mens with a landing-net as they retreated down the rocks with the ebbing tide.

I cannot find any reference in my notes to the occurrence of *E. esculentus* on the limestone headland of Heilim on the east side of the loch. This is peculiar because, since the headland is of much eroded limestone affording a fine habitat for a multitude of organisms, I have examined it frequently during low water spring tides.

This would suggest that the nature of the rock—its physical nature or its chemical composition—might be a possible factor affecting the occurrence of *E. esculentus*. This point is being further investigated.

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Dinosaurian and Mammalian Remains in South India.

MY attention has been directed to an article on "Geological Exploration in India—Dinosaur Remains Unearthed" contributed by Dr. Matley to the *Records* of the Indian Geological Survey, 1929, in which he refers to a preliminary note on the fossil finds from Ariyalur—Trichinopoly Cretaceous area—published by Mr. B. R. Seshachar and myself in the *Mysore University Journal* (vol. 1, No. 2, July 1927). He writes that this party (zoology students) has been "fortunate in finding a number of dinosaurian bones including a vertebra, ilium, scapula, coracoid, head of a humerus, a tooth with a portion of the dentary, and limb bones,

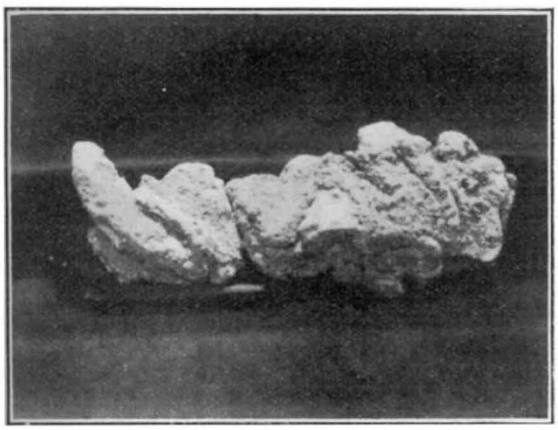

FIG. 1.—Fossil mandible of a carnivore taken in the Ariyalur area.

mostly in a broken condition. This discovery is of importance, as it is the first time that Southern India has yielded identifiable remains of dinosaurs." In the article referred to by Dr. Matley, there is a brief description of the humerus and carpal nodules and a broken amphicœlous vertebra of an ichthyosaurian, besides the ungulate remains of molar teeth of both perisso- and artiodactyles.

A detailed treatment of this interesting collection was deferred with the view of exploring the region more thoroughly, so as to obtain more evidence of the occurrence of the reptilian and mammalian fossils in the Trichinopoly area. In an expedition conducted to this place in December last, we have, in spite of the unfavourable weather conditions prevailing at the time, been fortunate in obtaining some more fossils. Among them we found a portion of a carnivore mandible with the teeth beautifully preserved, a large number of molar teeth of artiodactyles, together with tarsal, metatarsal, and phalangeal bones, humerus and femur, tibia, radius and ulna, scapula and broken specimens of vertebra of both carnivores and ungulates. Our collection is by no means exhaustive, but is sufficient to establish the occurrence of both reptilian and mammalian fossils in the area. I do not propose to deal with the material in this communication, which is merely intended to notify the discovery of an extremely interesting series of fossils in South India, nor do I propose to discuss here the probable theories which have been put forward to account for such occurrence. The photograph of the mandible reproduced as Fig. 1 will give an idea of the condition in which the fossils occur in the Cretaceous area of South India. A detailed description of the material will appear soon elsewhere.

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Natural Ionising Radiation and Rate of Mutation.

ABOUT a year ago there appeared in these columns a communication by A. R. Olson and G. N. Lewis on natural radioactivity and the origin of species (NATURE, April 28, 1928, p. 673), in which it was suggested that the natural ionising radiation of the earth plays an important part in evolution. It was pointed out that the relative effects of rays of different frequency upon the production of variants have not been experimentally ascertained, but that since the rays can only be effective when absorbed, and thus produce ionisation, it seems safe to assume that the various rays will produce biological effects in proportion to the ionisation they cause.

It was our good fortune to discover a location in a street car tunnel in San Francisco, only 15 miles from Berkeley, where the natural ionising radiation is fully twice as great as the radiation in our laboratory in Berkeley. Accordingly, an experiment was planned for the purpose of comparing the rates of occurrence of sex-linked lethal mutations in *Drosophila melanogaster*, following a method already devised by Muller (*Genetics*, **13**, 279-357; 1928) and using a balanced lethal strain synthesised by him.

Up to the present, 5981 individual males have been tested in the first phase of the experiment. Of this number, 3481 tests were made in Berkeley, and 9, or 0·26 per cent, produced no male flies and so revealed the occurrence of new lethals, while 2500 tests were made in the tunnel, and of these 13, or 0·52 per cent, contained no male flies. The difference in rate, $0{\cdot}26 \pm 0{\cdot}11$, while only 2·5 times the probable error, may be fairly significant. When the difference in rate of mutation is computed by a method which analyses the actual experimental variation in rate in the several subgroups in each of the two series (Berkeley and San Francisco), the variation within the series is found to be less than that to be expected in random sampling, so that the significance of the difference between the average rates for the two locations is increased. This difference is $0{\cdot}275 \pm 0{\cdot}086$.

It seems fairly safe to assume, therefore, that the same difference in rate of mutation will continue throughout the remainder of the experiment, in the second phase of which an *X*-chromosome from a normal wild type strain is being tested in alternate generations. This not only doubles the scope of the experiment but also makes it possible to test such lethals as occur in this new chromosome, which it is impossible to accomplish when working with the balanced lethal strain alone.

Even now, however, it seems fairly safe to conclude that the natural ionising radiation of the earth is a very important factor controlling the rate at which