Letters to the Editor

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Egyptian Neolithic Barley

WHEN, where and with what species man first began the cultivation of grain are questions intimately bound up with the development of our civilisation. Fresh light has been thrown on these questions by specimens of grain which were found a few years ago in the course of explorations carried out in Egypt by Miss G. Caton-Thompson and Miss E. W. Gardner, who have given preliminary accounts of their work in two papers[1]. The archæological and geological evidence given in these papers shows that this grain was grown between 5,000 and 6,000 B.C. by a people in a Neolithic state of culture, living on the shores of a lake, which still exists, though now much smaller than in Neolithic times.

In the course of the work, more than a hundred small straw-lined pits were found which had served as granaries. Most were empty but several contained agricultural implements, and eight, varying quantities of grain, which, in five cases, was entirely or mainly wheat, but, in three, to a large extent barley.

The number of varieties of barley in cultivation is very great, amounting to several hundreds; these varieties or, at any rate, groups of them, are fairly well confined to different parts of the world. As my work during a good many years past has made me familiar with many of them, I thought it would be interesting to see how these ancient specimens compared with modern barleys; by the kindness of Miss Caton-Thompson, I have been able to do so.

Of the three specimens containing barley, one was found to be in a practically perfect state of preservation; some 800 corns were examined, with the following results:—

Wheat	.. .. ..	20 per cent
Barley (6-rowed)	..	57 ,,
,, (2-rowed)	..	23 ,,

As I have no special knowledge of the varieties of wheat, I did not examine this further but confined my attention to the barley, the characters of which were compared with those of modern barleys grown not only in Egypt but also in other Eastern countries, namely, Tunis, Syria, Danubian countries, Persia and India. The result of this comparison was to show that this prehistoric barley was to all intents and purposes identical with that in cultivation in Egypt at the present time and clearly distinguishable from the barleys now grown in the other countries mentioned.

These facts give rise naturally to the thought that, since no appreciable improvement can be seen to have taken place in it during the last seven thousand years, a very long time must have been needed for this barley to have developed from the wild state to the degree of perfection which this specimen shows; in other words, the origin of agriculture must have been long before 5,000 B.C.

The other evidence collected by Miss Caton-Thompson and Miss Gardner permits of a few more conclusions being drawn as to the part which cereals and their cultivation played in the lives of these people.

From the size of the pits and on the assumption that the contents of each pit were the produce of one area and the property of one family of, say, 5–10 persons, it is evident that these people were not essentially an agricultural folk, for the proportion of grain in their food supply was less than in modern England, whereas in truly agricultural populations like those of India or China, it is very much higher. Its cultivation must have made small demands upon their time, which must have been spent mainly in fowling and fishing. They were, therefore, a people in the interesting intermediate stage between hunting and agriculture, and it is significant that we find them on the borders of a lake, for the presence of water must have been a most important, if not the most important, factor in bringing about the difficult transition between hunting and agriculture. A hunter is essentially a wanderer; an agriculturist essentially a settler. Even if the brilliant idea of growing wild grass instead of merely gathering it did occur to a hunter, there would be little inducement for him to do so, for the game might move away at any time and he could never be sure that he would be able to return at the right time to reap it nor could he give it any attention while growing. But if, as in this case, he were already more or less anchored to a spot where it was easy for him to obtain his food supply by the methods of hunting and fishing, with which he was already familiar, he would be very favourably placed for supplementing it by practising the newer method of tilling the ground.

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[1] "The Recent Geology and Neolithic Industry of the Northern Fayum Desert" (*Journal of the Royal Anthropological Institute*, vol. 56, 1926) and "Recent Work on the Problem of Lake Moeris" (*Geographical Journal*, vol. 73, 1929).

Chemical Detection of Artificial Transmutation of Elements

IF detection of elements originating from artificial transmutation can be attained by chemical methods, not only will this mean a desirable checking of physical observations, but also new results may thereby be obtained. For physical means of discerning the transmutation of elements—whether by observing scintillations or by electrical methods—presuppose that the atoms which originate are expelled with a certain minimum energy; processes which take place with lesser energy remain at present unknown to us, even although they are perhaps quantitatively more important than the already ascertained cases of artificial disintegration of atoms.

First may be discussed the question whether the hitherto known modes of artificial disintegration of atoms offer any prospect of giving sufficiently large amounts of matter for a chemical test of the new products. Here we will confine ourselves to hydrogen, helium and neon, as so far we have worked only on these elements, and because the methods of their analysis are amongst the most sensitive of all. Several years ago we ascertained[1] that under the most favourable conditions the practical detection-limit for helium is within the order of magnitude of 10^{-10} c.c. (that is, about 10^{10} atoms), and that one