It may be noted that for ages as great as those of the meteorites, $\sim 4 \cdot 5 \times 10^9$ years, there is a more noticeable discrepancy between α- and β-ages. Thus for the case of the meteorites there may be a better chance to confirm or reject the hypothesis of a varying weak interaction constant. Unfortunately, because of the discordance between lead–lead[8] and uranium–lead[9] ages of meteorites, there is reasonable doubt about the accuracy of the ages based on lead ratios. Also, because of the spread in ages obtained from the potassium-40–argon-40 method[10,11], there is reason for believing that some argon has been lost. This throws this determination somewhat in doubt. The strontium-87–rubidium-87 determinations[12] are few and may not have the necessary reliability.

It is concluded that there is no present evidence sufficiently reliable to rule out a variation with time in the β-decay rate.

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The De Haas–Van Alphen Effect in Copper

The de Haas – van Alphen effect in copper has been observed in a whisker made by the Brenner method[1] and oriented with the [111] axis along the field (see Fig. 1); the period is about $1 \cdot 7 \times 10^{-9}$ gauss^{-1}, which is close to the value for a free electron sphere of one electron/atom and not inconsistent with the Fermi surface proposed by Pippard[2]; the effective electron mass as estimated from the temperature variation of the effect is about 1·3 times the free electron mass.

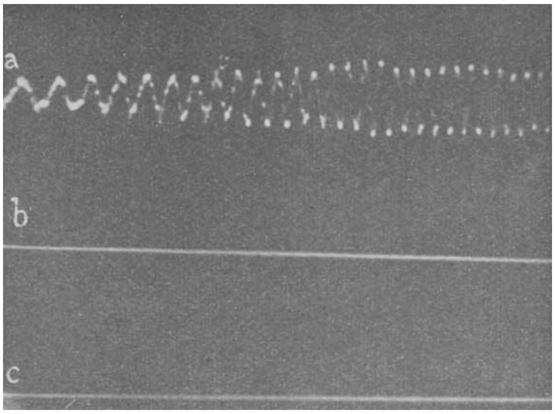

Fig. 1. Trace *a* shows the amplified output from a pick-up coil containing the [111] whisker at 1·1° K. in a magnetic field *H* of about 72,000 gauss, which drops by about 250 gauss across the picture during a time of sweep of about 0·6 msec. This drop is indicated by the slight decrease of separation between traces *b* and *c*, which is a measure of the variation of (H − 67,000) gauss. The shortening of the interval occupied by each successive period is due to the increasing rate of decrease of the magnetic field from left to right

Previous negative results[3,4] may have been due to (*a*) crystal imperfections, (*b*) eddy currents associated with the impulsive field, (*c*) non-occurrence of the effect in certain crystal directions. Copper whiskers are usually very well oriented along one of the principal crystal directions and are of good quality as crystals; thus they are particularly favourable as regards (*a*), since the influence of a given degree of imperfection is least along a direction of symmetry. Moreover, a whisker provides in a natural way a very thin crystal wire and thus helps as regards (*b*); the diameter of the whisker used was about 0·2 mm. It is interesting to note that three other whiskers, two oriented along [100] and one along [110], showed no de Haas – van Alphen effect; this may well be merely because of inadequate sensitivity (in the successful observation the oscillations had only about ten times the noise amplitude), but it is possible that the magneto-resistance effect is particularly high for the [111] direction[5–7] and not for the other directions, thus making the [111] whisker particularly favourable as regards reducing eddy currents.

The discovery of a positive effect in copper removes the suspicion that the earlier negative results in monovalent metals may have been due to fundamental rather than technical reasons, and thus opens the way to a detailed investigation of the electronic structure of these metals.

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Crystal Structure of Foshagite ($Ca_4Si_3O_9(OH)_2$)

We have recently made some predictions about the crystal structure of foshagite, based on a study of the dehydration process at 700° C. together with electron diffraction and X-ray fibre evidence[1]. There were strong indications that the structure consists of calcium and hydroxyl ions, and metasilicate chains resembling those in wollastonite[2], and the approximate positions of the calcium ions were suggested. A complete trial structure is now postulated, and more detailed consideration of the X-ray evidence shows that it is essentially correct.

The structure is shown in Fig. 1 with that of para-wollastonite (monoclinic β-monocalcium silicate) for