

VI. of the periodic table being followed by Nos. IV., II., and zero, and then by Nos. VI<sub>B</sub> and V<sub>B</sub>.

In period VI<sub>B</sub> polonium appears to be the starting-point of a new line, the thorium and actinium elements of which are still unknown. No further products of Act C are known corresponding to the polonium branch of the radium series, and Act C, if it existed, should, by Fig. 1, have the record range of about 10 cm. About 0.17 per cent. of the Act C rays are, however, said to have a range of 6.1 cm., which would be fairly suitable to an element of at. wt. 206 on a line drawn parallel to the others on Fig. 1 starting from polonium.<sup>1</sup>

It is specially noticeable that to make the actinium points lie on the same lines as the corresponding radium and thorium elements, its atomic weight must be reckoned in every case from actinium=222 instead of 226. This means that the actinium series branches off from the uranium stock at Ur(2) instead of at Ur(1). Either scheme is equally allowable, but no evidence has hitherto been brought forward to decide between them.

Another set of lines can be drawn on Fig. 1, one through the actinium points, one through the thorium points, and the lowest through the uranium elements. The latter are, however, very scattered, and include thorium itself amongst them. The lines do not go beyond the "A" elements.

These relationships were detected from noticing first the evident family resemblance between the  $\gamma$  rays in the isotopic groups. For example, in period IV<sub>B</sub> we have:—

	"K" Series	"L" Series	Soft Rays	$\beta$ Rays
Ra B	0.19	1.47	85	75
Th B	0.13	11.8	59	110
Act B	0.17	11.5	44	—
Ra D	0.36	16.7	—	130
Lead	—	17.4 <sup>2</sup>	—	—

Among the  $\beta$  rays something of the sort is noticeable,  $\mu$  generally falling with increasing atomic weight, but for the very soft ( $\beta$ ) rays  $\mu$  is directly proportional to the 33rd power of  $\omega$ .

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### The Naming of Earthquakes.

AN earthquake is usually distinguished by the name of the town, province, or country, near or within which it originates, and by its date—the double nomenclature serving to determine its position in space and time. With regard to the latter element, absolute uniformity prevails. The year, month, and day are always given, except for great and long-past earthquakes, for which the year only is sufficient. My object in this letter is to suggest the desirability of similar uniformity in the use of the place-name.

Nearly all seismologists have a different standard for earthquakes of their own country and for those of distant lands. An Italian, for instance, will speak of a Benevento earthquake or a Neapolitan earthquake, but also of an Indian earthquake, or even of an Asiatic or Pacific Ocean earthquake. Temporarily, no doubt, the use of the country's name is convenient; but, as every country contains many seismic regions, its continuance is undesirable. Even in the same country various methods prevail. Thus, Indian seismologists describe a Bengal, a Kashmir, and a Kangra earthquake.

<sup>1</sup> With such a short range of  $\omega$  it is not easy to distinguish  $\log \omega$  from  $\alpha$ . For convenience,  $\omega$  and  $\alpha$  are both shown on this scale, as well as  $\log \omega$  and  $\log \alpha$ .

<sup>2</sup> The figure for lead is for the characteristic X-ray.

These variations in nomenclature are clearly inconvenient. On the one hand, different names are given to the same earthquake. Thus, one may be called the East Anglian, the Essex, or the Colchester earthquake; another the Indian, the Assam, or the Calcutta earthquake. On the other hand, the same name is applied to earthquakes with different origins. In the writings of Italian seismologists, the terms "Calabrian earthquake" is of frequent occurrence. As a family or generic name it is useful, but it groups together earthquakes which belong, as Dr. M. Baratta has shown, to eleven different seismic zones. Thus the six great earthquakes of the Calabrian series of 1783 affected in succession the Palmi, Scilla, Monteleone, Messina-Scilla, Monteleone, and Girifalco zones, and might with advantage have been designated by their names. Again, the earthquake of 1638 occurred in the Nicastro zone, that of 1659 in the Monteleone zone, that of 1836 in the Bisignano zone, that of 1854 in the Cosenza zone, that of 1894 in the Palmi zone, and that of 1907 in the Gerace zone. These earthquakes, in like manner, might be named after the corresponding zones. To this rule, however, there must be occasional exceptions. For instance, the earthquake of 1905 originated in five zones, and it would be out of the question to call it the Palmi-Monteleone-Nicastro-Cosenza-Bisignano earthquake of 1905. When the epicentre covers so large a part of a province, it establishes a claim for this earthquake to be known as the Calabrian earthquake of 1905.

While adhering so far as possible to prevalent customs in naming earthquakes, and especially adopting those assigned to them by their principal investigators, I would suggest that the choice of names should be determined by the following principles:—

(1) Old and obsolete names of districts, such as East Anglian, should be avoided, as conveying little or no impression of locality to foreign seismologists.

(2) Names of valleys, hills, seas, lakes, or other physical features should not as a rule be used, with perhaps occasional exceptions, such as Exmoor or Ochil, when there are no prominent towns or villages in the neighbourhood of the epicentre.

(3) Names of islands as geographical terms may, however, be usefully employed when the islands are small (as Zante), or perhaps large and not well known (as Formosa), but not when they are large and well known (as Jamaica). Thus, it would be more convenient to speak of the Ischian than of the Casamicciola earthquake, and of the Kingston and Port Royal than of the Jamaica earthquakes.

(4) Whenever possible, the name of a prominent or well-known town near the epicentre should be applied. The term Charleston earthquake, for instance, is more descriptive than the Woodstock-Rantowles earthquake, though these places are much closer to the double epicentre.

(5) If there is no large town near the epicentre, the name of a small town or village (with that of the province or county added in brackets) may be used with advantage, such as the Viggianello (Basilicata) earthquake of 1894, or the Strontian (Inverness-shire) earthquake of 1902.

(6) When the epicentral area is of considerable size, the name of a single town ceases to convey the desired impression, and the names of many places would be cumbersome. Thus, an earthquake with an epicentral area at least 290 miles in length deserves the name of Californian rather than that of San Francisco. An earthquake which originates in five seismic zones, which are often disturbed separately, is, as already mentioned, suitably described as a Calabrian earthquake.

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