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Determination of carbon monoxide in blood.

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The blood is treated as in the determination of oxygen by Van Slyke's method.[1] A mixture of gases consisting of oxygen, carbon monoxide and the slight amount of nitrogen gas held in solution in the blood, is obtained. The extraction of the gases must be continued for a somewhat longer time than the one minute which is sufficient when oxygen alone is bound by the hemoglobin, otherwise the technique is the same. After the gases are measured, the oxygen is absorbed by permitting 1 or 2 c.c. of alkaline pyrogallol solution to flow slowly into the chamber of the apparatus from the cup at the top. The residual gas, corrected for the 0.009 c.c. of nitrogen gas per c.c. of blood known to be present, is the carbon monoxide.

80 (1455)

Titration of organic acids in urine.

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Carbonates and phosphates are removed by adding 2 grams of calcium hydroxide to 100 c.c. of urine, and filtering after 10 minutes. 25 c.c. of the filtrate is brought to a pH of approximately 8 by adding 0.2 N HCl with phenolphthalein as indicator, till the pink color disappears. Then 5 c.c. of 0.02 per cent. Tropeolin 00 solution are added, and the solution is titrated to a pH of 2.7 with 0.2 N HCl, the volume being brought to approximately 50 c.c. by addition of water towards the end of the titration. The color is compared with that of 50 c.c. of a control solution with

[1] *Jour. Biol. Chem.*, 1918, xxxiii., p. 127.

the same pH and indicator. The amount of 0.2 N HCl required to give the endpoint with a control in which water replaces the urine is subtracted. Of the organic acids known to be present in urine in quantitatively significant amounts, the titration measures from 93 to 100 per cent. of each. It also includes very weak bases, but apparently of this class of substances only creatine and creatinine are significant; they are titrated to nearly 100 per cent. The titration figure, corrected for the amounts of these two bases, represents the organic acids.

81 (1456)

Some significant chemical changes in the blood coincident with malignant tumors.

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With the view of ascertaining the systemic effect of malignant neoplasms upon the organism, a series of sixty cases of various types of malignancies have been studied and contrasted with benign tumors. The data accumulated comprise determinations of the uric acid, urea, creatinine, sugar, diastatic activity and carbon dioxide combining power of the blood; the phthalein excretion; the occurrence of proteinuria and casts; and the blood pressure.

Two thirds of our cases of malignancies present evidence of an impairment of kidney function. The appearance and progress of this renal insufficiency follows the order characteristic of interstitial nephritis, described by Myers and his co-workers. The nitrogenous waste product first to be retained is uric acid, later urea and finally creatinine, and paralleling the accumulation of these nitrogenous substances there was noted a drop in the carbon dioxide combining power of the blood. A hyperglycemia and an increased diastatic activity pointing to a lowered carbohydrate tolerance, were encountered only in those cases mani-