Silicon and phosphorus (half-periods, 2·5 min.) and phosphorus (half-period, 2·5 hr.) have been reported upon by Bjerge and Westcott[1]. They found a measurable activity only in the case of the 2·5 hr. period of phosphorus.

We have bombarded the following elements with our 2 m.e.v. neutrons for times up to twenty minutes in order to test for the shorter period activities: manganese and chromium (half-period, 3·75 min.), aluminium (10 min.), zinc (5 min.), silicon (2·3 min.). Any activity induced was certainly less than 1 per cent of the activity-value for phosphorus (2·5 hr.) irradiated to saturation under the same conditions.

Exposures for times up to three hours were carried out on zinc (half-period, 6 hr.), iron (2·5 hr.) and nickel (20 min.). No activities were found greater than 2 per cent of the saturation phosphorus value.

Calcium (16 hr.), magnesium and aluminium (15 hr.) were irradiated for periods up to six hours. Here again, our counter showed no activity as high as 2 per cent of that of phosphorus.

Naturally, any of these reactions might yield a positive result with a stronger source of neutrons or, in the case of the long-period ones, with a longer period of irradiation. We are making alterations which should greatly increase the number of neutrons available. Further investigations will be made on the above and other elements.

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[1] NATURE, **134**, 177 (1934).

Ultra-Violet Absorption Spectrum of Hæmoglobin

IN a previous communication (Adams[1] *et al.*, 1934) it was shown that the ultra-violet band at 4100 A., which is characteristic of hæmoglobin and its immediate derivatives, is not found in unlaked blood. This observation has been extended to several species and confirmed in all cases.

It has been found that the difference in physical state is not responsible for the absence of the band when the hæmoglobin is in the corpuscle. The cell volume was varied by placing the cells in solutions of different osmotic strength, but not more than 5 per cent variation in light absorption was observed. Precipitation of the hæmoglobin with a protective colloid gave a suspension of hæmoglobin with a density about equal to that of a blood corpuscle suspension. This preparation, although similar in physical properties to a cell suspension, displayed the same ultra-violet absorption spectrum as hæmoglobin in solution.

The explanation for the non-appearance of the band in the corpuscle was next sought in the possible combination of hæmoglobin with some constituent of the red blood cell to give a compound with no specific absorption at 4100 A. Attempts to combine cholesterol, lecithin, glutathione and lipid extracts of the cells with hæmoglobin did not yield substances which lacked the band at 4100 A. 'Stromatin', or stroma protein, was prepared by Jorpes' method[2] (1932). The pure protein does not exhibit any selective absorption in the 4000 A. region. However, if a small percentage of hæmoglobin or methæmoglobin remained as an impurity in the preparation, the hæmoglobin band was absent.

This suggested a combination between hæmoglobin and stromatin to give a substance with no absorption at 4000 A. A small amount of pure stromatin was mixed with dilute hæmoglobin in alkaline solution. The spectrogram was taken at once, and at regular intervals for several hours afterwards. The mixture was kept at 37° C. The results show that, after heating at this temperature for 30 minutes, the ultra-violet band of hæmoglobin began to disappear, and at the end of one and a half hours there was no trace of selective absorption at 4100 A. The experiment was controlled by treating hæmoglobin with the same amount of alkali in a similar way.

The results of these experiments lead to the conclusion that neither the crude lipids of the red blood cell, cholesterol, lecithin, or glutathione react with hæmoglobin in such a way as to change the specific absorption of hæmoglobin in the region of 4100–4200 A. On the other hand, pure stromatin does react with hæmoglobin to cause the disappearance of its specific band at 4100–4200 A.; and it is suggested that this same combination exists in the red blood cell, and is responsible for the lack of the specific absorption band in corpuscle hæmoglobin. Such an entity is apparently quite labile, since hæmolysis by a wide variety of agents causes the breakdown of the substance.

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[1] G. A. Adams, R. C. Bradley and A. B. Macallum, *Biochem. J.*, **28**, No. 2, 482–485 (1934)
[2] E. Jorpes, *Biochem. J.*, **26**, No. 2, 1488 (1932).

Potassium in the Brain in Vitamin B_1 Deficiency

IT has been stated that there is increased amount of potassium in the brains of pigeons suffering from vitamin B_1 deficiency. In view of the general interest attached to potassium salts and phenomena of excitation, I have re-examined this question. Unfortunately, I cannot find any significant difference between the amounts of potassium in the brains of normal and vitamin B_1 deficient pigeons, the values being 3·6 mgm. per gram of tissue in each case. The changes obtained by these authors[1] cannot, therefore, have been due to the avitaminosis.

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[1] Ballif and Gherscovici, *C. R. Biologie*, **115**, 75 (1934).

Kinetics of an Inverse Diene Synthesis in the Pure Liquid State

THE decomposition of di*cyclo*pentadiene into *cyclo*pentadiene is an inverse diene synthesis. It was found previously[1] that in paraffin solution the reaction is monomolecular and that the rate constant is given by $k = 6{\cdot}0 \times 10^{12}\, e^{-34000/RT}$ sec.$^{-1}$.

The rate of the decomposition has now been measured in the pure liquid state, using a method by which the *cyclo*pentadiene was continuously removed from the reaction mixture. Measurements have been carried out between 100° and 155°, and within this range the Arrhenius equation is obeyed. The value