

The authors conclude that the deposit is due to hypothyroidism, and as the woman was so young, the deposit mostly of iron and not calcium compounds, and the site unusual, it was not a precocious arteriosclerosis. Oxidation, one knows, is poor in myxœdema, and iron plays an important part in oxidation. The precipitation of iron compounds would fit in here. Here one could equally well recall the general chromatolysis in the nervous system noted by Mott and Brun in three cases of hypothyroidism, and the part iron plays in the constitution of the Nissl granules according to Scott. Marinesco also states that considerable quantities of iron occur in nerve-cells. The authors also think that the cerebellar symptoms described in cases of myxœdema by Odien are explained by their present discovery. The psychical troubles of myxœdema are explained by the retardation of the phenomena of nutrition of the nerve-elements, also perhaps by the affected vessels causing bad nourishment of the tissues. The great mental variations between one patient and another could in a certain measure be explained by the intensity of the vascular lesions and their locality. Two good plates of microscopical appearances are given.

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*The Changes in the Central Nervous System in Spotted Fever, and their Significance for the Histopathology of the Brain Cortex [Die zentralen Veränderungen beim Fleckfieber und ihre Bedeutung für die Histopathologie der Hirnrinde]. (Arb. für Psychiat. München, Bd. i, 1919.) Spielmeyer, W.*

In 1913 Fränkel announced that the anatomical basis of the skin spots in this disease is a necrosis of circumscribed and mostly sector-shaped portions of the intima of the smallest arteries, and that, at the place where the vessel is thus affected, there is a perivascular infiltration in the form of a clump of cells, mostly descendants of adventitial and periadventitial connective-tissue cells. In 1914 he described similar punctate lesions in internal organs, especially the brain, myocardium, liver, and gastro-intestinal tract. Spielmeyer has investigated the changes in the brain and spinal cord in twelve cases, and in this paper (54 pages, 10 plates) he gives a description of the microscopical appearances. The lesions fall mainly into three groups—foci, infiltrations around vessels in the substance of the brain and cord, and cell-deposits in the finer membranes.

(1) *Foci*.—These are the lesions whose resemblance to the skin spots attracted Fränkel's notice. They are spherical or oval, rather sharply demarcated from their surroundings, and mostly about 0.1 mm. in diameter, though often smaller. The places where they chiefly occur are, in order of preference, the deeper parts of the pons and medulla, the molecular layer of the cerebellar cortex, the basal ganglia, the cerebral cortex, and lastly the spinal cord; they are never found in the pia. In the brain they occur chiefly in the grey matter; there are not many in the white matter, and in the centrum ovale they are rare; they are occasionally seen in the white matter of the convolutions, but then usually impinge on the cortex. The foci in the cortex of the cerebrum lie mostly in the middle layers, and are fewer in the occipital than in other cortical regions. In a Nissl section

across a convolution one may often see, under a low power, several foci, prominent by reason of their numerous deeply-staining glia-nuclei. The focus is a proliferation of glia-cells, unaccompanied by any new formation of glia-fibres. In contrast with the skin lesions, the little vessel that runs into it never shows any necrosis and generally appears quite normal, though in old foci regressive changes in the intima can sometimes be detected. There is seldom any proliferation of vessel-wall elements and there are never any fibroblasts. In recently-formed foci leucocytes are sometimes seen, but most foci show neither leucocytes nor lymphocytes. The foci are essentially, and often purely, glial.

Along with those just described, foci of other forms are met with. In the more superficial parts of the cerebral and cerebellar cortex the foci may assume the form of rosettes, through the glia cells at the periphery of the focus being disposed radially; this peculiarity must be in some way dependent upon local conditions, yet in precisely similar situations foci of the ordinary form are not uncommon. Sometimes around a precapillary vessel glia-cells are arranged in a single or double layer upon the glial limiting membrane, so as to form a sort of rind about the adventitial space; such cells, being sometimes set radially, may give the focus a star-like appearance, somewhat resembling the rosettes, but smaller. Particularly interesting is a form of focus very common in the molecular layer of the cerebellar cortex, and termed by Spielmeyer a *Gliastrauchwerk*. In this variety the proliferated cells are not huddled together in a dense mass as in the ordinary foci, but are distributed much more loosely and over a wider area, with less well-defined limits. In Nissl sections the slender bodies of the cells composing such a focus show very plainly, because of their abundant chromophil dust; they are greatly elongated, mostly in directions perpendicular to the cortical surface, and their nuclei, likewise elongated, are sausage-shaped. The open texture of the *Strauchwerk* permits these "rod-shaped" cells (*Stäbchenzellen*), with their many delicate processes, to be easily studied, so that of their glial nature no doubt can remain, and for the same reason the vessels in these areas can be readily examined and shown to be normal.

(2) *Infiltrations around vessels in the substance of the brain and cord.*—Many of these infiltrations appear to be somehow related to the formation of the foci, for not only is it observed that in places where foci are abundant the vessels in general are conspicuous under a low power by reason of the massive infiltrations around them, but often one particular vessel—usually the stem from which the branch to the focus takes origin—has a specially pronounced infiltrate, and a like association is observed in places where foci and infiltrations are few. Yet, even where foci are few, the infiltrations are often (and this applies particularly to the cerebral cortex) pronounced and wide-spread. They are deposits, within the adventitial sheaths, of plasma-cells and lymphocytes; nowhere in the central nervous system are there any diffuse leucocytic infiltrations such as are common in the skin. On the small vessels in the brain one can see very clearly that the plasma-cells are derivatives of lymphocytes; one can observe not only the multiplication of the plasma-cells by mitosis, but their original development from lymphocytes.

(3) *Cell-deposits in the finer membranes.*—These consist, not of plasma-cells and lymphocytes, but of macrophages, developed from the lining cells of the meningeal lymph-spaces. Thus the deposits in the meninges are not analogous to those on the cortical vessels. The condition somewhat resembles the so-called “chronic meningitis” occurring in general paralysis and sleeping-sickness. (It may be noted that in some of these cases of spotted fever macrophages are found on vessels in the brain substance—not in the cortex, but in the basal ganglia and central white matter; here, as in the pia, they are derived from the resident mesoblastic cells of the locality.)

Slight diffuse degenerative changes are seen in the nervous parenchyma. The appearances of the nerve-cells resemble those in other severe infective or toxic general diseases, and are not more severe or wide-spread than might be expected from the severity of the illness as a whole. The nerve-cells are not to any appreciable extent beset with amoeboid glia cells.

The interest of Spielmeyer's observations lies not so much in their importance for the study of spotted fever as in the light they throw on the general pathology of the central nervous system, and particularly on the pathological anatomy of the brain cortex. In this disease many things are clear that cannot well be made out in such a condition as, for example, general paralysis. First, as to the genesis of the plasma-cells and the macrophages. Sometimes, even in spotted fever, as so often in other conditions, it is difficult to distinguish these two kinds of cells from one another; when agglomerated in a cramped space they come to look alike, because, of whichever kind they are, they are pressed together into the same polyhedral forms or are flattened like the cells of stratified epithelium; in the miniature lesions of this disease their totally distinct origins can be easily proved. Then, as regards the *Stäbchenzellen*. Nissl and Alzheimer originally regarded these as mesoblastic. Later (1912) Alzheimer announced that in general paralysis some of them at any rate were glial; and Achúcarro has demonstrated in cases of rabies the formation of glia-fibres on these cells; but in no condition can their glial nature be so clearly proved as in spotted fever. Further, as to the purely glial foci. It is here seen that a glia-cell proliferation can occur apart from any vascular lesion or cell exudation; *i.e.*, it need not have an inflammatory basis. Nor need it be a reaction to a decay of the nervous elements, for in spotted fever, in spite of the pronounced glia-cell proliferations, the nervous structures proper remain remarkably long preserved. Thus it is shown that a glia-cell proliferation can occur primarily and independently.

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*The Structural Brain Lesions of Dementia Præcox.* (*Amer. Journ. of Ins.*, October, 1920.) Gurd, Adeline E.

The writer analyses the histological findings in the brain of nineteen cases of dementia præcox. The duration of the psychosis, age of patient and cause of death are given in each case. The cases are divided roughly into three groups: (1) those dying in the acute stage of the disease, (2) those in whom the disease had lasted two to four