions slowly, but could not volunteer information about himself or talk spontaneously. He was not word-deaf and did what he was told. He could not name objects, but recognised the correct name. He could not even give the names in German, his native language, with the exception of a watch, which he called "Uhr." He could not tell the time by it, could not give his address, or name the locality in which he lived, or give the month. He seemed to be word-blind, or nearly so, could not read except one or two isolated words, and could not name the letters in words pointed out to him. He was quite unfit to exercise testamentary capacity or to transact business. He died shortly afterwards.

(g) The last case of this group which I shall narrate was H—, æt. 62, married. There was a history of excess in alcohol and sexual irregularity. I saw him on October 12th, 1916. In the previous May he had had a seizure without resulting paralysis, but following which he was unable to read for some days. Three weeks ago he had had another attack, in which he could not speak for one whole night, and could not write or read, and had slight loss of power in the right arm and right side of the mouth. He then recovered speech, but became very depressed and worried, accused himself of moral lapses, especially of sodomy with women, and dreaded prosecution for this, although none was pending, and he could not remember the circumstances. He was completely obsessed by this dread, and had spoken of suicide. On examination he was found to have a systolic mitral murmur and auricular fibrillation. The hemiplegia had passed off. He talked connectedly and answered questions, did not seem depressed, and said he had exaggerated the idea of prosecution, and was not troubled about it any more. He could not give the name of pencil, chain, matchbox, etc., but after giving the name to a watch, he showed perseveration by afterwards calling everything a watch. He could repeat names of objects when told, and recognised their correctness. He could not tell the time or name coins or give their value. He was word-blind and totally unable to read. He could not write even his name spontaneously, but could just copy it. He was quite unable to transact business. His condition was at first masked by his ability to talk. It was quite evident that he could "propositionise," but he had evidently had insane propositions, and this, together with the manifest organic disorder of at least the visual speech area, led to the advice that he should be sent away from home for care and treatment. While arrangements were being made for this he eluded his relations, although they had been warned, went out and bought a gun-licence and a revolver, and shot himself.

It is difficult to say whether this result was determined by the morbid dreads which he had shown or by the difficulty in which he

found himself by his inability to write or read; no doubt both factors acted. Evidently he had sufficient speech, both internal and external, to enable him to come to a decision and carry out his desire.

I have called attention to cases in which apraxia, agraphia, and aphasia were associated. I may say that of eight cases which have come before me in which apraxia in various forms was noted all were also agraphic, but none of them had definite right hemiplegia. In nearly all of them the aphasia was chiefly of the motor type.

S. A. K. Wilson, in a comprehensive study of apraxia (*Brain*, 1908, xxxi, p. 164), calls attention to the reason for believing that there is a centre in the first and second convolution of the left side where movements are combined ideationally analogous to the centre for the co-ordination of movements requisite for speech in Broca's area, and points out that in motor aphasia we have a form of apraxia, and that agraphia is a variety of apraxia, which may be either of sensory or motor origin, and that there may be agraphia without any paralysis. J. S. Collier (*Brain*, 1908, xxxi, p. 529) also refers to the evidence pointing to a lesion of the first and second frontal convolutions of the left side in cases of apraxia, and says "the bearing of this evidence upon the localisation of a motor speech centre in the left third frontal convolution is obvious and striking, for motor aphasia bears the same relation to movements of the muscles concerned in speech as does apraxia to the movements of the limbs."

We now come to the *third* group, in which, in spite of severe affection of speech, the patient possesses internal language and such a degree of mental capacity as to permit of business or testamentary capacity. I shall refer to three cases of this nature.

(a) M—, single, æt. 64, seen May 31st, 1912. There was a history of syphilis twenty-five years before, and he had lived a great deal in South America, where Spanish was his usual language. In August, 1909, he had a seizure, followed by right hemiplegia and loss of speech except for one or two Spanish words. Between July and December, 1910, he had six fits, and two others up to May, 1912. He was considered by a relative to whom he was unfriendly to be childish and incompetent, but he had always been found by his solicitor to be alive to what he thought right for himself. He had exercised volition in signing an authority to his solicitor, and had made a will twelve months before. On examination he was found to have right hemiplegia with wasting and contracture of the right arm. His right leg was weak, and he walked stiffly. His right knee-jerk was exaggerated. He was unable to speak spontaneously, but could say "Yes" and "No" correctly in answer to questions, and they certainly had propositional value. He could not say his own name, he could not give the names of places he had lived in, but recognised the name of a South American town, saying "Yes, yes." He could not always name objects seen, but could repeat the word when it was said, and afterwards there was perseveration of the

idea when a fresh object was shown. He could not name coins, but knew if a wrong name was given. He could say the names of his solicitor and two relatives. His expression was that of intelligence, his hearing and sight were good, he was able to do what he was told, and could pick out objects of which he heard the names. He could not read aloud, but recognised one or two words and repeated them. He appeared to read to himself and could answer correctly "Yes" and "No" as to what it was about. His right arm being completely paralysed he could not write with it. He was, however, able to sign his name slowly with the left hand and had signed an authority in this way to his solicitor to receive money and make disbursements for him. He could copy from print to writing with his left hand, and could write slowly from dictation. In consequence of the laboriousness of writing with his left hand he did not write letters. He showed by gestures and by saying "No, no," that he had antipathy to the relation who thought he was an imbecile. He knew perfectly well whom he wanted to manage his affairs. He could answer as to his income by exclusion when wrong amounts were suggested to him. He was quite happy in a nursing home.

In this case there was no word-blindness or word-deafness, and it seems a fair presumption that this was one of the cases in which Broca's region was chiefly affected as far as speech was concerned, and the history of seizures suggests cortical damage. Internal speech seemed to be unaffected. There was no difficulty in reporting that he was able to understand and execute a legal document, which was the question at issue.

(*b*) D—, æt. 83, widower, seen March 13th, 1917. He had lived abroad for many years and most of his immediate relatives being well provided for he had made a will in December, 1915, leaving various legacies to friends and a nurse who had attended him through a severe illness five years previously and one to a nephew. On May 15th, 1916, he had an attack of right hemiplegia with aphasia. He was speechless except for occasional ejaculatory words. He could not read aloud or understand written language, he could write his name automatically, but could not copy it, and could write nothing else. He was certainly "word-blind." He was not, however, "word-deaf," but could understand what was said and do what he was told. He could by gesture express agreement with or dissent from leading questions. On July 7th, 1916, he had another attack depriving him entirely of speech. His mind was said to be much more confused but not blank. Some months later he appears to have made some improvement in intelligence although he remained speechless, and was said to show dislike to the will he had made and appeared to want to improve the position under it of the relative who had shown much attention to him in his illness. Although he could not speak he went through the gesture of striking out the name of an old friend to whom he had left money, and he seemed agitated and emotional. He was unable to give instructions either orally or by writing to his solicitor, and neither the latter nor another physician considered him at that time to be in possession of testamentary capacity. Further improvement in his condition took place and he frequently conveyed the impression of dislike to his will as it stood and was often looking at it. When seen on March 14th, 1917, he was still

suffering from defect of speech, but the hemiplegia had to a great extent passed off. He could answer questions in monosyllables, but frequently used wrong words in trying to speak. He often took hold of his tongue, as if he felt it would not work properly and knew he was using wrong words. His answers "Yes" and "No" were to the point, and had propositional value, and his memory appeared to be good when interrogated about his past life and occupation, the names of his relatives, and the extent of his property. He gave assent readily and emphatically to the question as to whether he wished to alter his will. He occasionally said a short sentence, and gave the names of relations. He definitely expressed affection or dislike for individuals, and was found to have knowledge of those whom he would naturally benefit and of the reasons for doing so. All this was elicited by a long series of questions, and by propounding to him suggestions to which he was able by gesture and emphasis and by the tone of his answers to give reasonable assent or dissent. His expression was that of a man alert and appreciative of the position. He was unable to read aloud, but was able to read to himself and showed by answers that he appreciated what he read. He could not write his name but made attempts to do so. On this occasion he was neither word-deaf nor word-blind, the chief defect appearing to be a motor one both in speaking and writing. A full report was made as to his condition, and the opinion given that he now appeared to have testamentary capacity. At a subsequent interview with his solicitor and another physician it was possible to take instructions from him and a fresh will was executed.

(c) Miss R—, æt. 60, seen April 12th, 1913. Brother and sister both had right hemiplegia and aphasia. Both ovaries had been removed some years before, and she had also had the operation of "short circuiting" in consequence of intestinal trouble. After this a drug habit had begun, dating from the use of morphia to relieve pain. In the autumn of 1912 she had had a short attack of mania from which she had recovered. A short time before I saw her she had had an attack of what was supposed to be influenza, followed by right hemiplegia and hemianæsthesia. For three days she could not talk clearly and for ten days she could not sign her name. She had recovered writing to some extent but complained that she could not "make the pen spell." In talking she missed words and used wrong words, could not name objects, but knew their uses. She complained of losing her brain, and said she had better be locked up. She knew who were her relations and the extent of her means and whom she wished to benefit, and had no delusions. She was anxious to know if she was fit to make her will, and after a full consideration of her condition the opinion was given that she had testamentary capacity.

In these testamentary cases the same general rules apply as in cases where there is no aphasia—namely, that the testator "shall understand the nature of the act and its effects; shall understand the extent of the property of which he is disposing; shall be able to comprehend and appreciate the claims to which he ought to give effect; and, with a view to the latter object, that no disorder of the mind shall poison his

affections, pervert his sense of right, or prevent the exercise of his natural faculties, that no insane delusions shall influence his will in disposing of his property, and bring about a disposal of it, which, if the mind had been sound should not have been made."

In cases such as I have mentioned the extreme importance of long unhurried interviews need not be emphasised. Moreover, there is the more need in such cases for an accurate record of the questions put to the patient and his answers, whether in faulty speech or writing, or associated with gestures and emotional emphasis. The use of shorthand in this respect is very great.

Sir William Gairdner, in opening a discussion on "Aphasia in Relation to Testamentary Capacity" (British Medical Association, Annual Meeting, Edinburgh, 1898; *British Medical Journal*, 1898, ii, p. 581), laid stress on the point that "The fact of aphasia (unless it be very limited in extent) interferes either with the graphic and visual speech processes or with the auditory and vocal speech processes, and therefore throws the *onus probandi* upon those who consider the will genuine or wish to prove the will genuine."

Hughlings Jackson has well said: "Such a question as 'Can an aphasic make a will?' cannot be answered any more than the question, 'Will a piece of string reach across the room?' can be answered. The question should be: 'Can this or that aphasic person make a will?'" (*Brain*, 1915, xxxviii, p. 115).

In other words every case must be considered on its merits after the most careful examination.

I shall not give any details of very slight cases, or of those cases which have come under my notice where a severe vascular lesion causes right hemiplegia and aphasia, ending quickly in death.

It will be well to consider how far these cases correspond with Hughlings Jackson's views on aphasia. I may take it that his great principle that dissolution occurs first in the most highly organised products of neural or mental activity, leaving the more lowly at liberty to express themselves freely in the resulting symptoms, is beyond dispute. Positive and negative symptoms are seen both in the mental state and in the condition of speech, but the preponderance of senile cases accounts for the fact that the negative side is the more conspicuous, as shown by the frequent occurrence of loss of memory and perception, of judgment and control.

The return to an early acquired language and the loss of a more recent one in attempting to speak has been exemplified in some of the cases narrated.

Hughlings Jackson divided cases of aphasia into two classes:

(1) Severe cases in which the patient is speechless or nearly so, or in which speech is very much damaged, and

(2) Cases in which there are plentiful movements but wrong movements, or plenty of words but mistakes in words.

These groups have been exemplified in various degrees in my cases, as have also his differentiation of speech into superior and inferior, internal and external, his description of recurring utterances and occasional utterances, and his insistence as to the use of the words "Yes" and "No" as being in some cases of propositional value, though often otherwise.

With regard to recurring utterances, I may refer to Jackson's view (*Brain*, 1915, xxxvii, p. 158) that the lesion in the left half of the brain "is not the cause of the recurring utterance," and that if the patient had not been "taken ill" he would not have had such a recurring utterance as "he would have been able *not to utter it*" (italics in original).

Again, he says (p. 174): "A patient who recovers soon from aphasia loses his recurring utterance, becomes able not to utter it." In other words the higher centre has regained control and prevented the over action of lower centres. It appears to me that the case of one lady mentioned above is a good illustration of this.

Hughlings Jackson held that speech was a part of mind and that we must get rid of the feeling that there was abrupt and constant separation into mind and speech. At the same time he pointed out clearly the fact that in some cases there may be great affection of external speech and yet little affection of mind, as shown by the evidences of internal speech especially in writing. In one of the cases I have narrated the patient having practically no external speech was also unable to write with his right hand and very little with his left, yet there was no doubt that he had considerable mental capacity. On the other hand, a patient who had a considerable amount of external speech, but who had lost writing, was so disordered in mind that he had delusions and committed suicide.

I have shown that aphasia may supervene on pre-existing insanity or mental decay, no doubt due to vascular or degenerative changes, which might have led to the same result in the absence of the mental disorder, and that, on the other hand, aphasia may be the first symptom indicative of cerebral and mental decay. In such cases the question arises how far the mental disorder is intimately associated with the aphasic disturbance of speech or is due to widespread vascular and nutritive changes in the brain. The mental disorder does not necessarily amount to certifiable insanity, but may in varying degrees affect such mental processes as perception, memory, emotion, and volition, without much disorder of conduct. It appears to me that in all my cases, except those which may be looked upon as examples of Broca's aphasia, there has been some disorder of mind, though not always

marked failure of intelligence. In a review of the question of aphasia (*Review of Neurology and Psychiatry*, 1909, vii, p. 151) S. A. K. Wilson says: "Speech is but a specialised part of the intellect. And, therefore, there can be no disturbance of the function of speech, however slight, in which there is not a disturbance of certain psychical states." He, however, combats Marie's view "that in cases of aphasia (*i. e.*, in Marie's sense) defect of intelligence only occurs and always occurs in lesions behind an imaginary line drawn from the posterior end of the island of Reil transversely to the lateral ventricle." I cannot believe that the disorder of mind in such cases as I have observed is only associated with a lesion of a single centre of intellect specialised for language, but believe that, on the contrary, it is associated with widespread vascular and nutritive changes in the brain, such as are commonly found in senile or syphilitic cases.

Once more to quote Hughlings Jackson (*Brain, loc. cit.*; p. 167): "We must bear in mind that 'will,' 'memory,' and 'emotion' are only the names men have invented for different aspects of the ever present and yet always changing latest and highest mental states which in their totality constitute what we call consciousness."

In conclusion, I may say that my observation of those cases of aphasia which have come under my notice leads me to agree completely with the views expressed by Henry Head in the Summary at the end of his paper, to which I have already referred.

Further Observations on Experimental Toxi-Infection of the Central Nervous System (1). By DAVID ORR, M.D., and Major ROWS, R.A.M.C.

This communication is a continuation of our experimental work on the action of bacterial poisons upon the nervous system.

In 1914 (2), after several series of experiments, we drew attention to the differences between lymphogenous and hæmatogenous infection. The first was induced by infecting the ascending lymph stream of nerves; the second by placing celloidin capsules containing a culture of bacteria in the abdominal cavity. Lymphogenous infection was found to be characterised by:

- (1) Reaction of the cells of the fixed tissues.
- (2) Proliferation of the cells of the adventitial sheath of veins and capillaries.
- (3) The appearance of scavenger cells to remove disintegrated myelin.
- (4) Nerve-cell degeneration and neuronophage phenomena.