

suspicion of laryngitis or oedema of the larynx or there is narrowing of the air way beyond the mouth it is contra-indicated.

Birmingham.

A CASE OF MOTOR APHASIA WITHOUT AGRAPHIA.

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THE great point of interest in the following case is the fact that there was complete motor aphasia without any agraphia; any defect in writing which was present in the early stages of the case was clearly a mere defect of manipulation, a defect due to inability to hold the pencil and not an aphasic defect properly so-called. The aphasia was purely motor. For a fortnight after the occurrence of the lesion the patient did not utter any spoken word, although she tried to do so. It was only after she was taught to repeat vocal sounds, vowel sounds (on Feb. 1st and 2nd), that she began to speak at all, and it was not for several days after this that she was able to repeat the most elementary speech sounds (vowels and letters). On Feb. 3rd, when she could only repeat some of the letters of the alphabet, she wrote me a well-written letter. I know of no case in which such complete motor-vocal aphasia was associated with such perfect writing ability. It is by some authorities supposed that the nervous impulses concerned in the production of written speech pass through the motor-vocal speech centre (Broca's centre) in order to reach the graphic or writing speech centre. I have for years past argued against this view and taught that under ordinary (normal) circumstances the nervous impulses for written speech pass from the visual speech centre to the graphic speech centre directly and not through the motor-vocal speech centre. If in this case the motor aphasia was due to a lesion of Broca's convolution (the motor-vocal speech centre), this view would, of course, be absolutely proved, so far at least as this individual case is concerned. But the question arises whether the motor aphasia depended in this case upon a lesion of the motor-vocal speech centre (Broca's centre) or upon a lesion of the conducting fibres which pass from the motor-vocal speech centre to the internal capsule—in short, whether the lesion was central (cortical) or subcentral (subcortical). In the absence of post-mortem examination it is, of course, impossible to say. The facts that even when the motor aphasia was complete the patient could correctly indicate the number of syllables in a word pronounced in her hearing and that there was absolutely no other aphasic defect except the motor aphasia are in favour of a subcentral (subcortical) lesion. It is easier, too, to suppose the association of such marked motor-vocal aphasia with no agraphia as the result of a subcortical than of a cortical lesion. On the other hand, I know of no case in which such complete and persistent motor aphasia was the result of a subcortical lesion; such marked and persisting motor-vocal aphasia is, in my experience, suggestive of a central (cortical) lesion, of destruction of the motor-vocal speech centre. But whatever may have been the position of the lesion, whether involving the motor speech centre itself or the fibres passing from the motor speech centre to the internal capsule (and ? corpus callosum), the remarkable fact that such complete motor-vocal aphasia was associated with no agraphia is of the greatest interest. Another point in the case which should be noted is the long persistence of the paralysis of the right side of the face. The clinical history is as follows.

The patient, a married woman, aged 27 years, was admitted to the Edinburgh Royal Infirmary on Jan. 23rd, 1900, suffering from right-sided hemiplegia, loss of speech, and pain in the left side of the head.

History of present illness.—A fortnight before admission to hospital she was attacked with influenza; for the first few days of the attack she continued to go about the house, but on Jan. 13th her throat became so inflamed that she had to go to bed. She was doing well until Jan. 18th (six days before admission), when she was suddenly seized with head symptoms. She got out of bed at 5 P.M., suddenly felt giddy, felt her hands numb, and fell backwards, striking the

back of her head; on rising from the floor she fell forwards and bruised her forehead; she then managed to crawl back into bed. At 6.30 (one and a half hours after the onset of the attack) her husband returned from work and found her in what he thought was an unconscious condition—lying on her back, unable to speak, the limbs being rigid. She became conscious soon after her husband came home but could not speak. (A very full description of the onset was written by the patient on Feb. 26th, 1900.) Her husband and mother state that her face was twisted to one (they think the right) side and that both legs and the right arm were stiff. She complained of pain in the forehead and right side of the face (probably due to the fall). The stiffness of the limbs (legs) soon passed off but the right arm remained paralysed. The medical man who saw her soon after the occurrence of the lesion kindly sent me the following account of the condition:—

28th January, 1900. I saw Mrs. — for the first time late on Thursday, the 18th inst. I learned that she had been confined to bed for about a week with an acute condition, probably influenza, and that she was just recovering from her menstrual period. Mrs. —'s mother who was nursing her thought she was almost better and had left her for a few hours alone in the house that afternoon. It was subsequently ascertained that Mrs. — had risen from bed to attend to a messenger at the door and in going back to bed had fallen twice. When I saw her her general expression was anxious. Temperature 98° F.; pulse 100. The pupils seemed equal and reacted to light. The tongue on protrusion pointed towards the left side, the mouth seemed slightly drawn to the right, and she was unable to close the lips on the left side. She could move both arms. The legs were rigid and extended and on abducting one the other was adducted. The patellar reflex could not be obtained. Sensation seemed diminished for the first two days when the left side became hyper-sensitive. The hearing was good and Mrs. — seemed to understand what was said to her. She complained of a frontal headache. She could recognise the time on a watch and could write the first two letters of her name. She got a mixture of iodide and bromide of potash with ergot.

It is difficult to explain the medical man's statement that the face was twisted to the right side and the tip of the tongue when protruded turned to the left, for on the patient's admission to hospital the right side of the face was paralysed and the tip of the tongue when protruded was turned to the right side. On Jan. 22nd (four days after the onset of the cerebral attack) the legs again became stiff and rigid, but not so stiff as on the previous Thursday, and her arms were, it is said, held up in the air in front of her. During this attack she complained of pain in the region of the heart. The patient was quite cheery after this attack and swallowed some gruel with more relish than she had done before. Since the onset of the attack up to the time of her admission to hospital the patient has not spoken any word.

History prior to the present illness.—Since the age of 16 years the patient had at times had attacks of *petit mal*, never any convulsions. Two years ago a small tumour was removed from the "mouth of the bladder"; about the same time she suffered from bad varicose veins in the left leg. Two years ago she had a slight attack of rheumatic fever and for the past year had been short of breath on exertion and had had occasional palpitation. She was married four months ago; since her marriage she had been "nervous and easily startled."

Family history.—The patient is the sixth child in a family of 15. Five of her brothers and sisters died in childhood. Her father died from pulmonary tuberculosis at the age of 50 years; a brother died from pulmonary tuberculosis at the age of 33 years; and one brother has had rheumatic fever. Her mother and the other surviving members of the family are well and strong. There have been no nervous troubles amongst her near relatives. Her home surroundings are quite satisfactory and her household duties are not heavy. She is quite happy in her marriage.

Condition on admission.—The patient was right-handed. She was well nourished. She lay with her head slightly turned to the right side. Her expression was at times suggestive of suffering. She was mentally quite alert. She had difficulty in swallowing owing to an inflamed and swollen throat. The left leg was swollen and painful below the knee owing to inflammation of varicose veins. The right side of the face was markedly paralysed and the tip of the tongue when protruded was turned to the right side. The paralysis chiefly involved the lower facial muscles but the orbicularis palpebrarum was also affected; the left orbicularis palpebrarum also seemed weak but much less so than the right. The right arm was relatively weaker than the left; the grasping power in both hands was feeble (dynamometer, right = 20; left = 25). The right leg was

also weak but not so markedly so as the arm. All the movements in both legs and both arms could be performed, but slowly and weakly. It was difficult to compare the motor power of the legs, for the veins in the left leg were inflamed and the slightest movement of the leg caused pain. There was no ocular paralysis. The pupils were equal and small in size, they reacted actively to light and on convergence. The optic discs were normal. The knee-jerks were active and apparently equal on the two sides (but it was difficult to make comparative tests because of the inflamed condition of the veins in the left leg). There was slight ankle-clonus on the right side. The plantar reflex showed an extensor response on the right side; there was no toe movement on the left side. There were some anaesthesia and analgesia on the right side of the face; the skin sensations were elsewhere normal. Vision was normal; there was no hemianopsia. Hearing was impaired in the right ear. Taste was impaired on the right side of the tongue. Smell was abolished in the right nostril.

Speech functions.—The patient was right-handed. She understood everything that was said to her (no word deafness). She was totally unable to speak (complete motor aphasia). She could read quite well (no word blindness) and there was no hemianopsia. She had difficulty in holding a pen or pencil but seemed to be able to write quite well if it were not for the manipulatory defect. She wrote her name and a short sentence dictated to her (no agraphia). She correctly indicated on her fingers the number of syllables in the following words: "papa," "mama," "Constantinople." She was quick at understanding signs. So far as could be judged her intellectual faculties were not affected in any way. The sole defect seemed to be inability to speak (motor aphasia). She did not say any word spontaneously. She did not say anything in answer to a spoken or written question. She was unable to repeat vocal speech; but when the words "papa" and "mama" were slowly articulated and her attention was directed to the lips of the speaker she managed to copy the movement and to whisper the words in an imperfect way.

Circulatory system.—For the past year the patient had been short of breath on exertion and had at times had palpitation. There was some roughness before the first sound in the mitral area (mitral stenosis). The pulse was 80, regular, and weak. The urine was normal.

On Jan. 29th the inflammation was extending up the veins of the thigh. The throat was better. On Feb. 2nd the paralysis of the right side of the face was less. The patient had been practising the repetition of vowel sounds spoken to her. She was able to repeat a, i, o; she made an attempt at e, but could not manage u or ah; she made a good attempt to repeat "no" and "pa," but could not say "yes." She could answer spoken questions in writing; the only defect seemed to be due to inability to hold the pencil. In answer to the following questions she made the following replies in writing: *Q.* What day is it? *A.* Friday (correct).—*Q.* Have you any pain? *A.* A little in the thigh.—*Q.* What sort of pain is it? *A.* Shooting pain. When told to ask some questions in writing, she wrote the following: "If I will get my speech back Dr." She was told to write me a letter and to give it me in the morning. On Feb. 3rd she gave me the following well-written letter:—

Good morning Dr. Brambell. I am very pleased to say that I feel myself getting so much better every day and I am so delighted with myself at being able to say a few words for I was giving up hopes of ever being able to speak again but many thanks to you all for your attention to me for I don't think I will be long or I am better. My throat is a great deal better. I am able to swallow much better now and the right side of my face has not such a dead feeling in it now it feels stiff and weak but hopes it will get all right in a short time. I will wait patiently till I get better. My leg is ever so much better I have just a little pain in the thigh and my leg a bit stiff with being slung in the cage. I had a good night's rest but had a strange dream of being beside a great many wild beasts and I was in an awful state to get away from them but could not run with the cage tied to my leg. I fancy I see myself hobbling around them trying to get away but they have not caught me for I am all safe. I am Yours sincerely AGNES —.

The patient looked brighter. She repeated well (vocally) the following letters: a, e, n, o, p, t; imperfectly, b, d, g, i, j, l, s, x; unable to repeat, c, f, h, k, m, q, r, u, v, w, y, z. She repeated the following words: "no," "yes," "hat," but was unable to repeat "Agnes" (her own name), "better," "dog," "cat," "fat," "thin." When asked whether her throat was better she answered distinctly "Yes." When told to repeat the words "Agnes" and "Bella" she said "Ag" for "Agnes" and "Bell" for "Bella." On Feb. 5th the temperature had risen to 100.4° during the previous night and the patient complained of shooting pain in the left

temple. To-day the temperature was normal and the patient seemed all right. On the 6th she handed me the following letter:—

Good morning Dr. Bramwell. I am very pleased to say that I feel ever so much better this morning. I had an awful sore head yesterday but it is quite better this morning. I had a good night's rest and had a very good breakfast and was able to chew a piece of bread so that my face is a great deal better now the stiffness is nearly all gone and my leg I am thankful to say that I don't feel any pain in it this morning. I think I will be all right soon if I had back my speech again which I am practising and learning. I am Yours sincerely AGNES —.

She made an attempt to say "Good morning" and "Good night." To-day she was able to repeat the following letters (vocally), a, b, d, e, f, i, l, n, o, p, r, s, t, oo for u, and v. She could not say the other letters of the alphabet—c, g, h, j, k, m, q, w, x, y, and z. She repeated indistinctly the words "five," "six," "nine," and "ten." On Feb. 8th she handed me the following letter:—

Good morning Dr. Bramwell. I am very pleased to say that I feel myself getting so much better every day and I also feel stronger. I have no pain in my leg now it feels quite gone and I am able to move it up and down now and the pain in my head is gone also. My face is improving very well and I am able to swallow quite well now but not able to chew very well on the right side yet but it is a great deal better than it was. I am learning to speak a little more there is a few more words I have been practising which I am able to say there is some words that seem to stick in my throat that I cannot get out at all. I am Yours sincerely AGNES —.

She said "nurse," "doctor," and, pointing to her leg, "no pain now." To-day she repeated the letters g, h, m, which she was not able to do before. On Feb. 19th the patient had steadily improved since the last note. She could now say a great many new words. She said "Dr. Bramwell" (the "w" was not well pronounced), "Dr. Seager," and "Nurse Beattie." When asked to say a long word, such as "hippopotamus," she said "I tried it but it was too big." She could say most words now so as to be intelligible, but the pronunciation and articulation were often defective. She felt well and was very bright; the facial paralysis was greatly improved. The inflammation of the veins of the left leg was now almost quite well. On Feb. 26th the patient continued to improve as regards speech and handed me the following written account of the onset of the attack:—

DEAR SIR,—Not having been able to make anyone understand how I fell I will try to explain it as well as I can here. On the Thursday afternoon that I turned ill I got out of bed after Mother went out. I was told not to rise but I felt so well that I rose and after coming out of bed I sat down on a chair to put on my clothes when I had been a few minutes on the chair I felt my head getting giddy but I thought it would pass off and I started to put on my clothes my hands became funny there was a sort of tingling feeling in them and they began to get awfully big and my head became more giddy that I was frightened my hands were getting so big that I gave a sharp turn round to look if there was anybody at the back of the chair for my hands did not seem to belong to me. I rose from that chair and went to one opposite thinking it would be better but whenever I tried to move my hands they were always getting bigger and my head was so giddy I could hardly see everything seemed black before my eyes. I again rose and stood between the chairs but I was no sooner on to my feet than I fell on the floor on my head. I was stunned with the knock I got and when I came round a little I tried to rise but had not strength to get up. I managed to get hold of the leg of a chair to pull myself up but I pulled the chair on to my forehead perhaps that is what bruised my forehead I cannot tell. I again tried to rise by means of chacking [catching] hold of a cover of a box and this time managed to get up when I had just got up the Bell rang with an awful peal from the foot of the stairs but I was so stupid and dazed that I did not know how I was to get to the door and the Postman came up 3 pair of stairs and was making a great noise rapping on the door before I managed to get to it I remember opening the door but all I seen was a light and I suppose it would be the postman's lamp. I was so giddy and felt all out of sorts I don't mind of ever getting the letter into my hands but Mother has told me since that she found the letter at the back of the door after she came home it is no distance from the door to the bedside and it was with great difficulty I got to the beside [bedside] and when I was in front of the bed I again fell on the floor with a thud on my face this time I tried to scream but could not I tried to get up but I found my limbs stiff and sore I tried after to get up I at last got hold of the bed clothes and it was with difficulty I got partly into bed. I do not know how I managed to get into bed at all my limbs was so stiff, but I do not remember any more until my husband came in. I never heard him come in and I never saw him come in he says he spoke to me and I only looked at him in a dazed manner I don't mind anything about that but when I did come to myself again he was standing at the bedside and he spoke to me again and it was when I tried to answer him that I found I could not speak and I was so stiff and cold that I could scarcely move and when Mother came in she sent for the Doctor. I think I have made some mistakes in spelling hope you will make it out. I am Yours sincerely AGNES —.

On April 25th, 1900, the patient was discharged. She was able to speak fairly well but somewhat slowly. She could repeat all the letters of the alphabet and numbers and was able to name all common objects shown to her. She stumbled most over the labials. There was still slight paralysis of the right side of the face.

Subsequent progress of the case.—On April 25th, 1901, the patient was seen at the Infirmary. She felt quite well; better, she said, since her discharge from hospital than she was for a long time before her illness. She still spoke thickly; she had the greatest difficulty with labials. If she became excited she said she was at times unable to speak though she knew what she wanted to say. There was still some weakness of the muscles on the right side of the face, especially the lower face. The right hand was also weaker than the left (dynamometer, right = 55; left = 85). On Sept. 2nd, 1903, the patient felt very well. The fainting turns (*petit mal*) which she had had since the age of 16 years were more frequent than before her illness; they generally occurred once a month, sometimes with the "period"; she had never had a convulsion. There was still slight loss of power on the right side of the face. Her speech was still difficult if she became excited or tried to speak quickly. When she spoke quietly she could say what she wished quite well. If she became excited, "the words," she said, "won't come out." She felt the right side of the face to be a little stiff; she thought that the difficulty in speaking was due to this. There was no obvious facial asymmetry except when she spoke. When she showed her top teeth the two sides of the face seemed to act symmetrically and equally. There was no weakness of the orbicularis palpebrarum. On Sept. 20th, 1905, the patient had been very well since last seen. She still felt the right side of her face a "little stiff" and she still, when excited, had some difficulty in articulation. When she spoke the mouth was still drawn a little to the left side.

Diagnosis.—There can, of course, be no doubt that in this case a sudden organic brain lesion, probably either embolism or hæmorrhage, was the cause of the symptoms. The following facts all seem to be strongly in favour of embolism rather than of hæmorrhage: the age of the patient, the presence of mitral stenosis, the sudden occurrence of the lesion during a febrile attack attended with severe sore-throat and phlebitis, and the brief duration of the coma, if coma was actually present at the onset. The sudden onset seems to negative thrombosis. The embolism probably affected the left middle cerebral artery or some of its branches, but there are some features of the case (the loss of sensation on the right side of the face, the loss of hearing in the right ear, and the loss of smell in the right nostril, if these developed as the result of the lesion) which perhaps suggest a lesion of the posterior end of the internal capsule. But against this localisation is the fact that the leg was much less paralysed than the arm and the face. So far as the paralysis is concerned, and granting that the lesion was an embolism of the left middle cerebral artery, the lesion would appear to have been cortical and subcortical—a softening of the lower end of the motor area on the left side.

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OBSERVATIONS ON THE THYMUS GLAND IN CHILDREN.

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ALTHOUGH a large amount of experimental and clinical work has recently been published concerning the thymus gland there is probably no gland in the body about which so little is generally known and about which so little interest is generally taken. The facts that its functions, whatever they may be, cease after childhood and that it is seldom the seat of gross organic disease are doubtless partly responsible for the indifference shown with regard to it, while the uncertainty of our knowledge as to its value to the organism prevents much space being devoted to it in the ordinary text-books. In the present paper certain observations will be recorded bearing on some more or less disputed points; for further information as to the thymus the reader is referred to the recent works mentioned in the footnotes in this article, among which the most exhaustive and informing are those by Bonnet¹ and Dudgeon.²

The materials on which the present paper is founded were obtained in the post-mortem room at the Bristol Children's Hospital and comprise observations on over 50 cases. These cases were not selected but taken consecutively in the ordinary course of the pathological work. As far as possible the weight of the child post mortem and weight and condition of the thymus have been noted in every case; sections of the gland have been made and stained by various methods and the results grouped according to the clinical history and cause of death. I am indebted to the honorary staff of the hospital for permission to use the clinical notes of the cases. The points I intend dealing with are: (1) the weight of the normal thymus; (2) the fibrotic changes in the thymus as occurring in chronic wasting diseases in children; (3) fibrotic changes in acute disease; (4) hyperplasia of the thymus; and (5) certain points connected with the pathological histology of the thymus.

The weight of the normal thymus.—Unlike most of the normal viscera, the weights of which only vary slightly in different individuals, the thymus gland appears to show great difference in size and weight. Dudgeon has drawn up a table showing the various estimates of different observers, the older writers being inclined to give a much higher estimate than is borne out by recent observations. Many of them put the average weight at half an ounce at birth, increasing to one ounce at two years, and then slowly decreasing till puberty. Testut, however, considers five grammes (77 grains) the average weight at birth, and Thursfield puts it at 6·7 grammes (103 grains). Dudgeon himself works out the average of his cases at 7·1 grammes (109 grains). No doubt great variations may occur, but it is important that the microscopical structure of a thymus should be noted before the organ is accepted as normal. In my own series of cases 14 glands were normal on microscopical examination, the ages of the children varying from one month to seven years. The average weight was 128·7 grains (8·34 grammes), the smallest from a child aged three months weighing 30 grains (about two grammes) and the largest from a child aged ten months, weighing 398 grains (26 grammes). 11 of these children were under one year of age, and of these only four had thymus glands weighing more than 100 grains, the average weight of the remaining seven glands being 53·5 grains (3·5 grammes). I should therefore be inclined to put the usual weight of the thymus at birth below 100 grains and to consider the possibility of larger glands being examples of some pathological condition. Noël Paton and Goodall³ in a series of observations on the thymus gland in guinea-pigs found that though the gland varied greatly in weight it bore a fairly constant ratio to the body weight of the animal at birth. It is, however, very doubtful whether the period of active usefulness of the gland is the same in all animals, and there is some reason for holding that in children its period of post-natal importance is longer than in young guinea-pigs. At any rate, I could find no indication of such a correspondence to body weight in my own cases in children nor does Dudgeon's more extensive series show any reason for supposing it to exist.

Fibrotic changes in the thymus in chronic wasting diseases.—The normal functional extinction of the thymus takes place by a process of fibrosis. The septa between the lobules, which in a healthy infant are very slight, increase enormously and encroach on the glandular structure; the lymphoid elements decrease, the whole organ shrinks, and the distinction between the cortex and medulla disappears; it is usual, however, to find a minute amount of gland tissue still remaining in the normal adult thymus. In various atrophic conditions in children this process occurs with great rapidity, so that it has been said that an estimate of the nutrition of an infant may be formed by an examination of the thymus gland. Dudgeon has classified his cases into primary and secondary, the former including all cases of what is commonly known as marasmus, the latter including chronic diseases which involve marked loss of body weight such as tuberculosis. I have examined 12 thymus glands in marasmic infants. These infants were all under one year of age, the youngest being one month old; they were all considerably

subject:—Cautley: Clinical Journal, April 6th, 1904, p. 395. Sinnhuber: Zeitschrift für Klinische Medizin, Band liv., No. 1 and 2, p. 38, 1904. Magni: Archiv für Kinderheilkunde, Band xxxviii., No. 1 and 2, p. 17, 1903. Goodall: Journal of Physiology, vol. xxxii., No. 2, p. 191 (with Bibliography).

³ Noël Paton and Goodall: Journal of Physiology, vol. xxxi., No. 1, p. 49, 1905.

¹ Bonnet: Gazette des Hôpitaux, Dec. 9th and 16th, 1899 (with Bibliography).

² Dudgeon: Journal of Pathology and Bacteriology, 1904-05, vol. x., p. 173 (with Bibliography). The following papers also deal with this