Letters to the Editor.

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Palæolithic Man in Ireland.

No one ever questioned the possibility that traces of palæolithic man might one day be found in Ireland, in spite of the negative results of excavations, chiefly in caves, carried out over many years by the Royal Irish Academy and the Royal Dublin Society. From time to time individuals have announced their discovery of palæolithic implements, but in every case such reports were open to the gravest scientific objection. It is therefore with very special pleasure that we welcome the news contained in the accompanying statement, that the discovery has at last been made.

The work which has thus been crowned with success was carried out last August, by a party of the Bristol Spelæological Society, under the leadership of Mr. E. K. Tratman. It was financed by the Royal Irish Academy, and some members of that body made the local arrangements and collaborated in the excavation; but the credit of the discovery is due to Mr. Tratman and his colleagues.

A short time ago we found ourselves constrained to adopt a position adverse to a discovery of alleged palæolithic implements on the west coast of Ireland. We have never seen any reason to change our views on this matter: everything that has been written about it, and every visit which we have paid to the site, have only confirmed us in our opinion. Every possible explanation has been sought for our attitude, except the simple and obvious one that we did not, and do not, consider the 'discovery' in question to be more worthy of scientific acceptance than any of its not infrequent predecessors of the same type. We have been accused of upholding preconceived prejudices in the face of evidence. We have been accused of the yet more unworthy motives of personal or national jealousy. We are therefore the more happy in being able to express our complete acceptance of the discovery here announced, and our full appreciation of its importance.

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EXCAVATIONS AT KILGREANY CAVE, NEAR DUNGARVAN, CO. WATERFORD, 1928.

IN the summer of 1928 excavations were carried out at this cave under the auspices of a joint committee, consisting of members of the Royal Irish Academy and the Spelæological Society of the University of Bristol. The work was carried out personally by the members of the committee, assisted by students from Trinity College, Dublin, and the University of Bristol.

The excavations gave the following stratification, outside the present cave mouth.

1. Quarry debris from the roof of the former outer chamber of the cave, 0-2 ft.
2. Hearth number 1, of late Bronze to early Iron Age date, 2-4 ft.
3. A layer of brown earth and stones, with but few finds.
4. Hearth number 2. Part of a polished stone axe came from this, suggesting a very late Neolithic to

early Bronze Age date. A number of human skeletons, very fragmentary, came from this level, 4 ft. - 4 ft. 6 in.

5. A stalagmite floor, divided into an upper tufaceous portion and a lower crystalline part. These were separated by a third hearth. The crystalline stalagmite was barren of remains, 4 ft. 6 in. - 9 ft.

6. A layer of loosely piled stones of unknown depth, but reaching to a depth of 12 ft. from the original surface. No remains from this layer.

The surface of layer 5 was intact, all over the area in which it was exposed. Before the task of excavating it was begun, special care was taken to ensure that all the upper deposits had been removed.

Leaning against a projecting piece of the wall of the cave, and originally held in position there by a pile of stones (which had become completely embedded in the stalagmite as this material accumulated), was a human skeleton, in a semi-crouched position, with the left side against the cave wall. As the limbs of the skeleton were traced down, through the stalagmite, to the level of the third hearth, and as there was absolutely no evidence of there ever having been any disturbance of the stalagmite by a burial inserted from above, it is obvious that the skeleton represents a deliberate burial from the level of the third hearth; a fact of first-class importance from the archaeological and anthropological points of view; and one also that has important bearing on some of the geological problems of the late Pleistocene period.

The fauna yielded by the tufaceous part of the stalagmite was as follows: wild boar, Irish giant deer (or 'Irish elk'), reindeer, brown bear, wolf, fox, cat, stoat, hare, field mouse, Arctic lemming, birds, and land mollusca. This is a very typical Late Pleistocene fauna.

The presence of the skeleton, and the third hearth actually at the base of the deposit yielding this fauna, is conclusive proof of the presence of man in the south of Ireland in Late Pleistocene times. It is unfortunate that as yet no implements have been recovered, so that we cannot yet place this Late Pleistocene man in his correct division of the Upper Palæolithic cultures.

A full illustrated account of this discovery will be published in the next issue of the *Proceedings* of the Bristol Spelæological Society, now in course of preparation.

E. K. TRATMAN.

Selection Rules in the Raman Effect.

RECENT experimental work by McLennan (*NATURE*, Feb. 2, 1929) on liquids and by myself (*Proc. Nat. Acad. Sci.*, March 1929) on gases has shown definitely that transitions between vibrational levels of a non-polar molecule such as nitrogen, oxygen, or hydrogen take place in the Raman effect. I have pointed out that this, far from being inconsistent with the well-known selection rules, is exactly what we should expect to happen from the quantum-mechanical theory of dispersion.

The selection rule which works in the Raman effect can be stated as follows: in order that a shift corresponding to the transition $i \rightarrow k$ may be observed, it is necessary that both states i and k combine at least with a third state l ; the Raman scattering becoming particularly intense when the energy $h\nu$ of the impinging quantum is near to $E_l - E_i$. If $E_l - E_i = h\nu$, we have fluorescence instead of a Raman effect.

The latest results I have obtained on gases, with an improved apparatus, seem to fit very well with this theoretical scheme. I will give here a brief account of them.

I have extended the investigation in the ultra-violet, using the line $\lambda 2536$ of mercury, since the intensity of