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

COLUMNAR-SECTION SHEET

COLORADO
LA PLATA QUADRANGLE

GENERALIZED SECTION OF THE SEDIMENTARY ROCKS OF THE LA PLATA QUADRANGLE.
SCALE: 1 INCH = 400 FEET.

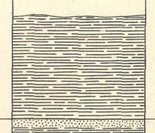
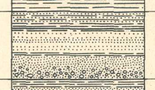
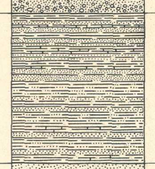
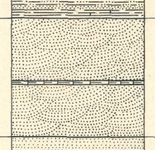
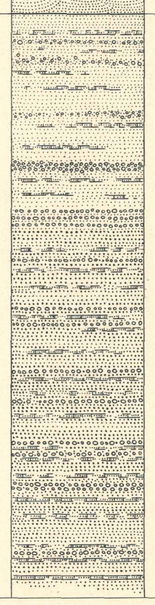
Period.	Formation Name.	Symbol.	Columnar Section.	Thickness in Feet.	Character of Rocks.
CRETACEOUS	Lewis shale.	Kle		300+	A series of gray or drab clay shales, very similar to the Mancos shale in character. The shales include, in varying abundance, thin calcareous lenses or concretions of impure limestone containing some of the fossils known in the Mancos shale. Only 200 or 300 feet of the formation now remains in this quadrangle. In the adjoining Durango quadrangle a total thickness of 2000 feet is shown.
	Mesaverde formation.	Kmv		1000	An alternating series of gray or yellowish quartzose sandstones and sandy shales. In the lower portion is a massive, coarse, cross-bedded sandstone, which causes the most prominent scarp of the Mesa Verde. Above this a variable complex of sandstones and shales contains a number of productive coal seams. Invertebrate fossils, of which a list is given in the text, occur at numerous horizons. A few fossil plants have been found.
	Mancos shale.	Kmc		1200	Soft, dark-gray or almost black, carbonaceous clay shales, containing thin lenses or concretions of impure limestone. Embraces the Colorado group and a portion of the Pierre division of the Montana. Fossils occur more or less abundantly at several horizons. The species identified are enumerated in the text.
	Dakota sandstone.	Kd		100–300	Gray or rusty-brown quartzose sandstone, with a variable conglomerate containing small chert pebbles at or near the base. Carbonaceous shale partings occur at several horizons. Coal of poor quality is locally present in these shales. Indistinct fossil leaves occur sparingly.
JURATRIAS	McElmo formation.	Jme		400–500	A complex of alternating friable, fine-grained, yellowish or gray sandstones and variegated shales. The sandstones are seldom more than 20 feet in thickness. They often include flakes of greenish clay or shale. The shales are chiefly green in color, but may be pink, dark red, or chocolate brown. Some shale layers are sandy and others highly calcareous. No fossils have been found in the McElmo strata of this quadrangle.
	La Plata sandstone.	Jlp		300–400	Consists principally of two very massive, friable, white sandstones, with a narrow band of dark limestone or calcareous shale between them. The sandstones are quartzose, of even grain, distinctly cross bedded, and form massive cliffs where exposed. A delicate net veining with white quartz is characteristic. No determinable fossils have been found.
	Dolores formation.	Jd		1700+	A series of reddish sandstones, grits, and conglomerates with persistent calcareous cement. The upper third of the formation is finer grained and predominantly brighter red in color than the lower part. Many of the strata are sandy marls and may locally become dense sandy limestones, mottled red and gray, with conchoidal fracture. Fine limestone conglomerates occur very variably in this upper third, and in them are found abundant teeth of a crocodile (*Belodon*) and of a megalosauroid dinosaur, with a rare gasteropod shell similar to *Viviparus*. The lower two-thirds of the formation consists of alternating arkose sandstone and conglomerate, the pebbles of the latter being of granite, gneiss, Algonkian quartzite, and schist, and, rarely, of a dark dense porphyry. The exposed thickness of the formation in this quadrangle is about 1700 feet, while the total thickness, seen in the adjacent Durango quadrangle, is about 2000 feet.

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ILLUSTRATION SHEET

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FIG. 1.—VIEW FROM BALD KNOB, LOOKING NORTH ALONG THE EAST FACE OF THE LA PLATA MOUNTAINS.

The steep slope on the left belongs to Lewis Mountain. The metamorphosed Dolores beds are steeply upturned and seamed by many dikes. Beyond these slopes appears the summit of Snowstorm Peak. The projecting shoulder of the middle ground exhibits nearly horizontal Dolores strata, with several intrusive sheets of porphyry. The distant peaks belong to the western part of the San Juan Mountains.

FIG. 2.—VIEW FROM BALDY PEAK, LOOKING SOUTHEAST TOWARD DURANGO.

The prominent valley is that of Lightner Creek. The prominent pointed ridges represent remnants of a sloping mesa caused by the Mesaverde sandstones. Below the scarps are the exposures of the homogeneous Mancos shales.

FIG. 3.—VIEW SOUTHWEST FROM THE RAMPART HILLS, SHOWING THE DOLORES PLATEAU, THE MESA VERDE, AND THE EL LATE MOUNTAINS

The nearly level floor of the plateau is underlain by the Dakota sandstone, upon which are rounded knolls and ridges of Mancos shale. On the left appears the Mancos Valley as it cuts into the Mesa Verde. The escarpment of the Mesa Verde is caused by the heavy sandstones of the formation of the same name. Ute Peak, the most prominent summit of the El Late Mountains, appears at the extreme right of the view.

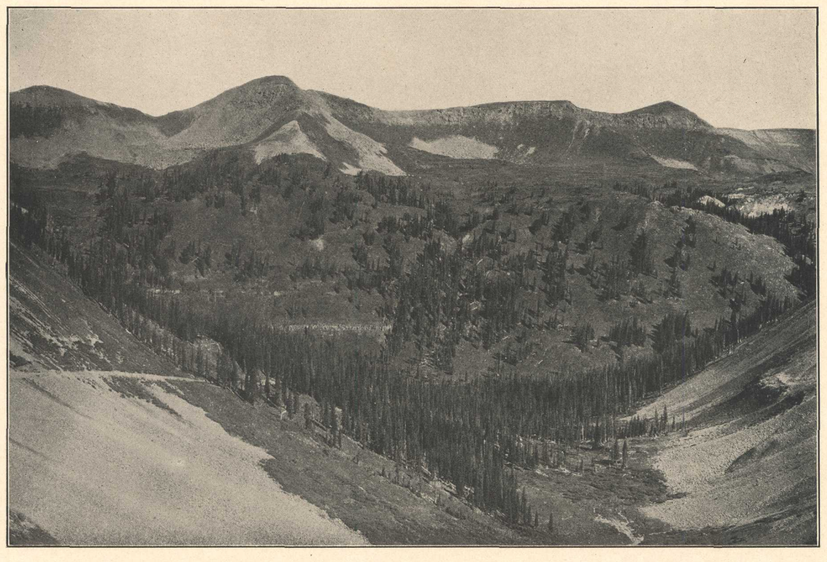

FIG. 4.—INDIAN TRAIL RIDGE, AS SEEN FROM THE EAST, LOOKING ACROSS THE LA PLATA VALLEY FROM SILVER LAKE BASIN.

The view shows the light-colored La Plata sandstone forming the top of the ridge, the basins excavated in the Dolores strata immediately below it, and the steep western slope of the main La Plata Valley.

FIG. 5.—THE SHARKSTOOTH, FROM THE EAST LOOKING ACROSS BEAR CREEK.

The summit of this most northern point of the La Plata Mountains is due to an intrusive sheet in the Mancos shales. The débris from the disintegration of that sheet spreads out over the soft shales as a wide field of slide rock. A notable talus slope from the upper cliffs partially conceals the outcrops of the Mancos shales, the Dakota sandstone, and the Lower McElmo formation, within which is a thick intrusive sheet of porphyry.

FIG. 6.—A RAVINE UPON THE NORTHEAST SLOPE OF GIBBS PEAK.

The rock within which this ravine is excavated is brecciated and iron-stained porphyry Erosion is progressing very rapidly at the present time. The site of this ravine was once forest covered.

ILLUSTRATION SHEET

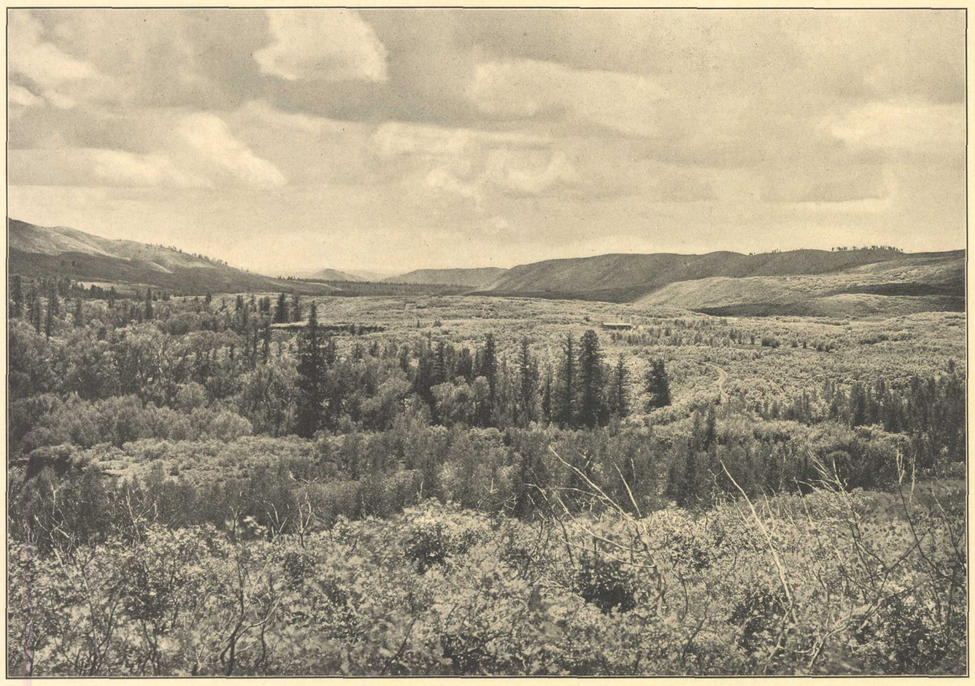

FIG. 7.—VIEW DOWN THE LA PLATA VALLEY FROM THE ENTRANCE TO THE MOUNTAINS.

The level ground in the center of the view belongs to the terrace called the Gold Bar. The present stream bed of the La Plata is on the left. The sky line represents the principal sandstone horizon of the Mesaverde formation. In the gap on the left is situated the station Hesperus. Beyond that may be seen another strong terrace line.

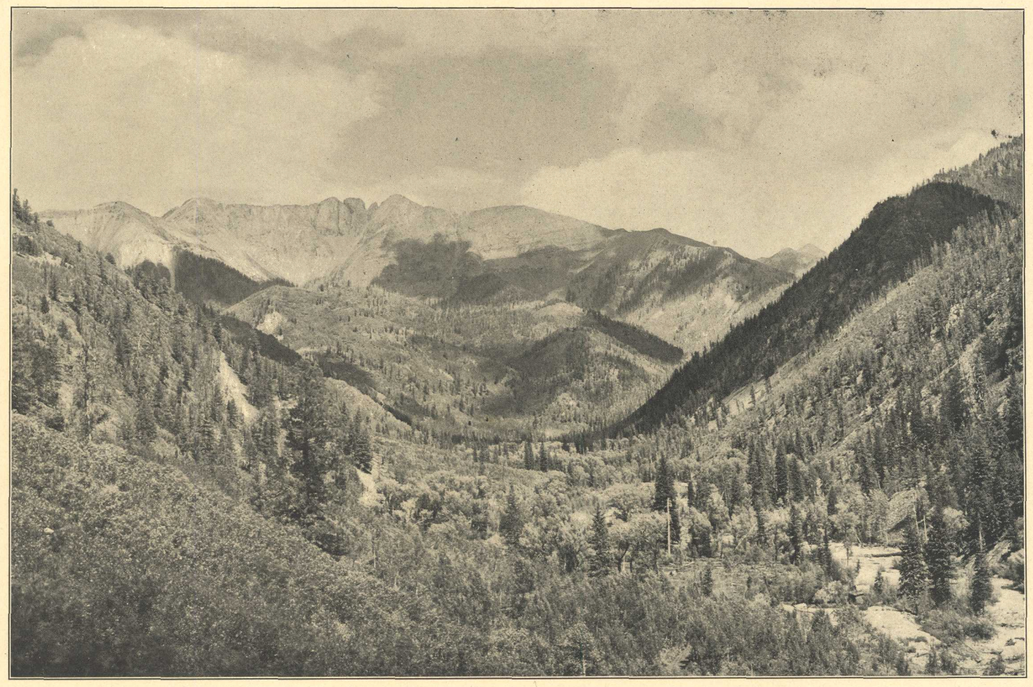

FIG. 8.—VIEW UP THE LA PLATA VALLEY FROM THE ENTRANCE TO THE MOUNTAINS.

The view shows the U-shaped valley of the La Plata. To the left of the center are Babcock and Spiller peaks, where a stock of monzonite causes the more rugged forms.

FIG. 9.—VIEW DOWN THE LA PLATA VALLEY FROM THE DIVIDE AT ITS HEAD.

This view shows how wide and deep this valley is at the very heart of the mountains. The steep slopes on the right are characteristic of both sides of the valley. The summits near the center are Parrott and Madden peaks, the former capped by porphyry, the latter by the light La Plata sandstone.

FIG. 10.—THE WESTERN SUMMITS OF THE LA PLATA MOUNTAINS FROM THE DIVIDE AT THE HEAD OF THE RIVER.

This view is panoramic with fig. 9. It shows the rugged character of the summits within the monzonite stocks. Near the center is Mount Moss. The sharp point on the left is Diorite Peak. Banded Mountain and Hesperus Peak are on the right.

FIG. 11.—THE HEAD OF THE WEST MANCOS RIVER FROM JACKSON RIDGE, SHOWING HESPERUS PEAK, MOUNT MOSS, AND SPILLER PEAK.

In Hesperus Peak, on the left, are many intrusive sheets of porphyry intercalated in the Mancos shales. The monzonite stock of Mount Moss, in the center of the view, sends off a wedge-like arm which upturns the shales and sheets of Hesperus Peak. On the right is Spiller Peak, the summit of which is also formed of monzonite, which has greatly indurated the strata of the McElmo formation forming the cliffs seen in the view. The loose rock of the foreground belongs to the syenite-porphyry sheet of Jackson ridge. The cliffs in the gorge of the West Mancos belong to the indurated La Plata sandstone.