The Geological Survey is making a geologic map of the United States, which necessitates the preparation of a topographic base map. The topographic base map is a representation of the natural features of the surface of the earth, and the structure-section map shows their underground relations, as far as is known, and in such detail as the scale permits.

KINDS OF ROCKS

Rocks are of many kinds. The original crust of the earth is stated to be 670 feet above sea; and all other rocks have been derived from them in one way or another. The surface of the earth, and the structure-section map shows above sea-level. Along the contour at 250 feet lie terraces of land surfaces since the earliest geological time. Through the transporting agencies of streams the surficial materials of all types are carried to the sea, where, along with material derived from the land by the action of the waves on the ocean, they form sediments. These are usually hardened into conglomerates, sandstones, shales, and limestones, but are still called "rocks" by the geologist, though popularly known as gravel, sand, and clay.

From time to time in geologic history igneous and sedimentary rocks have been deeply buried, consolidated, and raised again above the surface of the water; and the processes, through the agencies of pressure, movement, and chemical action, are often greatly altered, and in this manner the structure of the rock may be materially changed.

Igneous rocks.

These are rocks which have cooled and consolidated from a liquid state. As basalt, granite, and obsidian have been formed on land surfaces since the earthen crust of the earth. They are called "rocks" by the geologist, though popularly known as gravel, sand, and clay.

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Sedimentary rocks.

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in the table in the next column. The names of them may determine which was deposited first. The time of the oldest fossiliferous rocks to the any one period from those of another the patterns divided into periods. The names of the periods given the same name, as, for instance, Cambrian system and the time taken for its deposition are.

- The number and extent of surficial formations of the Pleistocene render them so important that, to distinguish them from those of other periods and from the igneous rocks, patterns of dots and circles, printed in any colors, are used.

- The origin of the Archean rocks is not fully known, for their structure section. The third set of formations consists of crystal-line schists and igneous rocks. At some period of their history the schists were piled up by successive concave folding of molten rock.

- But this pressure and intrusion of igneous rocks have not affected the overlying strata of the second set. Thus it is evident that an interval of considerable duration elapsed between the formation of the schists and the beginning of deposition of the strata of the second set. During this interval the schists suffered metamorphism; they were the tectonic action and they were subsequently eroded. The contact between the second and third sets, marking a time interval between two dates in the formation of rock, is another unconformity.

- The section and landscape in fig. 2 are ideal, but they illustrate relations which actually occur. The sections in the structure section sheet are related to the maps as the section is to the figure. The profiles of the surface in the section correspond to the actual slopes of the ground along the section line, and the depth of any mineral-producing or water-bearing stratum which appears in the section may be measured from the surface by using the scale of the geological section sheet.

- Columnar-section sheet—This sheet contains a concise description of the rock formations which are pictured on the columnar-section sheet. The diagrams and verbal statements summarize the facts relating to the character of the rocks, to the thickness of the formations, and to the time of their formation. The sections exhibit those relations in the columnar arrangement; the oldest formation is placed at the bottom of the column, the youngest at the top, and igneous rocks or other formations, when present, are indicated in their proper relations.

- The formations are combined into systems which correspond with the periods of geologic history. The thicknesses of the formations shown in the columnar arrangement: the oldest formation is placed at the bottom of the column, the youngest at the top, and igneous rocks or other formations, when present, are indicated in their proper relations.

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