(2) The figures [diagrams] show clearly that the all-important fact has been missed, namely, that the so-called aftershaft or byfeather consists not only of a few simple barbs but also of a distinct shaft.

(3) Perhaps it will save matters if we read: Some owls and some petrels have as thick and fluffy and long-lasting mesoptile coats as some penguins, relatively of course. For example, if some nestling feathers of the shearwater measure 24 + 26 = 50 mm. in length, this does not prevent large penguins from wearing still longer and longer-lasting coats; nor is it incompatible with some small petrels having mesoptiles (they vary much according to position) less than half an inch in length.

Perhaps some genius, not too much hampered by facts, may still discover a "law," or equation by which the palæontological dates of various groups of birds can be deduced from the relative emanations of their successive nestling coats. H. F. G.

The Atomic Weight of Mercury from Different Sources.

THE successful accomplishment of separating the isotopes of mercury (NATURE, 106, 144, 1920; *Phil. Mag.* 43, 31, 1922) suggested an investigation to determine the extent to which samples of mercury from different sources might show the same atomic weight, *i.e.* the same density, which is to be expected only if the various minerals contain the isotopes in the same ratio.

Mercury obtained from the following minerals was investigated:—

	Mineral.	Geological Period.
1.	Cinnabar from Almaden (Spain)	Silurian.
2.	,, ,, Phalz (Germany)	Permian.
3.	,, ,, Idria (Dalmatia)	Triassic.
4.	,, ,, California (U.S.A.)	Cretaceous.
5.	,, ,, Santafiora (Italy)	Eocene.
6.	,, ,, Ras-el-Mah (Tunis)	Upper Eocene.
7.	,, ,, Gölnicz (Hungary)	
8.	Calomel ,, Terlingua (U.S.A.)	Lower Cretaceous.
9.	Mercury oxychloride, Terlingua (U.S.A.)	Lower Cretaceous.
10.	Cinnabar, synthetic, unknown origin	

After reduction with iron and repeated distillation of the metal *in vacuo* the densities were measured by the method described in the previous communication. We found no difference in density exceeding the possible experimental error, which amounted to 2–6 in a million, corresponding to 0·0004–0·0012 in the atomic weight. Considering the very different geological and geographical origin of the mercury samples investigated we can conclude, with great probability, that the isotopic composition of mercury of terrestrial origin is the same.

The following numbers are the density data (d_4^0) found in the literature:—

13·5959 (Regnault, 1807).
13·5958 (G. de Metz, 1892).
13·5956 (Vincenti and Omodei, 1888).
13·5953 (Volkmann, 1881).
13·5938 (Marek, 1883).
13·5937 (Thiesen and Scheel, 1898).
13·5886 (Biot and Arago, 1816).

The considerable differences exhibited by several of these numbers do not exclude the possibility that mixtures of different isotopic composition were measured. From the above-mentioned investigation, however, we are justified in assuming the differences as most likely due to experimental errors.

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Physico-Chemical Laboratory of the Polytechnic High School, Copenhagen, May 12, 1922.

The English Ph.D.

SOME time ago I had the privilege of listening to addresses by the heads of two prominent English colleges on the provisions for the English Ph.D. Quite frankly it was stated that this degree is intended to satisfy students from the Dominions and the United States. It is manifestly unfair to give an American, for example, as a result of his study a degree, like M.A., which is of little or no value in his own land.

Two fundamental mistakes, however, have been made which endanger the value of the English Ph.D. Perhaps this can be made clear by considering the matter from a purely practical aspect. The American undergoes the expense of his work for the Ph.D. primarily because it helps him to a better post than he would otherwise get. If his degree does not help him to earn his living it has no more than a sentimental value. When applying for his post, his degree is weighed by the faculty and other authorities. It is *their* opinion that determines the character of the university work for the Ph.D.

These people require evidence that the candidate has received what *they* consider to be the best training. In the first place, his degree must be from a place where his subject is well taught. For a post in geology the degree from a university where geology is represented by a distinguished professor is a valid claim, whereas one from a university with a less able geologist is of lower value. The English universities must recognise that the value of their Ph.D. depends on the distinction of their teachers and not on their antiquity or fame.

The general intellectual training of the man is a second factor. His degree must mean that he is imbued by the spirit of scientific research derived through contact with the leading investigators. This implies immediately that for the particular departments which the university decides to develop the Ph.D. instruction, it must have professors of the first rank. A general all-round training, at least in the man's particular subject, is also demanded. This implies that the student must spend his time at different universities. The man who has worked in physiology under Sherrington, Bayliss, Starling, and Langley is a better-trained man than one who has spent his whole three years with only one of them. The English system, however, seems to deny or discourage the principle of migration. Unless something like the German system of free migration is developed the English degree can never have a value equal to the old German one.

It is not necessary to discuss certain other regulations; they will lapse by their own failure. For example, one university has proposed that the student shall choose his problem of investigation at the beginning of his three years and devote himself mainly to following it under the guidance of the professor. Such a process would turn out a narrow-minded monk, and not the all-sided man of science of wide views that is demanded. Most of the regulations proposed by the universities are aimed at keeping out unfitted students—quite proper but minor considerations. In none of the discussions that I have heard has there been any conception of the more important matter of providing for the proper development of the scientific investigator with the gift of presenting his results to the world. Yet this is just what the American universities demand from candidates for vacant posts. What these provisions must be I will not attempt to indicate. They can be discovered only by careful inquiry into the causes of the success of some universities and the stagnation of others. E. W. SCRIPTURE.