

not previously anticipated; but further experiments are required to confirm the result obtained before drawing the important conclusions it appears to warrant.

It is hoped to repeat this experiment and others at Spitsbergen in the future; but it is desirable that other workers more favourably situated should also carry out similar experiments extending over a longer period.

The actual outlay of expenses for the experiment in 1921 was borne by the Marine Biological Association, and in 1922 by a Government Grant from the Royal Society, but in both years essential help was provided by the Scottish Spitsbergen Syndicate and its scientific leader, Mr. J. Mathieson.

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December 15.

Separation of Mercury into Isotopes in a Steel Apparatus.

By 305 hours of repeated fractional vaporisation from a steel trough in a vacuum at low pressures we have obtained a difference of 0.1 unit in the atomic weight of mercury without other cooling than that given by ice. The trough holds 190 c.c. of mercury, but another larger apparatus has been constructed in which the capacity is 10 kilos. In this the mercury

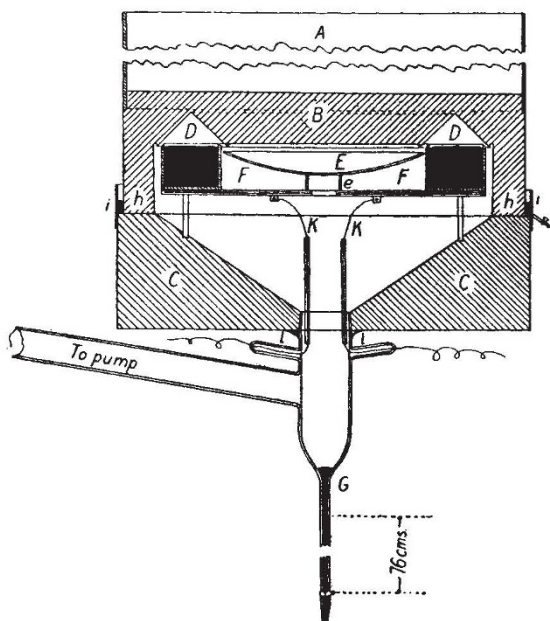


FIG. 1.—Steel apparatus for the separation of mercury into isotopes by vaporisation. *A*, Cylinder for ice; *B*, circular condensing roof, made of steel; *CC*, drain for the light fraction, made of steel; *DD*, annular steel trough holding 190 c.c. of mercury; *E*, watch glass with hole in centre, supported on a short glass tube *e*; *FF*, heating element made of calorisred wire and supported on glass rods; *G*, collecting tube made of glass; *hh*, ground joint; *ii*, mercury seal; *KK*, platinum wires; *ll*, ground joint and sealing wax.

is heated by an insulated wire which lies in the bottom of the trough, the insulation being obtained by a coating of magnesium oxide, which is covered with a steel sheath. This wire is produced by the General Electric Company.

The details of the apparatus are exhibited in Fig. 1. By means of the tube *G* the sample may be divided into as many fractions as is desired. In the newer form of apparatus the wires used as leads to the heating coil pass through insulators in the bottom

steel plate, and not through the upper part of the tube *G*. The principle of the apparatus is that the lighter molecules, which vaporise more rapidly, strike the slanting roof above *D*, and collect in drops. These drops do not fall back into the trough of mercury, but roll down the slanting ceiling until they reach its edge, when they drop into the inverted cone in the lower steel plate, and then into the glass tube *G*, which has a capillary of 800 mm. length at the lower end.

The progress of the separation was followed by the use of Fig. 2, due to Mulliken and Harkins, and it was

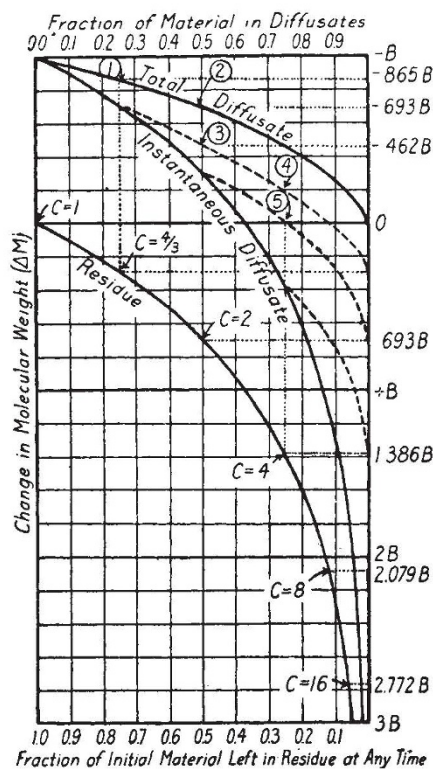


FIG. 2.—Generalised diagram showing atomic or molecular weight of fractions obtained during a 100 per cent. efficient diffusion or irreversible evaporation of a mixture of isotopes.

found that the efficiency of the process is quite constant and equal to about eighty per cent. It may be stated that Dr. Mulliken is also separating the isotopes of mercury in this laboratory, using the method of evaporative diffusion, which has an extremely high efficiency. His results will be reported separately. Our own work will be described more fully later, in the Journal of the American Chemical Society.

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December 22.

The Rule of Priority in Nomenclature.

As a teacher of palæontology and keeper of palæontological collections, I may perhaps be permitted to bring forward for discussion some trenchant points which seem to call for immediate action.

The rule of priority was originally intended to be a help in clearing away obscurity in nomenclature, but it is now seen that the strict observance of this rule is having a reverse effect.