GEOLOGIC ATLAS
OF THE
UNITED STATES
STEVENVSON FOLIO
ALABAMA - GEORGIA - TENNESSEE

INDEX MAP

LIST OF SHEETS

DESCRIPTION
TOPOGRAPHY
AREAL GEOLOGY
ECONOMIC GEOLOGY
STRUCTURE SECTIONS

WASHINGTON, D.C.
ENGRAVED AND PRINTED BY THE U.S. GEOLOGICAL SURVEY
BAILEY WILLS, EDITOR OF GEOLOGIC MAPS
S.J. KUBEL, CHIEF ENGRAVER
1895
The Geological Survey is making a large topographic map and a large geologic map of the United States, which are being issued together in the form of a Geologic Atlas. The parts of the atlas are called folios. Each folio contains a topographic map and a geologic map of a small section of country, and is accompanied by explanatory and descriptive texts. The complete atlas will comprise several thousand folios.

**THE TOPOGRAPHIC MAP.**

The features represented on the topographic map are of three distinct kinds: (1) inequalities of surface, called ridges; (2) plains, prairies, valleys, hills, and mountains; (3) distribution of water, called drainage, as streams, ponds, lakes, swamps and canals; (6) the works of man, called culture, as roads, railroads, boundaries, villages and cities.

Relief—All elevations are measured from mean sea level. The heights of many points are accurately determined and those which are most important are stated on the map by numbers printed in brown. It is desirable to show the elevation of any part of a hill, ridge, slope or valley; to delineate the horizontal-outlines or contour of all slopes, to indicate their degree of steepness. This is done by lines of constant elevation above mean sea level, which are drawn at regular vertical intervals. The lines are made heavy and are numbered; the heights of points above sea level are given by numbers printed in blue. The relations of contour characters to form of the landscape can be traced in the map and sketch.

3. Contours show the approximate grade of any drainage, and to indicate the distance between two contours, whether they lie along a cliff or on a gentle slope; but to give a rise on a gentle slope one may go far further than on a steep slope. Therefore contours are far apart on the gentle slopes and near together on steep ones.

The sketch represents a valley between two hills. In the sketch the slopes and forms of the surface are shown by contours.

1. A contour indicates approximately a height above sea level. In this illustration the contour interval is 50 feet; therefore the contours occur at 50, 100, 150, 200 feet above sea level. Along the contour at 250 feet lie all points of the surface 250 feet above sea level; and so on, above sea level. The summits of the higher hill is termed a crest; and the lower ground between the crest and the valley is called a valley.

3. The water courses are indicated by blue lines, which are drawn unbroken where the stream flows the year round, and dotted where the channel is dry a part of the year. Where the stream sinks and reappears at the surface, the supposed underground course is shown by a broken blue line. Marshes and canals are also shown in blue.

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The manner in which contours express the three conditions of relief, horizontal form and degree of slope are shown in the following sketch and corresponding contour map:

**THE GEOL O GIC MAP.**

A geologic map represents the distribution of rocks, as based on a topographic map, and is, to the topographic representation the geologic representation is added.

Rocks are of many kinds in origin, but they may be classed in four great groups: (1) Sedimentary Rocks; (2) Igneous Rocks; (3) Metamorphic Rocks; and (4) the works of man, called culture, as roads, railroads, boundaries, villages and cities.

The manner in which contours express the three conditions of relief, horizontal form and degree of slope are shown in the following sketch and corresponding contour map:

1. The sketch represents a valley between two hills. In the sketch the slopes and forms of the surface are shown by contours.

2. Contours define the horizontal forms of slopes. The western slope of the higher hill contrasts with the eastern slope and indicates the degree of steepness.

3. Contours show the approximate grade of any drainage, and the distance between two contours, whether they lie along a cliff or on a gentle slope; but to give a rise on a gentle slope one may go further than on a steep slope. Therefore contours are far apart on the gentle slopes and near together on steep ones.

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**Areas of sedimentary rocks are shown on the map by colors and symbols assigned to rocks of different states, of different countries and of different continents.**

**In any district several periods may be represented, and the representation of each may include one or many formations. To distinguish the sedimentary formations of any one period from those of another, the symbols for the formations of each period are printed in the appropriate period-color, and the formations of any one period are distinguished from one another by different patterns.**

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pour out of cracks and volcanoes and flow over the surface as lava. Sometimes they are thrown from volcanoes as molten particles, and are spread out over the surface by winds and streams. Often lava flows are interbedded with ash beds.

The oldest rocks of the earth, which formed during what is called the Archean period, were igneous. Igneous rocks have intruded among masses beneath the surface and have been thrown out from volcanoes at all periods of the earth's development. These rocks occur therefore with sedimentary formations of all periods, and their ages can sometimes be determined by the ages of the sediments with which they are associated.

Igneous formations are represented on the geologic map by patterns of triangles or rhomboids printed in any brilliant color. If the rock is a schist the dashes or any color and may be darker or lighter than the background. If the formation is of known age the letter-symbol consists of small letters which suggest the name of the rocks; when the age is known the letter-symbold has the initial letter of the appropriate period prefixed to it.

Metamorphism is promoted by pressure, high temperature, and the presence of water, which may thus grow. By this chemical alteration sedimentary rocks become crystalline, and igneous rocks lose their fine structure.

Marble is limestone which has thus been crystallized. It is one of the common minerals which may thus grow. By this chemical alteration sedimentary rocks become crystalline, and igneous rocks change their composition to a greater or lesser extent. The process is called metamorphism and the resulting rocks are said to be metamorphic. Metamorphism is promoted by pressure, high temperature, and water. When a mass of rock, under these conditions, is squeezed during movements in the earth's crust, it may become mica schist. When sedimentary rocks are formed in thin layers by deposition they are called slates; but when rocks of any class are found in thin layers that are due to pressure they are called slates. When the cause of the thin layers of metamorphic rocks is not known, or is not certain, the rocks are called schists, a term which applies to both slaty and slaty schistous formations.

Rocks of any period of the earth's history, from the Neogene back to the Archean, may be more or less altered, but the younger formations have generally escaped metamorphism, and the oldest sedimentary rocks known in some localities are essentially unchanged.

Metamorphic crystalline formations are represented on the map by patterns consisting of short dashes irregularly placed. These are printed in any color and may be darker or lighter than the background. If the rock is a schist the dashes or any color and may be darker or lighter than the background.

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Each formation shown in the columnar section is applied to a diagram representing the relations of rocks, and having traced out the relations among beds on the surface, he can infer their relations to the features of topographic sections. Thus it is possible to draw sections which represent the structure of the earth to a considerable depth and to construct a diagram exhibiting what would be seen in the side of a trench many miles long and several thousand feet deep. This is illustrated in the following figure:

The first of these, seen at the left of the section, is the group of sandstones and shales, which lie in a horizontal position. These sedimentary strata, which accumulated beneath water, are in themselves evidence that a sea once extended over their surface. They are very high above the sea, forming a plateau, and their elevation above sea level shows that that portion of the earth's mass on which they rest was greatly elevated before the deposition of the older beds and the accumulation of the younger. When younger strata rest upon an eroded surface of older strata or upon their upturned and eroded edges, the relation between the two is unformable, and their surface of contact is an unconformity.

The platen in Fig. 2 presents toward the lower land an escarpment which is made up of cliffs and steep slopes. These strata of the platen-front correspond to horizontal beds of sandstone and sandy shale shown in the section at the extreme left, the sandstones forming the cliffs, the shales constituting the slopes.

Where the strata of the platens appear at the surface their thicknesses can be measured and the angles at which they dip below the surface can be observed. Thus their positions underground can be inferred.

The thickness of a rock formation is the thickness of the rock, or of any part of it, which is below the surface by the use of the scale map or cross-section map, and it is accompanied at each occurrence by the name of the mineral mined or the stone quarried. The thickness of a rock formation is the thickness of the rock, or of any part of it, which is below the surface by the use of the scale map or cross-section map, and it is accompanied at each occurrence by the name of the mineral mined or the stone quarried.

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