

3. Pathology.

The Paralytic Process and the Centres of the Extra-Pyramidal Motor System [Der paralytische Prozess und die Zentren des extra-pyramidal-motorischen Systems]. (*Zeitschr. für die ges. Neur. und Psychiat.*, February, 1924.) Kalnin, E.

The occurrence of extra-pyramidal motor symptoms in general paralysis has long been known. Vogt and Nielschowsky have published the pathological findings in two such cases with choreiform movements, in which the paralytic process had attacked not only the cortex but also the striatum, producing appearances resembling those of Huntingdon's chorea. Here the findings corresponded with the clinical picture; but it was surprising when Spatz published sixteen cases of general paralytics who had shown when living no symptoms suggestive of this incidence, but in which the striatum was found in a precisely similar condition, whereas the pallidum, in contrast to the nucleus caudatus and putamen, was not affected. He explained this by the fact that the latter are developmentally, like the cortex, part of the fore-brain wall, whereas the pallidum belongs to the mid-brain.

This finding induced the author to investigate the frequency of incidence of the paralytic process in the striatum and other parts of the extra-pyramidal system, and he selected those areas which are marked by an intense iron reaction—that is, the striatum, pallidum, corpus Luysii, nucleus ruber, substantia nigra, and nucleus dentatus cerebelli. In the cortex he took those areas usually much affected, such as the granular frontal cortex and the insula, as well as a region less commonly much affected—the occipital cortex in the neighbourhood of the area striata. His object was to see whether the most susceptible areas were really determined by their evolutionary history, taking the telencephalon on the one hand, and the diencephalon and mesencephalon on the other. Besides the regions mentioned he took also the claustrum and thalamus. He confined his study to the evidences of the paralytic inflammatory process, taking as its chief signs the plasma-cell infiltration and spider cells, and further the intra-adventitial deposits of iron pigment. More detailed studies of the whole structure and relative decrease of nerve-cells are in progress, aimed at determining the extent of damage done by the process. Only samples were taken, not serial sections. These were stained by Nissl's thionin method and the iron reaction determined. Three grades of intensity were differentiated.

His findings confirmed those of Spatz—that the striatum is one of the regions of predilection in general paralysis. In all the thirty-five cases both nucleus caudatus and putamen and the grey matter joining them showed changes which were equal in intensity with those of the most affected cortical regions. The claustrum was negative in only one case, and is more constantly affected than the occipital cortex. Only the grey matter was altered, the white matter being seldom affected. In contrast to this the pallidum,

which has unfortunately been grouped with the striatum under the name "lenticular nucleus," showed only slight changes in no more than four of the thirty-five cases, and the same holds good for the other centres of the extra-pyramidal system, all of which *may* thus be affected by the paralytic process, but are definitely not areas of predilection for it. The thalamus occupies a mid-way position; it is less frequently affected than the least affected region of the cortex, and to a slighter degree, but much more than the extra-pyramidal system (cortex 30-35, thalamus 28, nucleus Luysii 9, pallidum, substantia nigra, nucleus ruber, 4).

The only patient who had shown extra-pyramidal symptoms in life—choreiform athetotic movements and hypotonia at first, later rigidity, and who was deeply demented and could utter only inarticulate sounds—did not show more marked changes in the striatum than many other cases, and the pallidum was negative.

Thus the telencephalon would seem to be particularly susceptible to the paralytic process, in contra-distinction to the mid-brain, including in this the pallidum and the lower nuclei. Of the basal nuclei the thalamus is most affected, but much less than the cortex.

Spatz has suggested that the selection of the striatum accounts for involuntary movements and speech disorder of the disease. The author has no clinical evidence on this point to correlate with his findings.

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Studies on the Cerebrospinal Fluid with an Acetic Anhydride-Sulphuric Acid Test. (State Hospital Quarterly, February, 1923.)
Boltz, O. H.

The test is essentially a modification of Liebermann's test for cholesterol and the technique is as follows: Place 1 c.c. of spinal fluid in a Wassermann tube. Add 0.3 c.c. of acetic anhydride drop by drop; shake; add 0.8 c.c. conc. H_2SO_4 drop by drop; shake; after about five minutes examine colour of fluid against a white background. A blue-pink or lilac is positive, the blue tinge only being characteristic of the reaction. It is recommended to try the test on the spinal fluid of an advanced paretic in order to get an idea of the positive reaction.

No theoretical explanation of the test is attempted, but a few points about its behaviour are noted: (1) Sulphuric acid alone does not give the reaction. (2) Acetic anhydride alone does not give the reaction. (3) Heating the cerebro-spinal fluid to boiling will not destroy the substance giving the test. (4) The substance giving the test is thrown down with the globulins in the Noguchi test, after centrifugalization a saline emulsion of the sediment being positive, the supernatant fluid negative. (5) The test has nothing to do with the excess of globulins. (6) The substance does not seem to be cholesterol.

The result of the test on a large number of psychoses and pareses leads to the following conclusions:

(1) The test is 100 *per cent.* positive with the spinal fluids from cases of general paresis.