GEOLOGIC ATLAS
OF THE
UNITED STATES
ROSEBURG FOLIO
OREGON

INDEX MAP

AREA OF THE ROSEBURG FOLIO

LIST OF SHEETS
DESCRIPTION
HISTORICAL GEOLOGY
ECONOMIC GEOLOGY
SPECIAL ILLUSTRATIONS

FOLIO 49

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EXPLANATION

The Geological Survey is making a geologic map of the United States, which necessitates the preparation of a topographic base map. The two are being issued together in the form of an atlas, the parts of which are called folios. Each folio consists of a topographic base map and a geologic map of a small area of country, together with explanatory and descriptive texts.

THE TOPOGRAPHIC MAP.

The features represented on the topographic map are of three distinct kinds: (1) inequalities of surface, called relief, as plains, plateaus, valleys, hills, and mountains; (2) distribution of water, called drainage, as streams, lakes, swamps; (3) 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 given on the map in figures. It is desirable, however, to give the elevation of all parts of the area mapped, to delineate the horizontal extent of all slopes, and to indicate their grade or degrees of slope. This is done by lines connecting points of equal elevation, called contour lines, and the uniform vertical space between two such contours is called the contour interval. Contours and elevations are printed in brown.

The manner in which contours express elevation, form, and grade is shown in the following sketch and corresponding contour map.

5. Contours define the forms of slopes. Since contours are continuous horizontal lines conforming to the surface of the land, and are usually smooth about smooth surfaces, recede into all resistant angles of ravines, and project in passing through contact prominences of the relief, drainage, and cultures of the district represented. View the landscape, map in hand, every character shows the approximate grade of any slope. The vertical space between two contours is the same, whether they lie along a cliff or rise a given height on a gentle slope. It must go further than on a steep slope, and therefore contours are far apart on gentle slopes and near together on steep ones.

For a flat or gently undulating country a small contour interval is used; for a steep or mountainous country a large interval is necessary. The smallest interval usually selected on the atlas sheets of the Geological Survey is 5 feet. This is used for regions like the Mississippi delta and the Delaware Swamps. In mapping great mountains, lines such as those in Colorado, the interval may be 200 feet. For instance, each of the contour intervals of 10, 20, 25, and 100 feet are used.

Drainage.—Watercourses are indicated by blue, and the stream flows the year round line is drawn broken, but if the channel is dry a part of the year the line is broken or dotted. Where a stream and its tributaries are shown, the superposed understands is shown by a broken blue line. Lakes, marshes, and other bodies of water are shown in blue, by appropriate conventional signs.

Culture.—The works of man, such as roads, railroads, and towns, together with cities, townships, counties, and states, are printed in black.

The map of each of these features is indicated, directly beneath its position in the sketch, by contours. The following explanation may make clearer the manner in which contours delineate elevation, form, and grade. Fig. 1—Sketch and corresponding contour map.

1. A contour indicates approximately a certain height above sea-level. In this illustration, the contour interval is 50 feet; therefore the contours are drawn at 50, 100, 150, 200, and so on, above sea-level. Along the coast, at 250 feet, and at all points of the surface 250 feet above sea; and similarly with any other contour. In the space between any two contours are found all elevations above the lower and below the higher contour. Thus the contour at 150 feet just below the edge of the terrace, while at 200 feet above the terrace; therefore all points on the contour are shown to be more than 150 but less than 200 feet above sea-level. The summit of the highest hill is stated to be 670 feet above sea; accordingly the contour at 600 feet surrounds it. In this illustration nearly all the contours are numbered. Where this is not possible, certain contours—say every fifth one—are accented and numbered; the latitude of the valleys and most of the coast is denoted by connecting up or down from a numbered contour.

2. The sketch represents a river valley between two hills. In the foreground is the sea, with a bay which is partly closed by a hooked sand-bar. Each side of the valley is a terrace. From the terrace on the right a hill rises gradually, while from that on the left the ground ascends steeply in a precipice. Contrasted with this precipice is a horizontal slope, or terrace. From the map each of these features is indicated, directly beneath its position in the sketch, by contours. The following explanation may make clearer the manner in which contours delineate elevation, form, and grade.

2. A contour is a continuous, horizontal line representing an equal interval of altitude. The distance between each two contours is called the contour interval. Contours and elevations are printed in brown.

The sketch represents a river valley between two hills. In the foreground is the sea, with a bay which is partly closed by a hooked sand-bar. Each side of the valley is a terrace. From the terrace on the right a hill rises gradually, while from that on the left the ground ascends steeply in a precipice. Contrasted with this precipice is a horizontal slope, or terrace. From the map each of these features is indicated, directly beneath its position in the sketch, by contours. The following explanation may make clearer the manner in which contours delineate elevation, form, and grade.

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In cliffs, canyons, shafts, and other natural and artificial cuttings, the relations of different beds to one another may be seen. Any cutting which exhibits those relations is called a section, and the same name is applied to a diagram representing the relations of the beds of the cliff. The arrangement of rocks in the earth's structure is a section exhibiting this arrangement is called a structure section. The three diagrams at the top of this page show the natural and artificial cuttings for his information concerning the earth's structure. Knowing the name of each formation of rocks, and having traced out the relations among beds on the surface, he can infer their relative positions after the patterns which represent the structure of the earth to a considerable depth, and construct a diagram exhibiting what would be seen in the side of a cutting many miles long and several thousand feet deep. This is illustrated in the following figure:

![Diagram showing inferred geological structure](image-url)

The third set of formations consists of crystalline schists and igneous rocks. At some period of their history the schists were deposited by pressure and traversed by eruptions of molten rock. But this pressure and intrusion of igneous rocks have not affected the overlying strata of the other 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 scene of eruptive activity; and they were deeply eroded. The contact between the second and third sets, marking a time interval between two periods of rock formation, is another unconformity.

The sections 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 map in the section in the figure is related to the landform. The profiles of the surface in the section correspond to the actual slopes of the earth's surface, and the depth of any mineral-producing or water-bearing stratum appears in the section may be measured from the surface by using the scale of the map.

### Columnar-section sheet
This sheet contains a columnar section of the same geologic formations and the rock formations which occur in the quadrangle. The diagram and verbal statements form a summary of the facts and observations of the details of the rocks to the thick section, which is set and a scale — usually 1000 feet to 1 inch. The order of accumulation of the strata is seen in the column or areas to represent the earth's structure section. The sections in the structure-section sheet are related to the map, which is drawn to a scale — usually 1000 feet to 1 inch. The order of accumulation of the strata and 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, which present, are indicated in their proper relations. The formations are combined into systems which correspond with the periods of geologic history. The rocks are described under the corresponding heading, and their characters are indicated in the columnar diagrams by appropriate symbols. The thicknesses of formations are given under the heading "Thickness in feet," in figures which state the least and greatest measurements. The average thickness of each formation is shown in the column, which is drawn to a scale — usually 1000 feet to 1 inch. The order of accumulation of the formations is indicated by the thicknesses of the strata, and a scale — usually 1000 feet to 1 inch. The order of accumulation of the strata is set at the same time as the ice deposit.