A very high percentage of patients with Hemiplegia had complication of Auricular Fibrillation, 76.1% in average. So, both Mitral Stenosis and Auricular Fibrillation may be the cause of Cerebral Embolism. It occurred more frequently in Male, showing a ratio of 39 : 29 between Male and Female. There was no difference between the left and right hemiplegia. Investigations about neurological signs, duration, etc. . . . were reported here also.

40. Study on the Water Metabolism of Patients with Intracranial Disease by Using Heavy Water as a Tracer

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The water metabolism of patients with intracranial disease during and post operatively was studied by using heavy water as a tracer. 0.1 gm/Kg of D₂O was injected intravenously and cerebrospinal fluid, fluid in cyst, tumor tissue, normal brain tissue, urine and blood were collected. These materials' D-Atom% were measured. In each case, D₂O excretion curves into CSF and urine were described by plotting D-Atom% Ex. to semilog. graph, $y=Ae^{-kt}$ was obtained. Distribution, excretion speed, Biological Half-life, Turnover Rate etc were examined. Excretion into CSF reveals 2 modes. The cases with high CSF pressure, herniation and brain edema show high D₂O concentration in rapid appearance and start to describe the exponential curve in an early stage. On the contrary, cases with low CSF pressure but severe operative invasion under Cocktails-hypothermic anesthesia take a long time to reach a maximum concentration of D₂O and describe a gentle sloped curve, i.e. delayed peak type, and exponential curve hardly appears. Unbalanced concentration at different sites in brain and blood suggests disturbance by operative stress.

Excretion curves into urine reveal similar shapes as into CSF but their metabolic rates seem slower than those of CSF and are considered to be due to the influence of transfusion and infusion.

41. The Regional Difference in Electrolytes and Protein

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We reported in a previous paper on electrolytes and protein in the serum and

cerebro-spinal fluid of patients with mental diseases. This paper presents a description of the results of studies on regional difference in electrolytes and protein in cerebrospinal fluid. As to the spinal fluid, 10 cc of it was gathered each time to the extent of 100 cc by spinal puncture. The other methods of withdrawing the fluid were by cisternal and ventricular punctures. The measurement of sodium, potassium and calcium was made by a flame photometer; chlorine was determined by the Schales and Schales method. As to the fluid which was gathered fractionally, the first 10 cc contained sodium, potassium, calcium and chlorine in the greatest quantity, and the amount of these elements had a tendency to decrease gradually with an increase in the amount of the withdrawn fluid. Comparison of ventricular and spinal fluids revealed that the amount of the former is smaller. Electrolytes in the serum of these patients were measured simultaneously and their values lay in an almost normal range.

Proteins were studied by means of electrophoresis and polarography.

42. Polarographical and Paper Electrophoretical Studies on the Serum Protein in Epilepsy and Progressive Paralysis

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Qualitative and quantitative changes in the serum protein of patients with epilepsy and progressive paralysis were studied respectively by polarography and paper electrophoresis with the following results:

1. In comparison with normal subjects, non-treated and treated cases of progressive paralysis (treated with penicillin and heat) showed an increase in the height of the wave from the polarographically-separated serum, while they exhibited a decrease in the height of the wave in case of alkaline denaturation. The height of the wave from the filtrate reaction showed a marked increase in the non-treated cases, but treatment brought about a fall in the height of the wave, which agreed with that of normal subjects. As for the electrophoretically-separated protein, there was a decrease in the albumin fraction, while an increase took place in the gamma-globulin fraction. Regarding the glycoprotein, the alpha- and beta-globulin fractions showed an increase, whereas the gamma-globulin fraction exhibited a decrease. As regards the lipoprotein, there was an increase in the beta-globulin fraction.
2. Changes in the polarogram of patients with epilepsy were not as remarkable as those in the polarogram of normal subjects. With respect to electrophoretically-separated protein, there was a decrease in the albumin fraction, while