prevalent opinion that dangerous shocks are only to be apprehended two or three times in the course of a century, cause faint oscillations of the soil to be regarded in Lima with scarcely more attention than a hail storm in the temperate zone.

Having thus taken a general view of the activity—the inner life, as it were—of the Earth, in respect to its internal heat, its electro-magnetic tension, its emanation of light at the poles, and its irregularly-recurring phenomena of motion, we will now proceed to the consideration of the material products, the chemical changes in the earth's surface, and the composition of the atmosphere, which are all dependent on planetary vital activity. We see issue from the ground steam and gaseous carbonic acid, almost always free from the admixture of nitrogen;* carbureted hydrogen gas, which has been used in the Chinese province Sse-tschuan† for several thousand years, and recently in the village of Fredonia, in the State of New York, United States, in cooking and for illumination; sulphureted hydrogen gas and sulphurous vapors; and, more rarely,‡ sulphurous and hydrochloric acids.§ Such effusions

ber, in November, December, January, May, and June. Experience gives reason to expect the visitation of two desolating earthquakes in a century. The period between the two is from forty to sixty years. The most considerable catastrophes experienced in Lima since Europeans have visited the west coast of South America happened in the years 1586, 1630, 1687, 1713, 1746, 1806. There is reason to fear that in the course of a few years this city may be the prey of another such visitation."—Tschudi, op. cit.]—*Tr.*

* Bischof's comprehensive work, *Wärmelehre des inneren Erdkörpers.*

† On the Artesian fire-springs (Ho-tsing) in China, and the ancient use of portable gas (in bamboo canes) in the city of Khiung-tsheu, see Klaproth, in my *Asie Centrale*, t. iii., p. 519–530.

‡ Boussingault (*Annales de Chimie*, t. lii., p. 181) observed no evolution of hydrochloric acid from the volcanoes of New Granada, while Monticelli found it in enormous quantity in the eruption of Vesuvius in 1813.

§ [Of the gaseous compounds of sulphur, one, sulphurous acid, appears to predominate chiefly in volcanoes possessing a certain degree of activity, while the other, sulphureted hydrogen, has been most frequently perceived among those in a dormant condition. The occurrence of abundant exhalations of sulphuric acid, which have been hitherto noticed chiefly in extinct volcanoes, as, for instance, in a stream issuing from that of Puracè, between Bogota and Quito, from extinct volcanoes in Java, is satisfactorily explained in a recent paper by M. Dumas, *Annales de Chimie*, Dec., 1846. He shows that when sulphureted hydrogen, at a temperature above 100° Fahr., and still better when near 190°, comes in contact with certain porous bodies, a catalytic action is set up, by which water, sulphuric acid, and sulphur are produced. Hence probably the vast deposits of sulphur, associated with sulphates of lime and strontian, which are met with in the western parts of Sicily.]—*Tr.*