being no degeneration in these stria nor in the corpus trapezoideum, shows that the cochlear nucleus was not damaged. Our own work, as well as that of others, show that the passage of the needle through the cerebellum could not be responsible for any of the degeneration in the medial longitudinal fasciculus. Even extensive cerebellar injuries produce no degeneration in this tract. Yet with lesions at the point described and slightly lower but well within the limits of the vestibular nuclei and certainly not directly involving the reticular formation, as generally mapped out in atlases, there may be as much or even more descending degeneration in the medial longitudinal fasciculus of the same side as in the one on the opposite side. The direct fibers are situated more dorsally and laterally than the crossed fibers in the cross-section area of these fasciculi. These fibers extend well into the spinal cord. Since there is no descending degeneration in the medial longitudinal fasciculus after lesions strictly limited to the lateral vestibular nucleus, we conclude that the medial vestibular nucleus or its continuation, the descending nucleus, give origin both to crossed and direct descending spinal fibers via the medial longitudinal fasciculus. Lesions too high in the medial nucleus produce crossed degeneration only.

The only possibility of misinterpretation that we can think of is in connection with the blood supply to the adjacent reticular formation, which might have been interfered with sufficiently by the lesion to have caused degeneration of cells outside of the vestibular nuclei, although there is no evidence of such vascular disturbance.

## 4963

## Sugar in 0.02 cc. Blood by the Method of Folin and Malmros.

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The method of Folin and Malmros[1] permits of drawing a second sample of the protein-free blood centrifugate in order to duplicate the determination. In the training of assistants, I have taken advantage of this in order to check their technique but in no case was an absolute check obtained. On trying it myself I did not get an

[1] Folin and Malmros, *J. Biol. Chem.*, 1929, lxxxiii, 115.

absolute check. The reason for this discrepancy may be that sufficient time was not allowed for a diffusion-equilibrium of the sugar between the precipitate and the centrifugate with consequent continuation of the diffusion during the centrifuging and difference in the concentration of the upper and lower part of the centrifuge tube. Another possible cause for the variation is the destruction of sugar in the centrifugate with time, as some of these checks were made 6 or more hours later. Another source of error is in the time taken for making the readings. The 2 solutions of prussian blue, 1 of the blood centrifugate and the other of the standard sugar solution, change on standing and the rate of change is not the same in the 2 solutions. Therefore, one must work rapidly in making the readings. Since the above method of check does not check the technique of measuring the blood sample and since 2 samples of 0.1 cc. of blood can not be taken out of the same drop from the cut finger and since successive drops may vary in sugar content, we have reduced the quantity to one-fifth. Our technique is as follows: using B. & L. apparatus, including the blood pipette made for the hemoglobin determination:

Measure 0.02 cc. of blood and blow it into 2 cc. of tungstic acid solution contained in a 5 cc. test-tube. Rinse the pipette by sucking and blowing and keep the mixture stirred for one whole minute and centrifuge until clear. Transfer 1 cc. of the clear fluid with a dry pipette to a second tube, graduated at 5 cc. Rinse the same pipette with the standard sugar solution and transfer 1 cc. of the standard to another tube graduated at 5 cc. To the standard and unknown add 0.4 cc. of potassium-ferricyanide solution and 0.2 cc. of cyanide-carbonate solution. Heat to boiling for 8 min., cool in running water 1 min., add 1 cc. of ferric iron-ghatti solution, shake, and let stand 1 min. Then fill to the mark with $H_2O$, invert each tube once and pour the total of each tube into a dry flare-top cup of a "biological" colorimeter, placing the unknown on the left and set at 20 mm. Using daylight passed through a jar of potassium ferricyanide solution, make 10 readings as rapidly as possible.

The question arises whether one is able to measure as accurately in this apparatus as in the Folin apparatus, which is 5 times as large. It is a little difficult to check one method against the other unless 2 persons work at the same time, one with one method and one with the other method, owing to errors due to letting solutions stand. (The apparatus was calibrated by weighing water from the delivery pipettes in small weighing bottles and weighing the blood pipettes dry and then filled to the mark with water and dividing the differ-

ence in weight by 0.997. The 5 cc. graduated tubes were calibrated by means of a 5 cc. certified pipette.) By working rapidly it was possible to check the method of using 0.02 cc. with that using 0.1 cc. of blood, the former reading between 99 and 101% of the latter. We have found that the blood pipettes fill better if rinsed with distilled water and dried in an oven or by sucking air through, than by drying with alcohol and ether. This may be due to a film of adsorbed water on the pipettes rinsed last in water, or to a film of oil due to the alcohol and ether not being absolutely pure. The ferricyanide used as a color filter must be kept covered with an opaque box when not in use.

## 4964

## Studies of Skin Protection to Ultraviolet Light by Previous Irradiations.

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The amount of radiation from a mercury quartz arc required to produce an erythema of a certain skin area of a certain individual is, as a rule, greater the more this area has been exposed to ultraviolet light of wavelength 240 to 310 mμ (the region responsible for the reaction) during the previous 2 months. Evidently some change has been produced in the skin by the first irradiation which makes it less sensitive to the following exposure. What change is responsible for this protection is not definitely known, but it has been shown that it is a local change extending over the exposed area and slightly beyond the margin. It has also been proven that it does not run parallel to the tanning which is another effect produced by certain ultraviolet light bands between 240 and 370 mμ.[1]

For treatments with ultraviolet light it is important to know when and to what extent such protection is produced. Some experiments along this line have been carried out by other investigators and we have attempted to check their measurements and to contribute some further details.[2]

[1] Uhlmann, E., *Strahlentherapie*, 1930, xxxv, 361.

[2] Schall, L., and Alius, H. J., *Strah.*, 1928, xxvii, 769. Linser, K., and Kropatch, A., *Strah.*, 1926, xxii, 514. Perthes, G., *Munchen Med. Wehschr.*, 1924, lxxi, 1301. Keller, P., *Strah.*, 1924, xvi,; 1928, xxviii, 152.