For quantitative purposes it would seem more satisfactory to use fat containing deuterium rather than elaidic acid, which is less easy to estimate and is not a natural fatty acid. There is also the possibility that, in the body, elaidic acid may revert to its isomeric form and thus be undetectable. The use of deuterium as an indicator of fat transport has also recently been described by Schoenheimer and Rittenberg[2]. They have, however, made only a general survey and shown that fat containing deuterium when given in food may afterwards be found both in the 'body fat' and the 'organ fat'. It is proposed to continue the experiments in order to get a more accurate picture of the rate of entry of food fat into the lipines of different organs and tissues.

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[1] *J. Biol. Chem.*, **111**, 515 (1935).
[2] *J. Biol. Chem.*, **111**, 163 (1935).

Anomalous Absorption of β-Rays

DURING the course of some experiments with a beam of fast β-rays between 1,500 ekv. and 3,000 ekv. passing through an expansion chamber filled with nitrogen at atmospheric pressure and placed in a magnetic field of about 500 gauss, it was frequently noticed that particles with a normal range in air of the order of 10 m. or more were stopped in a single collision in the gas of the chamber, and lost almost all their energy by passing it on to some non-ionising particle.

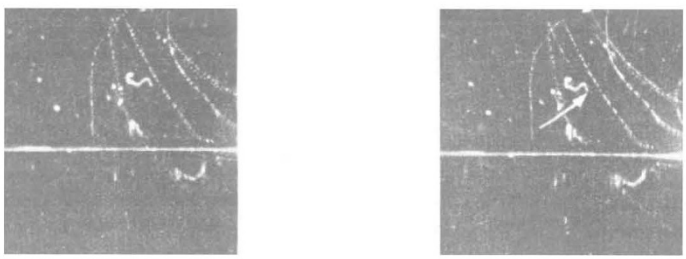

FIG. 1.

An example of this is illustrated in Fig. 1. The non-elastic collision resulting in the absorption of nearly the whole of the energy of the primary particle takes place at the point marked by an arrow. In such cases a characteristic branching at the end of the path can be observed. This is the track of a comparatively slow electron with an energy of 10–20 ekv. which, in this and similar cases, recoils in a backward direction.

The total length of the path of the electronic beam amounts to about 250 metres in nitrogen. The above phenomenon occurs not less than once in every 50 m. of path, and its probability may even be three times as great. The effective cross-section in nitrogen is therefore not less than 5×10^{-24} cm.^{2}.

Serious difficulties are encountered in interpreting this phenomenon. At first, one might be inclined to connect it with a radiative loss of energy. However, the observed value of the effective cross-section exceeds some hundred-fold the corresponding theoretical value as deduced from Bethe and Heitler's data. In addition, and apart from any theoretical calculations, a cross-section of this order in nitrogen would require an excessively great output of the 'stopping' radiation (*Bremsstrahlung*).

In such radiation processes, the effective cross-section should be proportional to Z^2. $\sigma_N = 5 \times 10^{-24}$ cm.^{2} in nitrogen corresponds to $\sigma_{Pb} = 7 \times 10^{-22}$ cm.^{2} in lead. If we assume that this is the mean value of the effective cross-section in the case of complete loss of energy by a β-particle with a velocity ranging from 1,500 ekv. to 3,000 ekv., then it can easily be shown that the absorption in lead of a beam of β-particles with an initial energy of 3,000 ekv. should be accompanied by a hundred per cent yield of photons with an energy between 1,500 ekv. and 3,000 ekv. (In aluminium the corresponding yield would be forty per cent.)

Very little is known about the 'stopping' radiation (*Bremsstrahlung*) at these velocities. So far as can be judged from the data available, however, a yield of the given value is quite out of the question. On the other hand, the photographs obtained leave no doubt as to the existence of the phenomenon itself. The question arises, therefore, whether in these absorption processes we are not dealing with a non-conservation of energy, as in the case of β-ray emission; that is, whether the neutrino does not play a part in these processes, in spite of the fact that this does not follow from the theory of β-disintegration.

It should be added that the scattering of β-rays is also markedly anomalous. The study of the scattering likewise indicates the existence of a new kind of interaction between the light charged particles and the nuclear field which is not accounted for in any of the existing theories.

We intend to publish shortly the numerical data obtained. Here we wish to direct attention to one more fact. The β-rays were also passed through some aluminium and lead plates in the expansion chamber. On comparing the scattering in the gas and in the plates, it was easy to see that, for large angles, the scattering does not follow the Z^2-law, but depends on Z to a far less marked degree.

The results of these investigations were reported in May last to the Academy of Sciences of the U.S.S.R. Leprince-Ringuet[1] has recently published similar results obtained in an argon-filled expansion chamber.

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[1] L. Leprince-Ringuet, *C.R.*, **201**, 712, 1524 (1935).

Motion of Liquid around an Obstacle during Electro-Deposition

DURING the electro-deposition of copper, it has been observed that if a plate cathode is caused to move at certain steady speeds through the electrolyte so that the latter is flowing across its surface, the copper is sometimes deposited in marked ridges along the lines of flow of the liquid. This is obviously due