

my pet birds. But the growing merlins did not develop rickets, and it appears that the mother was 'aware' of the remedy, for from time to time she would bring in a victim entirely or partially feathered and feed mouthfuls of *feathers only* to all her offspring in turn. They quite evidently objected to it and regarded it as 'medicine,' for the mouthful invariably had to be thrust well down into the maw, and even then proved very difficult to swallow. Possibly it is true that there is nothing new under the sun, and we may here be witnessing a crude method of administering the antirachitic vitamin D that has, no doubt, been in practice for countless centuries.

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The Cause of Fishiness in Dairy Products.

THE action of Fenton's reagent (hydrogen peroxide in the presence of small amounts of ferrous salt) on lecithins in alcoholic solution causes the oxidation of the choline and amino-ethyl alcohol portions to trimethylamine and methylamine respectively (together with some ammonia).

The olein of butterfat, owing to its unsaturation, easily absorbs oxygen to form a labile peroxide, the absorption being strongly catalysed by compounds of heavy metals, especially those of copper. The peroxide thus formed is an active oxidising agent in fatty media and is also a catalyst to more advanced oxidation. Lecithin is intimately associated with the fat peroxide in the fat phase of dairy products, and its nitrogenous base portion is oxidised through the agencies of the fat peroxide and the catalytic activity of the metallic (copper) compounds present, forming volatile bases possessing a fishy odour. That is, the reaction involved is a modified Fenton reaction in the fat phase. These volatile bases (trimethylamine mostly), together with the easily hydrolysable salts of these bases with free fatty acids (butyric and oleic), are the causes of fishy flavours and smells in dairy products.

The importance of small amounts of metallic compounds, copper especially, in strongly catalysing the oxidation must be realised, since, without metallic contamination, the formation of labile peroxide would be slow, and, since rancidity is a precursor to fishiness, that degree of rancidity necessary for fishiness to develop would not have been reached during the normal storage of products free from metallic contamination. In the examination of all products which were fishy, copper in appreciable quantity has been found to be present.

That such oxidation is possible in butterfat also demonstrates the need of inquiry into the fate of fat-soluble vitamins during the development of rancidity.

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Feb. 7.

Nomenclature of Eruptive Rocks.

THE reviewer of my book "Eruptive Rocks" (NATURE, Dec. 17, 1927) says that I have not accomplished my expressed purpose of cleaning up "the jungle of rock names." The *wisdom* of my procedure is open to question, but the *facts* can be ascertained by simple enumeration. Prof. Arthur Holmes collected about 470 names of eruptive rocks in his "Nomenclature of Petrology," and the total number

in use at the present time is certainly not less than 500. Of these I have used only 56 in my system, a reduction of about 88 per cent. This seems to me to be a fairly thorough 'cleaning-up,' and I wonder what more the reviewer wants? Of course, I use some qualifying terms in conjunction with these names, but so does every petrologist, no matter what system he follows.

S. J. SHAND.

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Jan. 11.

PROF. SHAND has been led astray by his metaphor. He imagines that petrographic nomenclature is to be cleaned up by the simple process of chopping down names to the extent of 88 per cent. (as he claims), just as a jungle would be cleaned up by chopping down trees and clearing undergrowth. In denying that he has cleaned up the jungle of rock names I merely meant to imply, following his metaphor, that he has not, in my opinion, succeeded in his task of reforming petrographic nomenclature. I do not deny that he has eliminated, or attempted to eliminate, a large number of rock names, some desirable, others undesirable; but he has also added a number of fungoid growths such as per-, sub-, meta-, -oid, to the names he has spared, a procedure which, in my opinion, neither lessens the confusion nor contributes to the beauty of the nomenclatorial jungle.

It may further be questioned whether Prof. Shand has really cleaned up the jungle to the extent of 88 per cent. Of the 470 igneous rock names given in Holmes's "Nomenclature of Petrology," probably at least half have never been used more than once, and are, therefore, seeds that never took root.

THE REVIEWER.

Mammoths and Man in the Transvaal.

IN the supplement to NATURE of Dec. 10 is an interesting contribution by Prof. Dart on "Mammoths and Man in the Transvaal." The paper is valuable in directing attention to the importance of the Vaal River diamond gravel terraces, and the light which they will probably throw on early man in South Africa, and possibly on the wild animals associated with him. Whether Prof. Dart's conclusions are confirmed or not, the paper will result in more intensive work being done. Some of us who for years have been interested in the matter, have come to conclusions which differ from those of Prof. Dart.

Two years ago Miss Wilman, director of the Kimberley Museum, sent to Prof. Osborn, at my suggestion, two elephant teeth from the gravels of Barkly West. These Prof. Osborn determined as two species of *Archidiskodon*, one of which he regarded as a Middle Pliocene type and the other as an Upper Pliocene or Lower Pleistocene type. Three years ago I described the molar of an extinct giant pig from another gravel deposit. At present I have on hand four specimens collected by diggers, evidences of a huge extinct horse, and of a second type of large pig. All these teeth show some signs of being water worn, and if Prof. Osborn is right in regarding the elephant teeth as of Pliocene or Lower Pleistocene type, we must conclude, I think, that the teeth have been carried into the deposit from a much earlier one. If, as seems probable, Prof. Dart's *Archidiskodon* teeth are similar to those examined by Prof. Osborn, then it may be regarded as almost certain that they are very much older than the lowest gravels of the Vaal, which cannot be of great geological antiquity.

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