OUTLINES OF THE HALF-COURSE IN NATURAL HISTORY 4: WITH REFERENCES TO DANA'S MANUAL OF GEOLOGY, AND NOTES

Published @ 2017 Trieste Publishing Pty Ltd

ISBN 9780649493647

Outlines of the Half-course in Natural History 4: With References to Dana's Manual of Geology, and Notes by Anonymous

Edited by Trieste Publishing Pty Ltd.
Cover @ 2017

www.triestepublishing.com

ANONYMOUS

OUTLINES OF THE HALF-COURSE IN NATURAL HISTORY 4: WITH REFERENCES TO DANA'S MANUAL OF GEOLOGY, AND NOTES

Trieste

OUTLINES

OF THE HALF-COURSE IN

NATURAL HISTORY 4,

WITH REFERENCES TO

DANA'S MANUAL OF GEOLOGY,

AND NOTES.

Cambridge, Mass.:
WM. H. WHEELER, PUBLISHER.
1885.

OUTLINES OF NATURAL HISTORY 4.

INTRODUCTORY.

The Earth.

How regarded. *Dana, pp. 1-2.*

Earth is to be treated as a mechanism which has a history; as a theatre (1) of the application of force, (2) of the development of life. It is as truly as is the steam-engine, a mechanism which is applying solar force.

Kepler's idea of the earth as a living, breathing creature is nearer right, than that of an utterly inanimate mass.

Relation to Universe. *Dana, p. 3.*

Three proofs of Earth's kinship to plants:—

(1) Telescopic—spherical form, continents and volcanos.

(2) Meteoric—elements and laws of crystallography same.

(3) Spectroscopic—elements of sun, etc., same as those of earth.

Aim of Geology. *Dana, pp. 4-6.*

I. Physiographic Geology.

Earth's Contour and Surface Divisions.

Its form. *Dana, p. 9.*

Flattening of earth is correlated with its rotation, being just what would result from earth's present angular velocity in a liquid globe of same size and density. This gives proof of the present or former molten state of the earth.

LAND AND WATER. *Dana, pp. 10, 13.*

From the cooling and development of an original nebulous mass, there results a solid surrounded by two oceans, of water and air, respectively. Much depends on the interaction of these two oceans, one partially, the other entirely covering the earth's surface. We see on surface of globe a great land-mass about No. Pole from which three triangles project southward into mass of water about So. Pole. Note that oceans keep practically same level, while lands rise and fall. Two great geologic forces are constantly at work on land, those above and at sea-level being acted on by *erosion*, the destructive force, and those below sea-level being subjected to *deposition*, the constructive force.

DEPTH OF OCEANS. *Dana, pp. 11, 12.*

Note that this is on the average much greater than the elevation of land-masses.

SURFACE RELIEFS. *Dana, pp. 15-23.*

Substitute for definition of *mountain*, as follows:— *A mountain* is a ridge of the earth's surface in which at least a part of the relief is due to the folding of strata.

A hill is a relief caused by the cutting away of parts of strata by erosive action, leaving remainder as an elevation.

A volcanic cone is an elevation produced by a deposit of substance ejected from a crater.

SYSTEM IN EARTH'S RELIEFS AND FEATURE-LINES. *Dana, pp. 23-38.*

Dana has been chief student of this subject and has given it undue prominence here. Read especially "Law of the System," p. 23, and "Recapitulation," p. 37. Great exception to general N. W. and N. E. trends is the Indo-European mountain system which trends E. and W.

ATMOSPHERIC CURRENTS. *Dana, p. 43.*

These give us key to oceanic currents and are therefore taken up first. If we had no atmosphere of air, we should have one of steam as a result of the sun's heat

which is sufficient to melt 8000 cu. mi. of ice, daily. Were there no transportation of heat, the temperature of the tropics would be perhaps 150° and that of the poles — 50° F. This would leave but a narrow belt where life could exist and it would probably be kept off there by furious winds. But since air is easily penetrated by direct heat and holds that which has entered it, lower air at Equator becomes very much warmed, and rises, causing an inflow of cooler air from poleward regions, to balance which an outflow towards poles takes place in upper air. This would give north and south winds toward the Equator in the tropics. But as earth's rotation causes an effect like that of a turn-table, throwing moving bodies on its surface to the right of a direct course, these currents of air are thrown to right, and N. E. and S. E. wind produced, known as the Trades. But air is a very poor conductor of heat and acts to equalize temperature only in a secondary way.

OCEANIC CURRENTS. *Dana, p. 38.*

Trade winds blowing steadily over the oceans within the tropics toward N. W. and S. W. cause, by their constant brushing over the surface, strong currents in the same directions, which meet near the equator and flow out on a westerly course. If earth's surface were wholly water this current would simply follow the equator, but being broken up by continents, it is turned N. and S. and carries into Temperate and Polar regions vast quantities of heat.

Thus in Atlantic the equatorial current splits on C. St. Roque, and losing influence of trades, a great current is carried by its own inertia up the western shore and across the ocean to its northeastern shore, and on in part, into the Arctic Zone. A part of this great "Gulf Stream" returns along the coast of Europe, but much the greater part returns along the bottom of the ocean, as a slow, cold current. Dr. Croll has shown that the Arctic Zone gets