Tribal Name of the Raninidæ.

IN the report of the Linnean Society's meeting on December 15 last the abstract of an elaborate and highly important essay by Prof. G. C. Bourne on "The Raninidæ: A Study in Carcinology" contains a proposal to place the family "in a separate tribe, Gymnopleura."

It would seem, however, that the name for such a tribe has been anticipated by Latreille, who, under date 1831, in his "Cours d'Entomologie," p. 368, institutes the tribe Notopterygia expressly for the genus Ranina. Attention has been directed to this in the comparatively recent year 1908 in the Annals of the South African Museum, vol. 6, p. 17. The same page explains that the specific name in *Ranina dentata* is founded on a mistake, and the preceding page, while giving a wrong date to the Mantissa of Fabricius, will by its synonymy justify the substitution of *Ranina raninus*, Linn., in preference alike to *R. scabra* and *R. dentata*.

THOMAS R. R. STEBBING.

Tunbridge Wells, December 22.

I AM far from a scientific library and unable to verify Mr. Stebbing's reference to Latreille's classification of the Raninidæ, but have not the least doubt that the reference is correct. There is no reference to Latreille's tribe Notopterygia either in Milne Edward's "Histoire Naturelle des Crustacés" or in de Haan's "Crustacea" in Siebold's "Fauna Japonica," and as I was concerned rather with the correction of existing schemes of classification than with the work of earlier authors, Latreille's "Cours d'Entomologie" escaped my attention. Had I read it I should have suggested the restoration of Latreille's tribe, giving to it the new definition set forth in my memoir communicated to the Linnean Society, and it seems that my proper course will be to withdraw the name "Gymnopleura" and substitute that of "Notopterygia, Latreille," in an addendum to the printed paper.

G. C. BOURNE.

Twyning Manor, Tewkesbury, December 30.

The Depth of Earthquake Focus.

IN the Philosophical Transactions of the Royal Society, Series A, vol. 222, pp. 45–56 (1921), Mr. G. W. Walker, relying on certain observations of the emergence-angle of P waves at Pulkovo, makes the somewhat startling suggestion that the depth of focus is of the order one-fifth of the earth's radius, or about 1250 km. This is a much larger estimate of depth than that hitherto suggested, viz. of order less than 100 km. Mr. Walker's estimate of depth is a consequence of accepting the Pulkovo numbers as correct. It appears that the values of the apparent angle of emergence calculated from Zöppritz's curve do not agree with its value directly measured at Pulkovo. This discrepancy is so marked that either the time-curve or the Pulkovo values must be seriously in error, and Mr. Walker proceeds on the assumption that within the limits of possible error in the time-curve we can modify it so as to agree with the direct measure of the apparent angle of emergence.

It appeared to me that in a matter so important independent proofs would be desirable, and an attempt has been made to obtain an estimate of depth from the following considerations:—For a very deep focus, the long-wave phase in the seismogram or the "main strock" identified with the arrival of Rayleigh's two-dimensional surface-waves would be of diminished importance compared to the P and S phases which are due to the three-dimensional longitudinal and transverse waves travelling by brachistochronic paths from focus to station, in view of the fact that the surface-waves are originated by the shocks in the epicentral region. These shocks in their turn are due to the arrival of the longitudinal and transverse waves from focus to the epicentral region, and these waves, varying as they do as the inverse powers of the distance, make the shock in that region of lesser and lesser intensity the greater the depth of the focus. Consequently, the depth to be chosen for the focus must be of such a magnitude that the observed relationship between the principal phases in the seismogram is maintained. It has been found possible to calculate the effects of various focal depths on the relative importance of the different phases in the seismogram by an extension of the procedure adopted by Lamb in determining the propagation of tremors on the surface of an elastic solid (Phil. Trans., A, vol. 203, 1904). The investigation suggests that the hitherto accepted estimate of depth of focus is much nearer the truth than Mr. Walker's estimate. The detailed calculations will be published in due course.

S. K. BANERJI.

University College of Science, Calcutta, December 22.

Energy Changes Involved in Transmutation.

IN some recent discussions concerning the possibility of the transmutability of large amounts of one element into others—and particularly that of lead into gold—no mention has been made of the energy changes involved. Studies in radio-activity and the work of Sir Ernest Rutherford have shown that whenever an element breaks up a relatively enormous quantity of energy is liberated.

Should it ever become possible to control the breaking up of elements, the advantages to be gained will lie in two main directions. First, the manufacture of elements now scarce from those more plentiful will be of the utmost value to industry. Secondly, the fact that intra-atomic energy will then be available should provide a satisfactory solution to the problems raised by the world's dwindling sources of power.

But if the energy available in this way is ever extensively used, all the heavier elements will be destroyed and gradually replaced by lighter; at the same time their available energy will be lost. So it appears possible that after countless ages the earth may become a mass of light elements, possibly in the condition of a nebula.

It has been assumed above that it would be possible to control the decomposition of elements so that only a limited amount of energy was liberated at a time. It is of some interest to contemplate what will happen should this evolution of energy get out of hand.

Let us suppose that someone has succeeded in starting the rapid decomposition of a block of a heavy element by the use of some accelerating influence. If the energy liberated during the action can escape faster than it is set free, no violent action is to be expected; but if, on the other hand, it is liberated faster than it can escape, an action of explosive violence may occur. The accumulation of energy will certainly increase the rate of decomposition of surrounding atoms, which in their turn will add still more energy, and the change will go on with ever-increasing velocity until the whole block of the element is destroyed. Should the surrounding elements be unable to stand up against the enormous quantity of free energy at their surfaces, it seems that nothing could save the earth from complete destruction. Thus inadvertently the world might be reduced by some enterprising chemist or physicist to a white-hot nebulous mass.

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