verse case. It was known that symptoms referred both to rapid growth and sexual irritation were present in pineal gland tumors, so that a similar course of reasoning with the pineal gland might be considered as the cause of the symptoms. The specimen was presented to illustrate the relationship of the crural tumor with the pineal gland and the hypophysis.

Dr. Abrahamson spoke of a case of encephalitis of the posterior peduncular area and the pons, at present in the Montefiore Home. A considerable similarity as to signs existed. There were crossed hemiplegia; crossed astereognosis, plus lesser disturbances of the threshold of pain and tactile sensation; crossed disturbances of the sense of postural movements, but less of the posture sense; homolateral oculomotor involvement; crossed ataxic tremor, namely, of the upper extremity and less marked homolateral tremor. Dr. Abrahamson could not agree with Dr. Timme's explanation of the occurrence of the astereognosis.

Dr. M. Allen Starr said that it seemed to him that in regard to the sexual disturbance that the work of Cushing had established the intimate relationship of the hypophysis to the sexual functions. These symptoms must be ascribed to some disturbances of the function of the pituitary body. Dr. Cushing had also called particular attention to the effect of pressure by tumors upon the circulation in the arteries of the medulla and base of brain. Was it not possible therefore that the pressure of this tumor, instead of irritating the hypophysis by pressure merely, may have had some effect by causing very marked congestion and a hyperactivity in the gland and that this produced priapism and marked growth of the bones, which was characteristic of disease of the hypophysis?

Dr. Timme said that Marburg had studied one case of pineal gland involvement showing these symptoms of sexual disturbance and rapid growth in a child of ten, so that the syndrome could be attributable to either one of the two glands. Personally he agreed with Dr. Starr that it was the hypophysis rather than the pineal. The pineal gland could adjust itself. The hypophysis could not. If the case was merely one of pressure every tumor would show the same symptoms, but they did not. The pressure in the ventricles in this case was very slight, indeed almost normal, so that the symptoms could not be secondary to the disturbance in the ventricles. The symptoms existed before any papilledema appeared.

A CASE OF BOMB WOUND OF THE RIGHT TEMPORO-SPHENOIDAL LOBE, WITH SOME REMARKS ON THE HEREDITARY CHARACTER OF LEFT BRAINEDNESS AND RIGHTHANDEDNESS

By Foster Kennedy, M.D.

The patient referred to was a soldier, wounded on August 5, 1915, near Arras, in first line trenches. He was admitted to the Hospital Militaire, Ris Orangis, September 25, 1915. The man stated that while making hand grenades he "suddenly became unconscious," but he remembered dimly being bandaged in the trenches and being carried to the second line. He was redressed by ambulance men and carried to a field hospital. He remained completely conscious and did not lose consciousness again. He received anti-tetanus serum immediately after being wounded. On August 7 he was operated on without anesthetic. He did not know whether anything was extracted or not. He had no convulsion or headache or any difficulty with speech. Four days after the injury the left arm and leg felt "as though they had been slept on," but this became better when he got up. This feeling of numbness

was present when admitted to the Ris Orangis hospital. He never had pain in the left arm or leg. On September 25 he said he felt very well. Over the right temporal and lower temporo-parietal region there was a wound. A scar existed, apparently the result of a semicircular subtemporal decompression. An infection had evidently occurred in the wound, the upper sutures having broken and the whole skin flap having fallen about 5 cm. The posterior margin of the skin flap was turned in. The upper portion was clean, with a granulating surface measuring 8 by 2½ cm. In the posterior margin of this wound, behind the ear, there was a sinus about 5 cm. long, which extended inward and forward parallel to the external auditory canal. There was a marked bone defect and the brain pulsated in the granulating area. Examination showed: pupils equal, with brisk reactions; sight emmetropic on left side. The right eye was myopic by four diopters. Optic discs: the left showed some tortuosity of the veins. The physiological pit was filled in and the left upper temporal quadrant was obscured by slight swelling. The right fundus was normal. Dr. Kennedy here pointed out that the formation of the myopic eyeball was such as to permit rapid drainage of edema accumulating at the nerve head, in consequence of this a well-marked papilledema occurring in a myopic eye-ball was not at all a common phenomenon. One would be justified in believing that had the patient had normal vision in both eyes, he would have had some papilledema in both fundi. There was no nystagmus, diplopia or strabismus. The lower jaw, on opening the mouth, swung to the right side, this being not due to a lesion of the motor root of the fifth nerve, but to a fracture of the right zygoma. The general hypesthesia of the left side was seen in the face as elsewhere, but there was no localized fifth nerve paralysis. Seventh nerve: the left frontalis muscle moved actively, the right not at all. On the other hand he could only close the left eye weakly. The left lower face was distinctly paresed for both voluntary and emotional movement, thus showing damage respectively to both the right facial cortical center and the right optic thalamus. The right frontalis muscle was inactive probably because the twigs of the right facial nerve supplying it were involved in the bomb wound and operation scar already described. The right membrana tympani had been ruptured and hearing proportionately diminished in the right ear. The tongue swung markedly to the right on protrusion. The swinging of the lower jaw to the right had overcome the tongue's hemiparetic tendency to go to the left. The patient was an intensely lefthanded man. He had no word deafness whatsoever and he named objects of which he had visual recognition promptly and accurately. He had no apraxia or alexia. His memory was good. He read and wrote in a manner only interfered with by hemianopsia which on the left side was complete to the fixation point. Patient's father and mother were both righthanded persons. He was an only child and knew of no other lefthanded persons in his connection. Motor system: there was distinct and general softening and atrophy of the muscles of the left arm and leg, there being a difference between the left and right upper arm of 2.5 cm., between the two thighs of 2.5 cm. and between the two legs of 2 cm. There was no tremor or athetosis. Slight ataxia of the sensory type existed in the left upper extremity. The weakness in the left arm was more marked than that in the left leg, though proportionately less marked than that in the left face. He could not stand on the left leg alone. There was considerable titubation, probably the result of a lesion of Türk's bundle, uniting the pons and the temporal region. There was distinct lowering of touch and superficial pain and deep muscle pain sensation over the whole of the left side of the body. No mistakes were made in sense of position nor in the discrimination of temperature. There was a slight slowness in the recognition of unseen objects held in the left hand, but in this regard also no mistakes were made. Re-

flexes: all deep reflexes on the left side were exaggerated in degree. Abdominal reflexes were present on the right and absent on the left side. Plantar reflexes: right flexor, left extensor. Dr. Kennedy pointed out that owing to the fact that the patient was left handed to an extraordinary degree, one would have been justified in looking for a correspondingly marked degree of disturbance in speech, manifested in him as a result of the massive injury sustained by the right temporo-sphenoidal lobe. He showed a photograph of the patient, together with two radiographs of his skull, which showed fragments of the grenade and the driven bone flung through the cortex and embedded in the right occipital lobe. It was pointed out that the usual teaching up to the present time had been that in lefthanded individuals, the centers subserving the function of speech were to be looked for in the right side of the brain; therefore a sudden injury of such severity as that described in this patient should have severely crippled the patient's communication with the outside world. In view of the seriousness of the lesion, it was only possible to suppose that the patient's immunity from this condition lay in the fact that, in spite of his lefthandedness, as far as his speech centers were concerned, he was leftbrained. Dr. Kennedy discussed some of the theories which had been put forth to account for the prevalent condition of righthandedness. He said that flint instruments of the paleolithic period showed that there had been as many lefthanded tools as those adapted for the right hand, consequently only in the evolution of mankind had righthandedness become more and more a general characteristic. Ophthalmologists had pointed out that in the vast majority of people the right eye dominated over the left, and some of them had ascribed the dominance of the right hand to this condition. In the case under discussion the right eye was myopic and the left normal. Conceivably under this condition the patient's lefthandedness might have thus arisen. On the other hand the hereditary trend was entirely righthanded, and presumably leftbrained, that is to say, he had acquired lefthandedness, though by heredity he was leftbrained. In this connection a case was quoted of a woman, 22 years of age, at the National Hospital for Paralyzed and Epileptic in London. This girl developed leftsided Jacksonian convulsions, the result of luetic thickening of the dural and pial membranes on the right brain. After each attack, over a period of twelve months, she became temporarily aphasic. She was entirely a righthanded person. Her paternal and maternal heredity showed lefthandedness. These considerations would make one consider the advisability of investigating, not only whether or not the patient was right or lefthanded, but also whether or not the family stock showed any anomalies in this regard.

Dr. Sachs said that there was one point that could be noted without going back to the history of ancestors. The majority of children were ambidextrous. Almost every child was born so and remained so until taught to use the right hand more than the left. There were relatively few exceptions to this rule. Parents had trouble in teaching the child to use its right hand in preference. Many children would be lefthanded if not taught to use the right. Centuries of civilization had insisted that the right side of the body was better than the left. Dr. Sachs thought it was largely a matter of artificial education. In studies of the child's brain in early life the speech function was not found exclusively in the left hemisphere. There were as many changes in one hemisphere as the other.

Dr. S. E. Jelliffe said in reference to right and lefthandedness, Stier had done a beautiful piece of work in the German army for a series of seven years. He had approached the problem from the hereditary standpoint. He had examined all the records of the recruits and had come to the general conclusion that lefthandedness represented an ancestral type of the race which was inferior to the righthanded type and therefore not the successful

type, and it had therefore been slowly eliminated. Lefthandedness, pragmatically considered, was an hereditary problem. The early biological determiners were as yet very uncertain, but there was some relation between the successful races, which, migrating northward, did come into a definite position to heliotropic influences. The position suggested regarding sun position and righthandedness was not as nonsensical as many superficial critics had assumed.

Dr. Ramsay Hunt said he could cite a case which had some bearing on the question of the speech disturbance raised by Dr. Kennedy, viz., a left-handed young man who had an abscess of the left temporal lobe, with right hemiplegia and right hemianopsia with definite disturbances of speech of the sensory type. He was a lefthanded man, but in spite of that had developed a disturbance of speech from a lesion on the left side of the brain. The symptoms of aphasia did not last long and in a month or six weeks all speech trouble had disappeared, the hemiplegia and hemianopsia persisting. Although this man was by nature lefthanded and performed most of the acts with the left hand which were usually done by the right, it was not so in all things, *e. g.*, he was a typewriter by occupation and performed this work like a right-handed man. It was probable that such a man was not leftbrained or right-brained, so to speak, but was rather ambicephalic. This would be one explanation for the disappearance of the aphasia in such a case, the speech mechanism having a bilateral distribution.

Dr. Fisher said that he would like to relate a case which he saw that day of left hemiplegia in a righthanded woman. Her mother, brother and daughter were lefthanded. In regard to Dr. Sachs's remark about ambidexterity, he doubted that that was entirely true. If one tried to teach a left-handed boy to write with his right hand, it was a most difficult matter. During his lifetime he retained greater facility with the left hand.

Dr. Kennedy said he would like to ask Dr. Hunt about the parents' right or lefthandedness in the case he had cited. This was the very point that it would seem worth while to investigate because the reasons given in the literature for aphasia with anomalous handedness were not very convincing. It might be worth while to see whether or not there was a sinistral tendency in the family in which the case occurred.

Dr. L. Pierce Clark asked Dr. Kennedy if the man in the first case cited was particularly clever and dextrous in the use of his hands before the injury. Lefthanded children never became very clever in the use of the right hand.

Dr. Kennedy said he had had no data upon that point.

CASE OF SYMMETRICAL WOUNDS OF TEMPORAL REGION

By Foster Kennedy, M.D.

A man came into the hospital from the trenches. When the bandages were taken off, two wounds, with marked bone defects, absolutely symmetrical, were shown of each temporal region. He could see perfectly well. The wounds were the result of a bomb explosion which had happened at his feet. The dura was seen pulsating vigorously in the wounds, on both sides. The X-ray showed two large defects, each the size of a dollar. The man had been struck by two symmetrical pieces of shell which had wounded him simultaneously. The case was not interesting neurologically, as beyond his wounds he had no physical signs.