

heart and its relation to the thorax. If the results in these two human cases are corroborated repeatedly by similar findings in other instances, it is possible that the usually accepted electrocardiographic interpretation of right and left bundle branch block may have to be revised.

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Studies in pyrimidine metabolism.

By **D. WRIGHT WILSON** (by invitation).

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By partial hydrolysis of yeast nucleic acid, preparations containing pyrimidines as the only nitrogenous constituents were prepared and administered to rabbits. Uracil nucleoside when administered per os, subcutaneously or intraperitoneally caused an increased excretion of urea often much more than enough to account for the nitrogen administered. The undetermined nitrogen (the difference between the total nitrogen and the urea nitrogen) was always increased. A part of the increase in the undetermined nitrogen was due to the excretion of free uracil which was isolated in pure crystalline form. As much as 20 per cent. of the uracil fed as the nucleoside was recovered free in the urine.

When a mixture of cytosine and uracil nucleosides was administered to rabbits, there was an increased excretion of urea and usually no increase in the undetermined nitrogen. Uracil was isolated from the urine of one animal and was barely detected by a color reaction in another. No increase of creatine, creatinine, or purines was detected after feeding either preparation. Not even a color reaction for pyrimidines was obtained by using the same procedures on the urine obtained after feeding yeast nucleic acid.

Mendel and Myers were unable to find a trace of pyrimidine in the urine after feeding yeast nucleic acid but found that uracil, when fed, was excreted unchanged. Taken together, the data show that increasing quantities of uracil appear in the urine as simpler complexes containing the uracil group are fed. The con-

clusion may therefore be drawn (at least in respect to uracil), that, in the metabolism of yeast nucleic acid before the pyrimidine is liberated and even before the nucleoside is formed, the pyrimidine is altered in such a way that it may be further broken down and its nitrogen converted into urea.

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The variable acidity of hemoglobin and the distribution of chlorides in the blood.

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We have undertaken an investigation of the shift of chlorides between the serum and corpuscles of the blood described by Koeppé and by Hamburger, and have studied this phenomenon particularly in its relation to the heterogeneous acid-base equilibrium between hemoglobin, oxygen, carbon dioxide, bicarbonate, and the concentration of hydrogen ions.

Such a shift in chlorides may be easily produced, in vitro, by disturbing, in any way, the acid-base equilibrium, and is observed, under physiological conditions, between arterial and venous blood.

For the purposes of the investigation we have used fresh defibrinated ox blood, expelling the oxygen from combination with hemoglobin by first passing through carbon dioxide at 38° and then by boiling in vacuo at the same temperature. This can be accomplished with only very slight hemolysis. The blood has then been brought into equilibrium, at constant temperature and at atmospheric pressure, with various tensions of carbon dioxide, first in an atmosphere free from oxygen and then in an atmosphere with oxygen present at the tension at which it is present in atmospheric air. The whole blood has then been analyzed for oxygen and carbon dioxide, free and combined, and the serum, obtained by immediate centrifugalization under oil, analyzed for carbon dioxide and chlorides. The atmosphere