

ity. The apparatus was so arranged that a slow stream of dry oxygen was passed continuously over the surface of the oil during the exposure.

A twenty-four and sixty-six hour exposure to the oxidizing cod liver oil, made alkaline with 10 per cent potassium hydroxide, produced no darkening of the photographic plate. A seven-day exposure to the oil, untreated by alkali, also produced no effect. These results gave no evidence that cod liver oil, while oxidizing, emits ultraviolet light. That oxidation of the oil plays no part in its action as an antirachitic factor would be expected from the findings of McCollum, Simmonds, Becker, and Shipley² that, when air is bubbled through cod liver oil heated to 100° for 10 to 20 hours, vitamin A is destroyed, but the oil is still as effective as the untreated oil in curing rickets.

267 (2790)

The mercury combining power of deproteinized blood.

By PHILIP S. HENCH and MARTHA ALDRICH

[From the Division of Medicine, Mayo Clinic and the Mayo Foundation, Rochester, Minnesota.]

In the study of renal function, simple methods that give clinically accurate data are desirable, particularly to the physician to whom the more complicated blood analyses are not available. The salivary urea index, recently described,¹ is such a method. This test is based on the principle that urea is present in the saliva in definite concentrations depending on the amount in the blood. The salivary urea increases with urea retention in the body. The degree of urea retention can be estimated clinically by the simple measurement of the mercury combining power of the saliva quite as satisfactorily as by the more elaborate blood urea determination.

Since our study of the mercury combining power of saliva and the development of the salivary urea index, we have modified the

² McCollum, E. V., Simmonds, N., Becker, J. E., and Shipley, P. G., *Bull. Johns Hopkins Hosp.*, 1922, xxxi, 221.

¹ Hench, P. S., and Aldrich, Martha, *J. Am. Med. Assn.*, 1923, lxxxi, 1997.

technic so that the same simple test may be applied directly to the blood. An index of the non-protein nitrogen and the urea of the blood is thus easily and quite rapidly available.

TECHNIC.

To 10 per cent trichloroacetic acid in a centrifuge tube is added an equal amount of oxylated whole blood, preferably 5 cc. of each, and this is centrifuged for four to five minutes. If a centrifuge is not available, the mixture may be filtered, but it may be necessary to use 6 or 7 cc. of blood to obtain sufficient filtrate for the test. On this protein-free filtrate (preferably 5 cc.) is performed the test for the mercury combining power with 5 per cent mercuric chlorid, identically as described for the estimation of the salivary urea index. That is, to the filtrate is added by titration 5 per cent mercuric chlorid until there is a slight excess, as indicated by the appearance of the first faint tinge of brown within three seconds when a test drop is added to a drop of saturated sodium carbonate on a spot-plate.

This procedure may be done with the apparatus² used to estimate the salivary urea index (in which case the figures on the index tube should be multiplied by two), or it may be conveniently carried out in the common graduated centrifuge tube. To the filtrate, mercuric chlorid is added until the end point is reached, and the amount used is read directly from the graduations of the tube. The titration value of the 5 cc. filtrate is multiplied by forty to obtain the mercury combining power of 100 cc. of deproteinized blood.

APPLICATION OF THE TEST

The test was applied to blood obtained from dogs in whom experimental uremia was induced by the administration of urea and by ureteral ligation. It was also performed on samples of human blood. There was throughout a definite parallelism between the mercury combining power of the blood and the non-protein nitrogen substances, chiefly urea. The normal mercury combining power of deproteinized blood is from 70 to 100 cc. of 5 per cent mercuric chlorid. When the nonprotein nitrogen or the urea of the blood was elevated, the mercury combining power also rose. For example, in a sample of blood in which there was

² Hench, P. S., and Aldrich, Martha, *J. Am. Med. Assn.*, 1924, lxxxii, 1194.

480 mg. urea for each 100 cc. the mercury combining power was 500 cc.

From this test, which may be made in fifteen minutes, with a minimal laboratory equipment, may be determined accurately the absence or presence of nitrogenous retention in the body, and the degree of such retention.

268 (2791)

A smoke precipitator used in iodine analysis of food stuffs.

By J. F. McCLENDON.

[From the Laboratory of Physiological Chemistry, University of Minnesota, Minneapolis, Minn.]

Owing to high potentials needed for the Cottrell Precipitator, and the danger of short circuiting when manipulating the rest of the apparatus, it was decided to try another method of smoke precipitation in the combustion of large samples of food stuffs in the combustion tube, the smoke being passed through an alkaline solution to catch all the iodine. It is very difficult to catch the smoke in wash bottles, in fact it is stated that phosphorus pentoxide dust may be blown through a washbottle without complete precipitation.

The method tried was as follows: The smoke was bubbled through distilled water, this somewhat cooling it and saturating it with moisture at 100°. Its further passage supersaturated it with moisture which caused each smoke particle to be surrounded by a layer of moisture. The precipitation apparatus was a glass tube 7 cm. in diameter and 45 cm. long, closed at one end by fusing the glass, closed at the other end with a rubber stopper, and provided with a side neck 1½ cm. in diameter. By means of holes in the rubber stopper two block tin tubes 1½ cm. in diameter were inserted. One of these tubes was open at the inner end and admitted the hot smoke which passed through the full length of the tin tube (keeping it hot), and then was admitted to the interior of the glass tube, and finally passed out the side neck. The other tin tube was closed at the inner end, and in it was inserted a ½ cm. tube admitting water and keeping it cool. The