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LXIV. Intelligence and miscellaneous articles

J. J. Taudin Chabot

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matters, this text-book treats of—Division I.—(1) the Earth's origin and the Nebular Hypothesis. (2) Igneous action; internal heat. (3) Volcanoes and volcanic rocks; intrusive and plutonic rocks. (4) Metamorphism of rocks. (5) Earthquakes, and earth-movements. Division II. (6) Aqueous action; its results in forming strata derived from rocks denuded by rain, rivers, frost, snow, ice, and glaciers. (7) Climate; its changes and effects. Division III. (8) Life; fossils. (9) Stratigraphical Geology; the successive groups of strata and their fossils. Division IV. (10) Petrology; structure and conditions of strata and other rock-masses; mineral veins; mineralogy; crystallography. (11) The classification and methods of recognizing and distinguishing minerals and rocks.

The fourth Division or Section has been added to this edition, "embracing all the more recent requirements of the South-Kensington Syllabus, which now includes under the name of 'Geology' many topics which were formerly confined to Mineralogy and Crystallography. The new matter comprises chapters on rock-forming minerals, their composition, distribution, characters, and the methods of their identification; on crystallography; on volcanic and plutonic rocks, and the microscopic examination of rocks."

Further chapters give a glossary or instructive explanation of some technical terms relating to common and important phenomena met with by the geologist; also a table of the range in time of important fossil genera (this will bear improvement); appendix on Geological Surveying; and some examination-papers set at South Kensington in 1895-98; there is also an index.

This is one of "Murby's Science-and-Art-Department Series of Text-books"; and doubtless it is far better, in both construction and contents, than many of the small manuals of geology that are in the hands of students; and it rivals in value some of the more costly text-books. Besides the good arrangement of the manifold aspects and evidences of the science, the statements and description are clearly and tersely given; the leading words are well distinguished by proper types in the text; and the technical terms are etymologically explained at one place or another (but at page 67 "*streachan*, the stretch," should be *strecken*, to stretch).

The letterpress and, in some cases, the woodcuts are not clearly printed. The zoologist might easily find fault with some of the figures of, and references to, the lower animals: there are some misprints, as "Syenctic"; siliceous rocks, at p. 78, are not at all well defined; and calcite is omitted from the hexagonal system at p. 198; there are several slips in the latinity, such as "*folia*," instead of *folium*, a leaf; and the false concord of *Echinoidea regulares et irregulares*! Nevertheless this is a good and useful text-book, and we recommend it for use in schools and colleges.

LXIV. *Intelligence and Miscellaneous Articles.*

A NEW COMBINATION OF WHEEL-GEARING. (SECOND COMMUNICATION*.) BY J. J. TAUDIN CHABOT.

1. THE teeth of the wheels of the model described in my previous communication forming helices, or screw-lines, the constituent wheels themselves are divisible into two classes according as the screws are left-handed or right-handed.

* See Phil. Mag. vol. xlvi. p. 428 (Oct. 1898).

2. Models of the kind described may therefore likewise belong to either of two classes—one constructed with wheels whose teeth form left-handed screws; the other with wheels whose teeth are right-handed.

3. The properties of models of the two kinds are, when considered each by itself, identical; but relatively to each other they exhibit symmetrical inversion.

4. On attempting to combine a constituent of one of the above classes with one of the other class, it is found that it is possible to make them gear into each other only when their axes of revolution are parallel. Such a combination of helical-toothed gearing with parallel axes has a similar property to a combination with axes at right angles (the separate wheels being consequently of the same kind): a limited positive or negative acceleration of the rotation of one of them causes the rotatory motion of both to be partially transformed into motion of translation: the wheels move in opposite directions along their axes of rotation until the acceleration ceases or is replaced by one of opposite sign, and so on (*vid. Phil. Mag. loc. cit.*).

5. By combining with each other in different ways pairs of right-handed and pairs of left-handed helical-toothed wheels (thus forming at the same time one or more of the pairs mentioned in the last paragraph), various closer combinations can be made, each of which is distinguishable from the rest, and can in turn serve, as a unit of a higher order, for building up a wheel-model with a regular distribution in space, and with the described properties of transforming rotatory motion into motion of translation.

6. The number of possible models of this latter kind is, in general, dependent upon the number of elements which go to the formation of their constituents,—the more numerous these are, the longer in each case is the series of the possible resulting combinations.

Degerloch (Württemberg), November 4th, 1898.

To the Editors of the Philosophical Magazine.

GENTLEMEN,

IN the May number of this Magazine (pp. 432–447) Mr. A. P. Wills has described a method of measuring with the balance the susceptibility of diamagnetic and feebly magnetic substances. I venture to point out that the same method was described by me so long ago as 1889 (*Tageblatt der 62 Versammlung deutscher Naturforscher und Aerzte in Heidelberg*, pp. 209–211), as used for measuring the magnetic constants of Iron, Nickel, Cobalt, Oxide of Iron and Bismuth, parallel and perpendicular to the lines of magnetic force. The method effects for solids precisely what the method I have given of measuring magnetic forces by means of hydrostatic pressure does for liquids (*Wiedemann's Annalen*, xxiv. pp. 347–416, 1885), and has for ten years past been repeatedly used in my Laboratory here, as for instance by Herr Paul Meyer (Dissertation, Heidelberg, 1889; *Electrotechnische Zeitschrift*, x. pp. 582–587); Max Weber (*Wiedemann's Annalen*, liv. pp. 30–43, 1895), and Ernst Seckelson (Dissertation, Heidelberg, 1898).

University of Heidelberg.
Physical Laboratory,
November 7, 1898

Very faithfully yours,

G. QUINCKE.