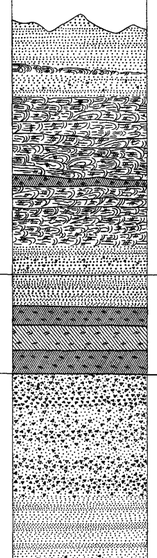
U.S. GEOLOGICAL SURVEY
CHARLES D. WALCOTT, DIRECTOR

COLUMNAR-SECTION SHEET

COLORADO
TELLURIDE QUADRANGLE

GENERALIZED SECTION OF THE SEDIMENTARY AND BEDDED VOLCANIC SERIES OF THE TELLURIDE QUADRANGLE.

SCALE: 400 FEET = 1 INCH.

Period.	Formation Name.	Symbol.	Columnar Section.	Thickness in Feet.	Character of Rocks.
EOCENE AND NEOCENE	Potosi rhyolitic series.	prh		1300+	An alternation of rhyolite flows and tuffs, the former predominating near the base. Some of the thin upper flows are glassy. A thin augite-andesite sheet occurs between rhyolite flows in the lower portion. Thirteen hundred feet is the maximum thickness preserved in the quadrangle.
	Intermediate series.	is		1300	An alternation of andesite and rhyolite flows and of tuffs containing both rocks. Andesite flows are usually prominent near the base. Some of the rhyolite flows are glassy. The series is of very irregular development in different places. The maximum thickness of 1300 feet is found near Ophir Pass.
	San Juan series.	sj		2000	Almost exclusively andesitic débris. Near the base it is a well-stratified tuff, but becomes coarser and less distinctly bedded in its upper portion. Fossils are not known. The series varies greatly in thickness from both primary causes and erosion preceding the eruption of the Intermediate series. The observed maximum thickness of 2000 feet is present on Marshall Creek.
EOCENE?	San Miguel formation.	Esm		200–1000	Chiefly a coarse conglomerate containing bowlders of granite, gneiss, Algonkian quartzite and schist, Paleozoic limestones, and rarely red sandstone. In Mount Wilson sandstone and shale become prominent. No fossils are known.
					UNCONFORMITY
CRETACEOUS	Mancos shale.	Kmc		2000+	Gray sandy shales, with local calcareous bands and sandstones. Embraces the Colorado group and a portion of the Pierre division of the Montana. Fossils occur sparingly. *Gryphæa newberryi* and *Ostrea congesta* characterize different layers near the base. The full original thickness of the Mancos shale is nowhere preserved in this vicinity, having been removed, with still higher Cretaceous beds, by the pre-San Miguel erosion.
	Dakota formation.	Kd		125–175	Gray or rusty-brown quartzose sandstones, with a variable conglomerate containing small chert pebbles at or near the base. Carbonaceous shale partings occur at several horizons. Coal is locally developed in these shales. Poorly preserved plant remains are the only fossils.
JURATRIAS	McElmo formation.	Jme		600–900	Many alternating beds of friable, fine-grained, gray sandstone and variegated shales, often sandy. Fossils have not been found.
	La Plata sandstone.	Jlp		100–175	Two white, even- and fine-grained sandstones, separated by a thin black limestone or calcareous shale. No determinable fossils have been found.
	Dolores formation.	Jd		1550+	A series of reddish quartzose sandstones, grits, and conglomerates, the latter usually containing granitic débris and fragments of Algonkian schists and quartzites. Several thin limestone conglomerates with small pebbles characterize the upper part. These contain fossils, among which are teeth of a crocodile (Belodon) and of a megalosauroid Dinosaur, remains of a ganoid fish, a gastropod like Viviparus, a Unio, and some undetermined species of plants.

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SPECIAL ILLUSTRATIONS

FIG. 1.—MOUNTAINS NORTH OF THE SAN MIGUEL RIVER, FROM EAST OF MILL CREEK.

The view is from the ridge between Mill and Butcher creeks, looking northwest. Campbell Peak is near the center, Iron Mountain on the left, and the high ridge on the right leads to Dallas Peak. The light-colored cliffs are caused by the San Miguel conglomerate; above them appear the clearly bedded San Juan tuffs. The highest levels are occupied by the Potosi rhyolite series. The talus slopes are typical of the region. (See page 8 of text.)

FIG. 2.—VIEW FROM THE SOUTH SIDE OF THE SAN MIGUEL RIVER, LOOKING TOWARD DALLAS PEAK, WHICH LIES TO THE RIGHT OF THE CENTER.

This shows the characteristic sculpturing of the volcanic series above the San Miguel conglomerate, which is hidden by talus, except on Eder Creek. The smooth, aspen-covered shale slopes lead down to the ledge of Dakota sandstone, across the San Miguel Valley from the point of view. (See page 8 of text.)

FIG. 5.—THE MOUNTAINS ABOUT MARSHALL BASIN, AS SEEN FROM BRIDAL VEIL BASIN.

The buttressed cliffs of the centerground lie between Marshall and Ingram creeks, and are carved from the San Juan formation. On the left is Marshall Creek, with its zigzag trail leading up to the basin, which is partly concealed by the ridge from Mendota Peak. The columnar cliffs of the background are in the Potosi rhyolite series. (See page 8 of text.)

FIG. 3.—CLIFFS OF THE SAN JUAN TUFF-AGGLOMERATE AND THE POTOSI RHYOLITE SERIES, EAST OF EDER CREEK.

View from the ridge leading up to Campbell Peak, looking east across Eder Creek to the cliffs of Dallas Peak. It shows the turret-like erosional forms often cut out of the San Juan tuffs, and the more massive cliffs of the rhyolite series. (See page 8 of text.)

FIG. 4.—GABBRO-DIORITE STOCK AT THE SOUTH BASE OF RUFFNER MOUNTAIN, FROM ACROSS EAST DEEP CREEK.

The common form of outcrop of the smaller stocks. The indurated and metamorphosed Cretaceous shales appear on either side. (See page 8 of text.)

FIG. 6.—MOUNTAIN CREST SOUTH OF VIRGINIUS BASIN, FROM STONY MOUNTAIN.

The Virginius and Terrible mines appear on the right hand. The trail to Marshall Basin passes through the notch above the mines. This view exhibits the topographic forms common in the zone of the Potosi rhyolite series. Below are the bare, avalanche-swept slopes of the Intermediate and San Juan series. (See page 8 of text.)

FIG. 7.—POTOSI PEAK, FROM THE SOUTH SIDE OF STONY MOUNTAIN.

On the right are the forks of Canyon Creek. This presents nearly the whole bedded volcanic series projected against the massive crags of the Stony Mountain gabbro stock. (See page 8 of text.)

FIG. 8.—MOUNT SNEFFELS, SEEN FROM STONY MOUNTAIN.

On the left is the pass between Gilpin Peak and Mount Sneffels, and below it a typical glacial cirque whose rocky floor is now almost hidden by talus. The summit of Mount Sneffels (14,158 feet) rises above the bedded volcanics of the region. The jagged and pinnacled cliffs are characteristic of the large stocks of the San Juan. (See page 8 of text.)

FIG. 9.—VIEW DOWN HOWARD FORK, FROM SOUTH OF OPHIR PASS.

In the valley is the town of Ophir, and beyond it are the crags of Ophir Needles. In the background are the summits of the Mount Wilson group, scarcely distinguished in the photograph from the line of Yellow Mountain, owing to the clearness of the mountain air. (See page 9 of text.)

FIG. 10.—SILVER MOUNTAIN AND OPHIR NEEDLES, FROM THE WESTERN SIDE OF LAKE FORK, OPPOSITE THE BELT RANCH.

In the middleground is the characteristically uneven landslide surface about the Currency mine, the shaft house appearing to the left of the center. Above the landslide surface are seen the snow-covered peaks and ridges of the volcanic series, and on the right the dark points of the Ophir Needles stock. (See page 9 of text.)

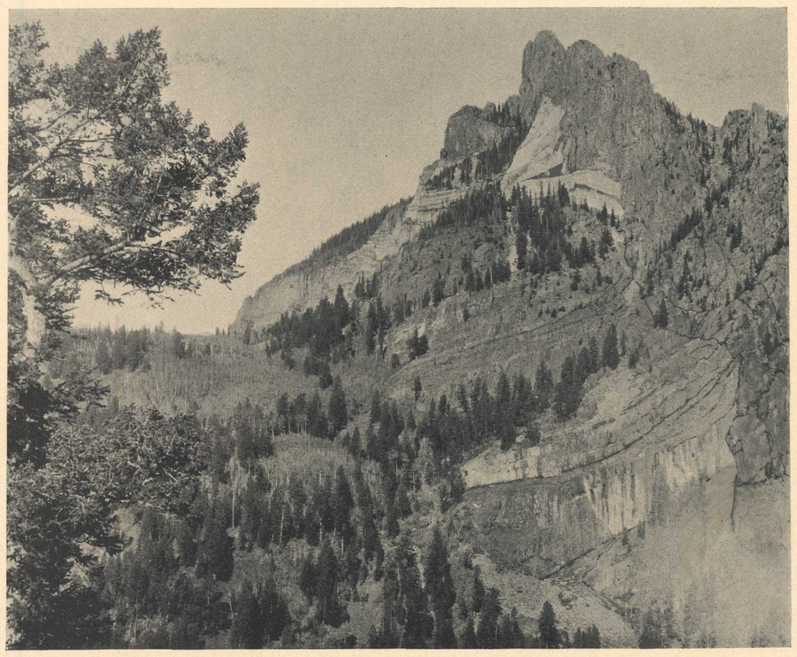

FIG. 11.—CONTACT OF THE OPHIR NEEDLES STOCK WITH SEDIMENTARY ROCKS.

View from above the railroad station at Ophir Loop, looking northeast across Howard Fork. Above is the light-colored San Miguel conglomerate, split by a short wedge of diorite-monzonite. Below are the darker, greatly indurated beds of the McElmo, whose stratification is almost obliterated near the stock. (See page 9 of text.)

FIG. 12.—CLIFF OF DIORITE-MONZONITE WEST OF LAKE FORK, FROM ABOVE OPHIR LOOP.

The cliff is entirely in igneous rock. At its top runs the Dakota sandstone, belonging normally at the base of the cliff. This is a part of the connecting arm between the stocks of Mount Wilson and Ophir Needles. (See page 9 of text.)

SPECIAL ILLUSTRATIONS

FIG. 13.—DIORITE-MONZONITE AT OPHIR LOOP, WITH INCLUDED FRAGMENTS OF VARIOUS ROCKS.

This cut is on the lower railroad grade, and the rock is equally rich in inclusions for several hundred yards. (See page 7 of text.)

FIG. 14.—A BLOCK BLASTED FROM THE RAILROAD CUT SEEN IN FIG. 13.

This view shows the fine texture of the inclosing rock, the varying textures and shades of the inclusions, and, in one fragment, a change in composition from amphibolite to coarse diorite. It also represents the abundance of the inclusions. (See page 7 of text.)

FIG. 15.—PILOT KNOB AND THE CLIFF TOWARD YELLOW MOUNTAIN.

The view is southeast from a knob on the landslide block, between Leslie and Ground Hog gulches, the building on the Sulphuret No. 2 claim showing on the left. It illustrates the common details of the precipitous San Juan front within the andesitic tuff and agglomerate zone. Potosi rhyolite forms the summit of the mountain. (See page 9 of text.)

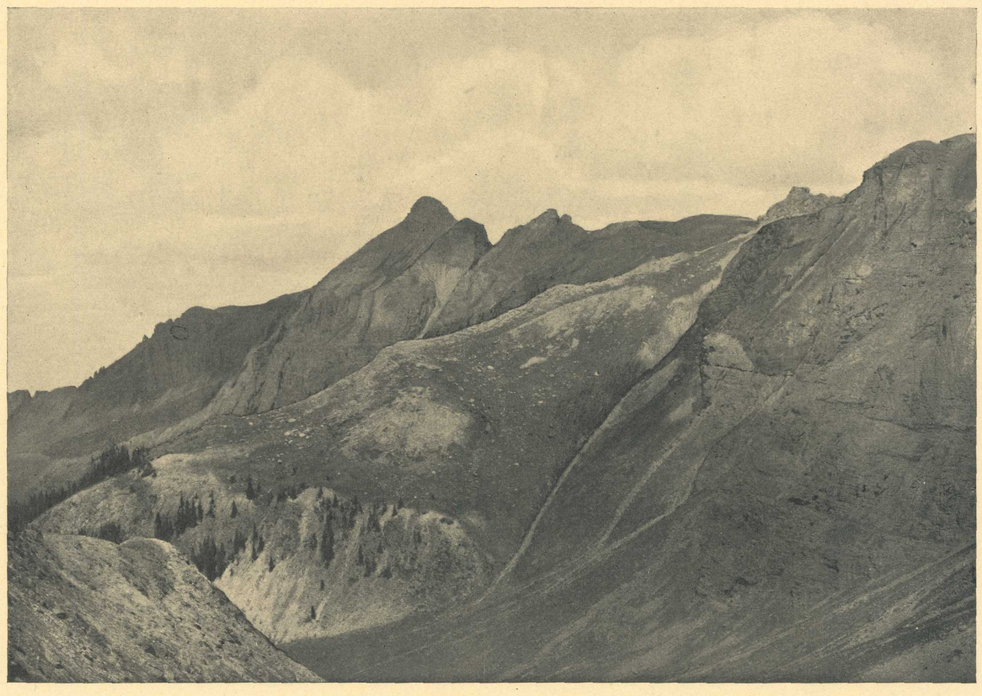

FIG. 16.—LANDSLIDE BLOCK SOUTH OF YELLOW MOUNTAIN.

The view is from the divide between Leslie and Ground Hog gulches, looking toward Yellow Mountain, and shows the upper extremity of the large slide east of Trout Lake, consisting of Potosi rhyolite, interrupting the dark cliff of San Juan tuff, which is a continuation of that seen in fig. 15. (See page 10 of text.)

FIG. 17.—THE MOUNT WILSON GROUP, AFTER AN EARLY SNOWFALL, SEEN FROM THE DOLORES VALLEY AT THE NORTHEASTERN BASE OF FLAT TOP.

The illustration brings out the alpine character of this isolated outlier of the San Juan. The rugged summits, within the diorite-monzonite stock, reach the altitude of 14,210 feet. The left-hand shoulder is indurated San Miguel strata. Below are the gentle shale slopes descending to the Dolores Canyon. (See page 12 of text.)

FIG. 18.—THE MOUNT WILSON GROUP, FROM THE DAKOTA LEDGE WEST OF MILL CREEK, LOOKING SOUTHWEST.

In the foreground is the Pleistocene lake bed, below Telluride; beyond it the Dolores Plateau, cut by Bilk Creek and Lake Fork; in the distance rise the peaks of the Mount Wilson group, and on the right is Dolores Peak. (See page 12 of text.)