

diameter and voltage. The similarity between this result and my empirical equation²

$$\lambda_0 = 3.6 \times 10^3 d_a / V_a^{1/2}$$

leaves little doubt as to the identity of the two 'types' of oscillation.

In an attempt to carry the multiple-segment anode construction to its logical conclusion, a 'squirrel-cage' anode system was tried some time ago in these Laboratories. In this, successive bars were connected to opposite sides of the oscillatory circuit. The performance was, however, much less encouraging than that quoted by Dr. Posthumus for his four-segment valves, possibly due to the filament being too well centred in the anode.

E. C. S. MEGAW.

Research Laboratories of the
General Electric Company, Ltd.,
Wembley.
Aug. 7.

¹ NATURE, 134, 179, Aug. 4, 1934.

² J. Inst. Elec. Eng., 72, 326, 1933.

³ Megaw, NATURE, 132, 854, Dec. 2, 1933.

Rôle of Insulin in Peripheral Metabolism

PREVIOUS efforts to ascertain the mechanism of insulin have indicated that it is in the peripheral metabolism. We have been investigating its focal point in the respiratory cycle of the cell and the peripheral metabolism of the carbohydrates.

The method employed was to utilise the effect of substances which have been previously used as inhibitors of respiration (ethyl urethane and cyanides) and sodium fluoride and iodoacetic acid, which latter affect the carbohydrate metabolism and have been used in the study of glycolysis in yeast and muscle extracts. Maximum tolerated doses of these compounds have been administered to rabbits, and their relative effect studied upon the action of insulin in doses of 1 unit per 2 kgm. weight of the animal.

The hyperglycaemic effect of narcotics, cyanides and iodoacetic acid have been reported by others. We have found that sodium fluoride likewise produces a hyperglycaemia, and we have based our conclusions on the assumption that the hyperglycaemia in these cases is largely due to their antagonistic action at the periphery rather than solely to the deglycogenation of the liver. In confirmation of this view, we have found that the standard unit of insulin used will render an animal hypoglycaemic to the point of convulsions if the hyperglycaemia is due to deglycogenation of the liver, where the peripheral metabolism is intact.

Our results indicate that the insulin mechanism is largely concerned with the reaction between α -glycero-phosphoric acid and pyruvic acid, resulting in the formation of lactic acid. Embden's scheme¹ has been used as the basis of the intermediary metabolism in the tissues.

This communication is in the nature of a preliminary report, and we are applying these results to the study of insulin action in muscle strips.

N. B. LAUGHTON.

A. BRUCE MACALLUM.

University of Western Ontario,
London,
Ontario.
July 30.

¹ Ann. Rep. Chem. Soc., 30, 331.

Intensity of the Cosmic Ultra-Radiation in the Stratosphere with the Tube-Counter

ON July 24 we succeeded in sending up a Geiger-Muller tube counter by registering balloons into the stratosphere to a height of 28 km. The sensitivity of the tube counter was the same for rays from all directions. The apparatus was protected against the low air temperature in the stratosphere in the same way as previously described¹ by a case of 'Cellophane', so well that the lowest temperature at the greatest height was +17° C. Therefore there was no influence of the temperature on the counting device. The indications of pressure, temperature and counting apparatus were recorded by a photographic plate every four minutes.

It is remarkable that the curve of impulses obtained with the tube counter is in shape identically the same as that obtained by the ionisation chamber; especially at heights above 18 km., there is no increase of the number of impulses. From these results we may conclude that the specific ionisation power of the ultra-radiation is practically the same for the whole region investigated from the surface of the earth up to 28 km. We found that the specific ionisation cannot be greater than 103 pairs of ions per cm.

A more detailed report of the investigations will be published shortly in *Physikalische Zeitschrift*. We wish to thank the Notgemeinschaft der deutschen Wissenschaft for providing the means that enabled us to make these investigations.

ERICH REGENER,
GEORG PFOTZER.

Physikalisches Institut der
Technischen Hochschule,
Stuttgart.

¹ NATURE, 133, 364, Sept. 3, 1933.

Speed of a Golden Eagle's Flight

ON the evening of July 24 I had the opportunity of measuring the speed of an eagle's flight with greater accuracy than is usually possible. From my house I was gazing at the several summits of An Teallach (3,483 ft. and three miles away) through a stalking telescope. I noticed an eagle in the air above Sail Liath (3,150 ft.). The eagle's flight was irregular and on more careful scrutiny it was possible to see two peregrine falcons stooping at her. The eagle soared to about 5,000 ft., coming nearer, and from an undetermined position made a downward sweep across the glen and out of sight on Meall an Duibha behind my house. The peregrines followed but were left behind. The time taken on this downward flight was about one minute and the distance approximately three miles.

This observation is almost worthless in itself, but half an hour afterwards I was walking to my weather station at 1,000 ft. on Meall an Duibha, immediately behind the house. At this altitude, the eagle rose from the ground about three hundred yards in front of me and the peregrines followed. I glanced at my watch, taking the position of the seconds and minutes hands. The eagle soared and I focused my glass. She reached a height which I could not estimate with certainty, but was probably 4,000 ft. The peregrines were still stooping but never actually struck. Having reached her height, the eagle made another sweep and I was able to see her land on one