A CASE OF FRONTAL LOBE TUMOUR.

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MENTAL symptoms are a well-known accompaniment of cerebral tumours, but the case to be described below developed a surprising degree of dementia in ten months, and even to the last there was only presumptive evidence of a neoplasm. Mental symptoms are stated to be present in 60 to 80% of brain tumours. Schuster (1) reviewed 775 cases, and found that 100% with corpus callosum tumours and 79·3% with frontal lobe tumours showed psychic phenomena. The usual changes are said to be dullness, somnolence and irritability. The frontal lobe tumour is supposed to be associated with mild euphoria, and a tendency to pun and joke—the so-called "Witzelsucht"—not, however, shown by the present case. Osler's (2) statement that the mental deterioration is particularly prominent when the left frontal lobe is involved is strikingly confirmed, and Kurt Goldstein (3) has no doubt about this.

There have been recent discussions on these tumours at the Second International Neurological Congress in London, 1935, and at the B.M.A. Annual Meeting at Melbourne. Herman Bouman (4) reports a peculiar mixture of infantile, boorish and good-natured behaviour. Kurt Goldstein (3) found that lesions of the frontal lobes, especially on the left side, were associated with a "deficiency behaviour"; the patient shows a lack in voluntary performances, but does well if his actions are decided directly by his surroundings. This disturbance is not limited to one function, as for example attention or memory, and it is a variable defect, the response of the patient being at times quite adequate. Penfield and Evans (5) report 3 cases in which an extensive area of the frontal lobe was removed surgically, leaving the precentral gyrus intact. Remarkably little disturbance of function could be demonstrated: one case lost the capacity for mental arithmetic; the other 2 cases showed a defect in initiative and the capacity for planned action. Jacobsen (6) has studied the experimental removal of the frontal association areas in monkeys which had been previously trained in certain behaviour tests. He found that unilateral lesions did not impair performance in any of these tests, though bilateral lesions severely damaged responses involving the retention in memory of recent experience.

The case I am reporting is an example of the possibility of diagnosing a cerebral tumour in the absence of the classical signs of headache, optic neuritis,

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vomiting and slowing of the pulse. The epileptiform convulsions are of importance in this connection. Bruns' frontal ataxia was not noted, nor was there any alteration in muscle tonus as described by Prof. Nitikin of Leningrad (7) in his series of 20 cases.

History.

The patient was a coal-miner, æt. 54, with the history of steady employment till five years ago, when he was obliged to give up on account of miners' nystagmus. He was stated to have been a cheerful, sociable, even-tempered man with plenty of friends. In November, 1934, he had an operation for ischio-rectal abscess, and since then he had gradually lost interest in his surroundings. On May 1, 1935, there was " a series of fits for several hours " without any paralysis or loss of speech, and after this it is said his mental condition deteriorated, and three weeks before admission he had grown markedly worse. He was described as having become dull, vague and stupid. He did not talk, and would sit about fiddling with a bit of paper. He lay in bed all day unless made to get up. He took no interest in anything, and gazed blankly at his friends. His relations say he had to be dressed and washed, and that he wet and soiled both his clothes and bedding. He was never irritable, and he did what he was told, but he would take his own time about it. He had gained weight lately.

Physical State on Admission.

On September 16, 1935, he entered Cefn Coed Hospital as a voluntary patient. At admission he was observed to be obese, and some myocardial degeneration was present. His blood-pressure was 140/95. His pupils were equal, regular and brisk in reaction to light; there was no optic neuritis or nystagmus. The tongue showed a coarse tremor, and there was slight weakness of the right side of the face. The abdominal reflexes were brisk on the left side and absent on the right, and the speech showed slight slurring. The knee- and ankle-jerks were equal and brisk, and the plantar responses both flexor. The blood Wassermann was negative. The cerebro-spinal fluid examination showed a clear fluid under high pressure; it filled the bulb, and was still 270 mm. pressure after removal of 7 c.c. in the recumbent position. There were no cells, the protein was 30 mgrm. per 100 c.c., glucose 65 mgrm., and chlorides 760 mgrm. The gold curve was negative (0000000000), no globulin was found, and the Nonne Apelt and Pandy reactions together with the Wassermann were negative.

Mental State.

He showed profound dullness, had to be dressed and undressed; made no attempt to help or occupy himself; required prompting to eat, and was

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exceptionally faulty in his habits. He showed retardation in thought and action, and there was marked fatiguing of attention. The first few questions were answered correctly, but he rapidly tired. Then questions had to be repeated again and again to get a response, and his replies became random and incorrect. His memory for recent events appeared to be better than for remote events. He was not in any way restless or irritable ; on the contrary he was rather good-natured. He showed a partial aphasia. When given a pen and asked what it was, after hard thinking he said, " Call him west ", but he was able to say it was used in writing. He recognized a penny, but not half-a-crown. He knew a pipe, but not an ash-tray. The accuracy of his answers varied remarkably from day to day. He was able to write his name, but his address was distorted out of recognition ; though he used to be a good writer, " Beaufort Terrace " was rendered as " Blaenhain Ladle ". He realized he was not himself, and he knew his memory was bad. He even appeared to grasp that it was the names of things that caused him most difficulty. He did not complain of headache, and there was no history of vomiting. His pulse was 76 to 80.

Seven days after admission he vomited his breakfast and became comatose, and the evening temperature rose to 101°. Next day he was unable to swallow, the right pupil was larger than the left, and respiration was stertorous, with signs of cerebral irritation. Three days later his temperature was 104·6°, probably due to hypostatic pneumonia, and he died without regaining consciousness ten days after admission.

Post-mortem Appearances.

On removing the skull the convolutions were seen to be flattened, the cerebro-spinal fluid was diminished in quantity and a slight pressure cone was present. The cerebral arteries were not thickened. The left frontal lobe was a little larger than the right. There was slight bulging at the front end of the corpus callosum, which on section was seen to be œdematous and softened at the genu. The left frontal lobe contained a centrally placed yellowish tumour forming roughly a sphere of $4\frac{1}{2}$ cm. diameter, soft and necrotic, its edge being congested and without a capsule. It was limited to the white matter, approaching the grey matter more nearly at the orbital surface. The lungs showed anthracosis and early hypostatic pneumonia, and the heart muscle was degenerated. Microscopic examination showed the tumour to be a spongio-blastoma multiforme. The constituent cells were of many various shapes, and included large numbers of multinucleated giant-cells, and mitotic figures were frequent. There were no glial fibres present, and proliferation of vascular endothelium was well marked in some areas. This was confirmed by Dr. Sladden, the visiting pathologist to the hospital.

The diagnosis of this case opened a field for discussion. It was classified

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as an organic dementia. Hughlings Jackson's law of nervous dissolution was illustrated—the latest acquired and most complex characteristics were lost first. A vascular lesion was ruled out by the history of the onset. The cerebro-spinal fluid examination and Wassermann reaction excluded both gumma and general paralysis. The so-called secondary dementias were hardly likely to have developed in such a short time. The age of the patient being against a tuberculoma, it was regarded as a cerebral tumour, probably situated in the left frontal lobe. The group of fits in this patient have no localizing value, but their isolated character in a man of 54 make a useful diagnostic point.

The absence of all the classical signs of cerebral tumour raised the question whether one could persist in that diagnosis. The lumbar puncture established a markedly raised intracranial pressure, but localizing signs were few. Slight weakness of the right side of the face, absent right abdominal reflexes and interference with speech were in favour of a left-sided lesion. Speech function was the most important localizing sign in this case. The patient showed a variety of sensory aphasia known as agnosia, since he failed to recognize common objects. The example of his writing showed he also had some degree of motor aphasia. In a right-handed person it is generally believed that the brain area controlling the speech mechanism is situated chiefly on the left side. The presence of a slight degree of general aphasia when the lesion was limited to the interior of the frontal lobe tends to confirm Head's (8) opinion that speech must be regarded as a whole, and to discountenance the diagrammatist's view of strictly localized speech areas. The paucity of localizing signs and the absence of the classical symptoms were in favour of the lesion being in the frontal lobe, and the presence of profound mental changes suggested it was likely to be in the left frontal lobe.

Summary.

1. A case of left-sided frontal lobe tumour is described, and the recent literature of these tumours is reviewed.

2. The differential diagnosis in such a case is discussed.

3. The prominence of mental symptoms in the left-sided tumour is stressed.

4. The absence of classical symptoms and the presence of aphasic symptoms in a case of tumour deep in the frontal lobe are raised as diagnostic and localizing points.

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References.—(1) Henderson and Gillespie, *Textbook of Psychiatry*, 1927, p. 347.—(2) Osler, *Principles and Practice of Medicine*, 1919, p. 1011.—(3) *Brit. Med. Journ.*, August 10, 1935, p. 270.—(4) *Ibid.*, October 12, 1935, p. 690.—(5) *Brain*, 1935, lviii, p. 115.—(6) *Arch. Neurol. and Psychiat.*, 1935, xxxiii, p. 558.—(7) *Brit. Med. Journ.*, August 10, 1935, p. 270.—(8) *Brain*, 1920, xliii, p. 87.

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