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A study of the lipin-content of the liver in two cases of pituitary dystrophy. (Preliminary report.)

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Studies of the lipins in the curious obesity characteristic of hypopituitarism have not as yet been made. In the case of two autopsies upon bodies showing this condition microchemical studies have been carried out by the writer.

One case was a boy of eighteen showing infantilism, obesity and loss of sight (dystrophia adiposo-genitalis). Died after attempted removal of pituitary neoplasm (adamantino-carcinoma); the second case was a man of 29 years, with loss of vision, staggering gait and disturbed mentality. Acromegalic symptoms with secondary hypopituitarism. Round-cell sarcoma of base of skull destroying a hypophysis adenoma.

Both bodies showed very marked post-mortem increase of temperature; the source of the heat-production apparently being localized in the panniculi and fatty livers.

Gross Appearances of the Fat.—Panniculi thick, in large coarse lobules; when first cut it was glistening, translucent, very firm and light buffy yellow in color. As it cooled it became more buff in color, opaque and very hard. The livers of both cases were large, mottled red and yellow, with fatty shine.

Microscopical.—Frozen sections examined optically showed the presence of numerous small anisotropic droplets in liver, adrenals, panniculi, intima of aorta, and elsewhere. In the liver the fine anisotropic droplets are chiefly in the central and midzonal regions. They are present also in a narrow border of preserved liver cells in the peripheral zone. Larger isotropic droplets are scattered irregularly through the lobule, usually occurring in groups. There is in both cases a peculiar necrosis of the inner portion of the peripheral zone (intra-peripheral necrosis).

Staining with *osmic acid* gives a pale gray tint to the fine anisotropic droplets, while the larger fat-drops stain a deep brown-black.

Sudan III stains the fine fat droplets a peculiar brownish red; while the larger fat droplets take a deep brick-red to a yellow or pale buff color.

Scharlach R stains the fine fat-droplets a brownish-red, the larger ones a deep bright red.

Nile-blue sulphate stains the majority of the fine droplets a pink or lavender color. The majority of the larger droplets stain red, some pink, some pink-violet, some purple, some deep blue.

Indophenol. No differential staining shown.

Benda's Method. Gave no differential reaction.

Stains for fatty acids and soaps negative.

Simple staining with hematoxylin and eosin showed a typical ground-glass appearance in the cells containing the fine fat droplets.

From these fat reactions it is evident that the livers of these two cases of dyspituitarism show an unusual lipin content. The presence of numerous anisotropic droplets, staining a lighter gray with osmic acid, brownish or yellowish-red with Sudan III or Scharlach R, and pale pink with Nile-blue sulphate, makes it very probable that these are cholesterol-esters. Other lipoids may be mixed with these or with the glycerin-esters. The lipin combination may be very complex. Our staining methods do not satisfactorily differentiate these. They permit us to say, however, that these fatty changes are not those of ordinary fatty infiltration, but represent a mixed glycerin-ester and cholesterol-ester lipoidosis. It is evident that many of the liver cells contain cholesterol. Whether lecithin is present it is impossible to say.

This cholesterol lipoidosis was not confined to the liver, but occurs to a marked degree in the adrenals, and to a lesser degree in the panniculi and other organs and tissues (aorta, spleen, etc.). In pituitary dystrophia there occurs, therefore, a peculiar abnormal lipin metabolism characterized by cholesterol infiltration or retention (cholesterol steatosis). The condition may then be compared to the cholesterol infiltrations obtained by overfeeding with cholesterol, to the lipoidosis of diabetic lipoidaemia and that of Gaucher's disease.

In addition the liver shows a peculiar intraperipheral zonal

necrosis differing from previously described liver-necrosis. With this necrosis there is associated a fibro-blastic proliferation giving the picture of an early intralobular cirrhosis.

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**The comparative effect of adrenalin on the pupil and blood pressure
in cats and rabbits.**

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Several years ago Meltzer showed that there was a striking difference in the response of rabbits and cats to instillation of adrenalin in the eye after excision of the superior cervical ganglion. Whereas in rabbits full dilatation was obtained by a single instillation, in cats it was obtained inconstantly and only after very numerous instillations.

In order to determine whether this difference in behavior was due to a difference in the susceptibility of the iris in the two species to adrenalin, I gave this by intravenous injection and made a quantitative study of the iris on both the normal and gangliectomized sides. I found that contrary to expectation, the iris of the cat was much more sensitive than that of the rabbit both in the intact and gangliectomized eye. Whereas 0.1 mg. per kilo, caused in the rabbit only slight dilatation of the normal pupil, this dose caused maximal dilatation in the normal pupil of the cat. On the gangliectomized side 0.01 mg. per kilo which had very little effect in the rabbit, caused almost maximal dilatation in the cat.

It was noted however that the duration differed in the opposite direction, being much greater in the rabbit. Thus a dose of 0.1 mg. per kilo, which caused dilatation lasting half an hour in the gangliectomized cat's pupil, caused dilatation lasting more than three hours in the rabbit. Smaller doses showed a similar relation.

In order to determine whether this relationship is true of smooth muscle in general or is limited to the iris, I studied the rise of blood pressure in the two species. The results showed that