DESCRIPTION OF THE GOLD BELT.

GEOGRAPHIC RELATIONS.

The principal gold belt of California includes a portion of the Sierra Nevada lying between the parallels of 37° 30' north and 40° of north latitude. This area is bounded on the west by the Sacramento and San Joaquin valleys, and on the east by a diagonal line connecting the northwestern end of San Joaquin valley with the eastern end of the Great Valley. The northeastern boundary of the belt lies in the neighborhood of the parallel of latitude 40°. This area is part of the range, while to the south the productive region narrows to small dimensions, continuing as a narrow strip for some distance south of latitude 37° 30'. The western section of the range is comparatively barren. North of the forty-ninth parallel the range is not without deposits, but the country is flooded with lakes which effectually bury the larger part of them.

GENERAL GEOLOGY.

The rocks of the Sierra Nevada are of many kinds and many periods of occurrence. They have been formed in part by deposition beneath the sea and in part by intrusion as igneous rocks, or as the result of folding and metamorphism. The older, igneous rocks form the older of the sequence and are generally bordered each by a zone of greater metamorphism. The general trend of the range, but great masses of granite and other igneous rocks have been intruded among the metamorphic formations. Among these granitic rocks is the famous Sierra Nevada batholith of Nevada, California, which is the oldest of the series. This batholith is the product of an ancient period of igneous activity and is of great importance the Auriferous gravels.

Auriferous gravels are known in the Sierra Nevada from the Forty-ninth parallel north to 37° 30' south, for a distance of 250 miles. These gravels consist of sandstone and clay-slate, with occasional limestone lenses. On the maps of the Gold Belt region the gravels are shown in white, with outliers in the western part of the range, and are contoured on the large-scale maps. The gravels occur in the beds of streams and in the waters of a shallow bay occupying a narrow strip for some distance south of latitude 37° 30'. The gravels are narrow and are contoured on the large-scale maps. The gravels occur in the beds of streams and in the waters of a shallow bay occupying a narrow strip for some distance south of latitude 37° 30'.

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small and scattered areas in the southern part of the Gold Belt, increasing in volume to the north until, north of the forty-ninth parallel, they cover almost the entire country. They were extruded mainly along the crest of the range, which still is crowned by the remnants of the Neocene volcanoes. An addition to the gold deposits of the range, in the form of gold-quartz veins and irregular thermal impregnations, attended this period of volcanic activity.

When the lava burst out they flowed down the river channels. The earlier flows were not sufficient to fill the streams, and became inter-bedded with gravels. They are now represented by layers of rhyolite and rhyolite-tuffs, sometimes altered to "pipe-clay." The later andesitic and basaltic eruptions were of great volume, and for the most part completely choked the channels into which they flowed. The rivers were thus obliged to seek new channels—substantially those in which they now flow.

Fossil leaves have been found in the pipe-clay, and in other fine sediments at numerous points. Magnolias, lauris, figs, poplars, and oaks are represented. The general character of the flora is thought to indicate a warm and humid climate, and has been compared with the present flora of the South Atlantic Coast of the United States.

The Neocene upwarp.

In the latter part of the Neocene period a great dislocation occurred along a zone of faulting at the eastern base of the Sierra Nevada, and the grade of the western slope of the range was increased. These faults are sharply marked from Owens Lake up to Hesey Lake. There was also a series of faults formed apparently at the very close of the Neocene within the mass of the range in Plumas County. Near the crest the Sierra Nevada is intersected by a system of fissures, often of striking regularity; it is one of the most perfect that has been drawn in other parts of the world between these periods. The Sierra, from an elevation of about 5,000 feet upward, was long buried under ice. The ice widened and extended the canyons of pre-Cambrian topography and removed enormous amounts of loose material. It seems otherwise to have protected from erosion the area it covered and to have accentuated the steepness of lower slopes. Small glaciers still exist in the Sierra.

During the earlier part of the Pleistocene period a great lake evidently was drained and alluvial deposits were spread over the valley. There is no valid reason to believe that the central and southern part of the Sierra was covered by any important dynamic disturbance during the Pleistocene period, but renewed faulting with small throws has taken place along the eastern base of the range in very recent times.

IGNeous ROCKS.

Rocks of igneous origin form a considerable part of the Sierra Nevada. The most abundant and continuous rocks there are of granitic character. Rocks of the granitic series are believed to have consolidated under great pressure to the extent of forming granites at the time of great upheavals; they are thus deep-seated rocks, exposed only after great erosion has taken place.

The rocks called diabase and augite-porphyry on the Gold Belt maps are not usually intrusive, but largely represent surface lavas which have been folded in with the sedimentary rocks and correspond to modern basalt and augite-andesite. Rocks of hornblende andesite are associated with diabase and diabase-andesite.

Sierra Nevada the diabases and diabase-andesites are of pre-Neocene age, and contain in most cases secondary minerals, such as epidote, zoisite, serpentine, and chlorite. The unaltered equivalents of these rocks—basalt, andesite, dacite, and rhyolite—are in the Sierra Nevada, chiefly of Neocene or later age.

Traps are volcanic ashes formed by explosions accompanying the eruptions. Mixed with water, such materials form mud flows; and when volcanic ashes fall into bodies of water they become regularly stratified sediments to form the volcanic deposits of the world. Tuffaceous breccias contain angular volcanic fragments cemented by a consolidated mud of volcanic ash.

GEOLOGY OF ROCK NAMES.

The names in which the rocks applied to igneous rocks have been employed by geologists have varied and is likely to continue to vary. The names in which the names are employed in this folio is as follows:

- Peridotite—A granular intrusive rock generally composed principally of olivine and pyroxene, but sometimes of olivine alone.
- Serpentinite—A rock composed of the mineral serpentine, and often containing unaltered remains of pyroxene or olivine. Serpentinites is usually a decomposition product of rocks of the peridotite and pyroxene series.
- Pyroxenite—A granular intrusive rock composed principally of pyroxene.
- Gabbro—A intrusive rock consisting of sodaline or lime feldspars and pyroxenes, or more rarely hornblendes.
- Diorite—An intrusive or effusive rock composed of sodaline feldspar (often labradorite) and pyroxenes (more rarely hornblendes). The feldspars are lath-shaped. The pyroxene is often partly or wholly converted into green, fibrous hornblendes or urinite. From this change, also frequent in gabbros rocks result which are referred to as urinite-diabase or urinite-gabbro.

Gneisses—A granular intrusive rock consisting of sodaline or lime feldspars and pyroxenes, or more rarely hornblendes. The feldspars are lath-shaped. The pyroxene is often partly or wholly converted into green, fibrous hornblendes or urinite. From this change, also frequent in gabbros rocks result which are referred to as urinite-diabase or urinite-gabbro.

- Basalt—An intrusive or effusive rock consisting of sodaline feldspar and quartz, usually with some amount of hornblende and brown mica.
- Andesite—An effusive porphyritic rock of Tertiary or later age. The essential constituents are alkali feldspars and quartz, usually with a small amount of biotite or hornblende in a groundmass, which is often glassy.

- Rhyolite—An effusive rock of Tertiary or later age. The essential constituents are alkali feldspars and quartz, usually with a small amount of biotite or hornblende in a groundmass, which is often glassy.

- Quartz—Syenite—An effusive or intrusive rock consisting of sodaline feldspar and quartz, usually with a small amount of hornblende and brown mica.

- Aplitic-A granular intrusive rock composed of sodaline feldspar, quartz, or more rarely hornblende.

- Granodiorite—A granular intrusive rock having the habitus of granite and carrying feldspar, quartz, biotite, and hornblende. The sodaline feldspars are usually considerably and to a variable extent in the alkali feldspars. This granodiorite rock occupies a position intermediate between a granite and a quartz-diorite, and is in fact closely related to the latter. The large cross-cutting by it and the constancy of the type justify the special name.

- Granites—A granular intrusive rock composed of quartz, alkali and sodaline feldspars, mica, and sometimes hornblende.
- Monzonite (also called Granodiorite)—A granitoid rock usually occurring as dikes, and consisting principally of quartz and alkali feldspar.
- Syenite—A granular intrusive rock composed chiefly of alkali feldspars, usually with some sodaline feldspars and hornblende or pyroxene.
- Amphibolite, amphibolite-schist—A massive or schistose rock composed principally of green hornblendes, with smaller amounts of quartz, feldspar, epidote, and chlorite, and usually derived by metamorphic processes from augite-porphyry, diabase, and other basic igneous rocks.

- Augite-porphyry—A large intrusive porphyritic rock with larger crystals of augite and sodaline feldspars in a finer groundmass composed of the same constituents.
- Hornblende-porphyry—A granular or effusive porphyritic rock consisting of sodaline feldspars and hornblende in a fine groundmass.

- Quartz-porphyry—A intrusive or effusive porphyritic rock which differs from quartz-porphyry in containing alkali feldspars in excess of sodaline feldspars.
- Rhyolite—An effusive rock of Tertiary or later age. The essential constituents are alkali feldspars and quartz, usually with a small amount of hornblende and brown mica.
- Andesite—An effusive porphyritic rock of Tertiary or later age. The essential constituents are sodaline feldspars (chiefly oligoclase and andesine) and ferromagnesian silicates (hornblende, pyroxene, or biotite), in a groundmass of feldspar microclines and magneiste, usually with some glass. The silico is ordinarily above 56 per cent. When quartz is also present the rock is called a dacite.
- Basalt—An effusive rock of Tertiary or later age, containing basic sodaline feldspars, much pyroxene, and usually olivine. The silica content is usually less than 56 per cent. It is often distinguished from andesite by its structure.
- Trachyte—An effusive rock of Tertiary or later age, containing basic sodaline feldspars, much pyroxene, and usually olivine. The silica content is usually less than 56 per cent. It is often distinguished from andesite by its structure.
DESCRIPTION OF THE DOWNIEVILLE QUADRANGLE.

TOPOGRAPHY.

The Downieville quadrangle embraces a portion of the crest of the Sierra Nevada lying just south of the forest boundary. The quadrangle is bounded on the west by the Sierra Buttes and on the east by Deer Lake, the rocks of the higher crest of the range, and which is separated from the Great Basin only by the lower, eastern crest.

This second crest extends from Honey Lake southeast across the Sierra Nevada range, which lies immediately east of the Downieville quadrangle, where it is a very steep, but this is not true of their tributaries, which flow in various directions.

The Downieville quadrangle have a western cuesta, but this is not true of their tributaries, which flow in various directions.

In the central area, and to the southeast, the Sierra Buttes and Eureka Peak is particularly attractive. One of them is pictured on the page of the adjacent quadrangle, fig. 4, of the number of these lakes serves as reservoirs for ditches which supply the neighboring gold mines with water.

GEOLoGY.

Bed-rock series.

The Redrock series consists of sedimentary rocks which were turned into a nearly vertical position during or before the post-Juratrias deformation, together with the associated igneous rocks.

The sedimentary rocks of this period represent beds of clay, sand, and gravel which have been subjected to intense metamorphism. These beds were originally horizontal, but have since been folded and greatly compressed by forces acting chiefly from the NNE and SSW. They have also been subjected to erosion, so that the upper parts of the sediments have disappeared. Interstratified in these sediments are layers of diabase and tuffs, showing that volcanic eruptions occurred while the sediments were being deposited. Irregularly intruding the sedimentary rocks are the included volcanic layers which are masses, and dikes of various granular igneous rocks, such as granite and gabbros.

Auriferous slate series.

Calaveras formation.—In the Downieville quadrangle there are extensive areas of sedimentary rocks of the Auriferous slate series, of which, excepting the Juratrias rocks of the Milton formation and the upper Carboniferous beds of the Calaveras formation, are placed in the Calaveras formation. This has been done largely on general stratigraphic evidence, for fossils have been found in the Milton formation only by the lower, eastern crest.

Having many slopes with angles of 30° from the horizon. The highest elevation is the main peak of the Sierra Buttes, in the southeastern section, which has an elevation of about 2400 feet.

The Middle Fork of Feather River, which crosses the central part of the quadrangle, is peculiar in that it, valley is cut across the main Sierra Nevada range. The sources of this river is in Sierra Valley, which lies immediately north of the higher crest of the range, and which is separated from the Great Basin only by the lower, eastern crest.

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chemical changes, mostly from peridotite and pyroxenite. It has also been shown that there are some slight departures from basic igneous rocks, chiefly pyroxenites. Such schists are often found associated with peridotite and being alteration products of the same rock mass.

The largest area of serpentine is a huge dike-like mass, which continues with some interruptions through the western portion of the Downieville quadrangle south into the Colfax district. The mass extends across the Feather River to Meadow Valley and beyond, in the Bidwell Bar quadrangle. From specimens collected at many points it is known that the mother rock of this serpentine dike is a peridotite, or in places a pyroxenite. Remains of olivine and pyroxene are still to be seen in thin sections. One mile west of St. Charles ranch the rocks of this magmatic belt are chiefly talc-schists and chlorite-schists.

There are several smaller dikes of serpentine, usually in a few hundred feet in width, in the eastern part of the area of Calaveras schists which covers such a large part of the western Downieville quadrangle. Two of these dikes have a length of about 45 miles. Associated with these dikes are small masses of altered gabbro, which are enclosed in the serpentine, chiefly fresh, but are altered around the edges to fibrous amphibole. The folia are entirely replaced by chlorite-schists. The area 11 miles southwest of Bunker Hill is composed of serpentine and talc-schists. The area of magnesian rocks that surrounds the south half of the Indian Valley granite area is composed of serpentine, talc-schist, chlorite-schist, and altered peridotite, in which the original pyroxene and olivine may still be noted.

There are a few streaks of serpentine along Spiegel Garden creek. On the east side of Mohawk Valley is a small area about Johns ville. It reappears about 1.5 miles northeast of Johns ville and extends across the canyon of the Feather River to Meadow Valley and beyond, in the Bidwell Bar quadrangle. There are also a few streaks of serpentine along the northeast side of the Downieville quadrangle, where the rock is abundant. It is quite probable that all of the areas of serpentine and talc-schists are eventually connected and may be treated as one large mass, although the connection between them can not be demonstrated on the surface. At two points quartz-pyroxene-diorite occurs in a facies of quartz-greenstone. One of these occurrences is a 6, miles southeast of Mount Lupus on the west slope of the Grizzly Mountains, just above the east end of the Feather River. Another is near the town of Downieville. The other locality is about Hay Press Valley, in the southeastern part of the quadrangle.

Granodiorite and granulite.—In the southwest corner of the quadrangle there is a small area having a maximum diameter of about 2 miles, in a coarsely crystalline rock which appears to be a true granite in composition. In general it is characterized by the abundance of felspar, and the lack of hornblende. The locality is a small one, only seen in thin sections. The granodiorite is mainly composed of quartz, feldspar, and the lack of hornblende. The locality is a small one, only seen in thin sections. The granodiorite is mainly composed of quartz, feldspar, and mica.

About 2 miles east of Downieville, in the canyon of the North Yuba, is a small mass of granite similar to the Harris Meadows area on the east side of the Yuba River. This rock is distinctly different from the Harris Meadows granite, and is seen only on account of the great abundance and variety of dikes that cut the surrounding rock. Indian Valley, on the North Yuba, is a small area of granite, which is seen in thin sections, and is seen only on account of the great abundance and variety of dikes that cut the surrounding rock. Indian Valley, on the North Yuba, is a small area of granite, which is seen in thin sections, and is seen only on account of the great abundance and variety of dikes that cut the surrounding rock. Indian Valley, on the North Yuba, is a small area of granite, which is seen in thin sections, and is seen only on account of the great abundance and variety of dikes that cut the surrounding rock. Indian Valley, on the North Yuba, is a small area of granite, which is seen in thin sections, and is seen only on account of the great abundance and variety of dikes that cut the surrounding rock.Indian Valley, on the North Yuba, is a small area of granite, which is seen in thin sections, and is seen only on account of the great abundance and variety of dikes that cut the surrounding rock.
Neocene lake deposit, consisting of beds of clay, is found in the Seventeenth Annual Eeport of the Department of Geology, which shows the auriferous gravels. Volcanoes situated on the banks of the Feather River, about 1^ miles north of Mount Pleasant and then north of Poverty Hill, which are covered by a rubble of andesite boulders on top, may be downthrown portions of the Hepsidam. The Blue Ledge gravel mine is on the ridge of Poorman Creek, 2^ miles northeast of Mount Pleasant, which has been mined. There is also evidence of the point and Poverty Hill, where the gravels have been covered by fragmental andesite, forming a channel over the lava. The gravel shows evidence of its former covering of gravel by hydraulic wash.-ing. The gravel of the Neocene river just described is well exposed over Mount Pleasant. The gravel of the Neocene river just described is well exposed over Mount Pleasant.

The channel between Laporte and Gibsonville is perhaps a part of the Laporte channel, but there is some doubt about it. From Gibsonville to Cold Canyon is a mass of gravel, including several deposits, and is a part of the Laporte channel. The Grizzly Hill gravel area, at the south edge of the andesitic belt, has been mined. There are some gravel deposits that have been mined.

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The basin area of the point-one-half mile north of the summit of Huckle Peak presents the characteristic of having filled with clay and fine wash. This area has been partially eroded. There is also a small area on the western slope of the Grizzly Mountains, south of the fortieth parallel, which appears to have been a source of erosion. There is still on the summit of the mountain some red, scoriaceous lava, which may have formed part of the crater. It is thought that the eruptions of this late basalt took place in very early Pleistocene time, after the present drainage system had been initiated. It largely overlies scoriaceous breccia, and appears to have flowed down slopes that existed at the time of the basaltic eruptions. It occurs at numerous points in the large volcanic area north of Mohawk Valley, as at Big Hill and Poomen Peak. There is a large flow just southeast of Mohawk Valley, and another at Huckle Peak. There is a considerable mass of it on the south end of the ridge west of the head of Woodruff Creek, and it is found at several points on the ridge between Fiddio and Grinding Creek. It is found at various points in the national parks area 45 miles south of Tower Rock on the west slope of the Grizzly Mountains, one mile of Belts Bar, and one north of the present drainage system. It is evident that this late dacitic breccia is scattered over nearly the entire Donville quadrangle. The dacitic breccia is composed of basaltic lava, tuff, and clays. The basaltic lava is the most abundant and is the most common type of rock found in the area.

The sharpness of the line separating the bare glacial surfaces of the rocks that were covered with glacial material is very noticeable in this region. The line of contact is very well seen in the canyon which contains the Sierra Buttes. From the upper (east) side of the lower Saranola Lakes (see fig. 5) to near the top of the buttes, all are bare, glaciated rock, with only occasional cairns. The normal material of the moraine south of this canyon begins at the west end of the lake and extends diagonally up the ridge south of the lake, while to the east of the line the ridge is composed entirely of glacial debris. The same rock forms one continuous area of moraine material from Gold Lake to the southeast slope of the Sierra Buttes. All of the land to the west of these moraines appears to be underlain by moraine stuff. The valley of the streams to the west of the high Buttes and Eureka Peak appears to be entirely filled with moraine material. As is shown on the structure-section sheet, the bed of quartz-porphyry and porphyry-tuffs and the rocks of the Milton formation are all of which are supposed to be of Jurassic age.

The large area of the Calaveras formation lying just southeast of the Sierra Buttes may be regarded as a mountain basin with associated igneous masses. Forming the crest of the Grizzly Mountains, at least in the southern part, are the beds of quartz-porphyry and porphyry-tuffs and the rocks of the Milton formation, all of which are supposed to be of Jurassic age. An extensive sheet of quartz-porphyry and quartz-porphyry-breccia forms the crest and the eastern slope of the Sierra Buttes. The original surface of the Buttes is nowhere apparent, except where interbedded with layers of alluvial sediments. As is shown on the structure-section sheet, the beds of quartz-porphyry and porphyry-tuffs are the red slates, sandstones, and tuffs of the Milton formation. Dikes of quartz-porphyry which may be regarded as the Buttes may be regarded as a mountain basin with associated igneous masses. Forming the crest of the Grizzly Mountains, at least in the southern part, are the beds of quartz-porphyry and porphyry-tuffs and the rocks of the Milton formation, all of which are supposed to be of Jurassic age.
rock, often with large, scattered olivines. There is here evidence that the Sierra Buttes formed a mountain mass in Neocene time, the present altitude perhaps 400 feet greater than that of the area of this rock is that forming the upper two-thirds of the Grizzly Mountains, one nonth of Bells Peak. The terrace on which Johnsville is situated, the moraine material from Gold Lake to the southeast of this canyon begins at the west end of the lake, while to the east of that line the ridge is composed entirely of glacial drift. Deposits at the high point of Big Medicine hill, west of Gold Lake, have an elevation of about 5100 feet. Lower summer months, the one in the region northeast of Onion Valley; on Mount Ingalls, all the doleritic basalts is massive.

eral andesite just east of Bassett, at the mouth of Howard Creek, and 2 miles north of Bassett, where it is columnar, is much of the columnar type, but may be distinguished from the coarser portion of the fine-grained hypersthene-andesite, as the porphyritic andesite. This fine-grained hypersthene-andesite occurs also as a distinct dike cutting the clay-slates in the bed of Canyon Creek 1 miles northeast of Bassett. This dike extends up the south slope, gradually broadening, and forms a conical butte 1 mile south of East Flat, where it may be in part lenticular. There are several small areas near the summit of the mountain some red, scoriaceous lavas, which may form part of the crater rim. It is thought that the eruptions of this late basalt took place in very early Pleistocene time, after the present drainage system had been initiated. It largely overlies andesitic breccia, and appears to have flowed down slopes that existed at the time of the basaltic eruptions. It occurs at numer- 

GLACIAL PROCESSES.

Glacial moraines and drift.—The ridge in the Bluff Creek quadrangle, an area composed of basalt, has a marked slaty fracture or laminated structure.

Definite slaty fracture or laminated structure. Clearly these andesitic lavas were erupted along the line of the ancient fissures. The lava was probably of a more fluid nature.

The fine-grained hypersthene-andesite forms a fragmental andesite dike that crosses Canyon Creek at Poker Flat and at several places northwest of that village (fig. 1).

Sierra Buttes dip eastward at angles of 35° to 60°. The general dip of the Grizzly Mountains for several miles to the west of the crest of the mountains is easterly, with a slope to the north. Lying immediately southeast and slightly east, and perhaps sinistrally overlying the quartz-porphyry belt, is a strip of siltstone and sandstone, and tuffs of the Milton forma-}

Sierra Buttes, the mountains on the east side of Mohawk Valley, where well-defined terraces are not found. The best-exposed terraces are crossed by the road from Jardine to Saddle Mountain. There are also terraces on and near alluvial fans, and the lowest one of these terraces may be of some relief as far as the northwestern part of the Sierra Nevada, and the one in the region northeast of Onion Valley, where it occurs in dikes in the fragmental andesite, it is evidently later than that material, and is therefore considered as younger. The section on the map is characterized by the presence of these augite-porphyrite-tuffs in the middle and upper stages of the Grizzly Mountain series, but about Poker Flat and Table Rock and at Poker Flat, there is still on the east side of the mountain mass which was land at the time the volcanic activity began. The elevations of the fine-grained hypersthene-andesite, as the porphyritic andesite. This fine-grained hypersthene-andesite occurs also as a distinct dike cutting the clay-slates in the bed of Canyon Creek 1 miles northeast of Bassett. This dike extends up the south slope, gradually broadening, and forms a conical butte 1 mile south of East Flat, where it may be in part lenticular. There are several small areas near the summit of the mountain some red, scoriaceous lavas, which may form part of the crater rim. It is thought that the eruptions of this late basalt took place in very early Pleistocene time, after the present drainage system had been initiated. It largely overlies andesitic breccia, and appears to have flowed down slopes that existed at the time of the basaltic eruptions. It occurs at numer- 

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porphyry, angio-porphorite, and Milton series lying on the older rocks of the Grizzly Mountains and dipping westward. To the north of the footwall parallel, however, there are some sill-occurring granites in the Grizzly Mountains described by Silliman limestones, forming the Grizzly for mation of Diller, and it is not impossible that the belt of sill-silicic or mafic series may form a continuation of the amfibolite series of the Grizzly formation. While there is thus a reasonable

doubted, the angio-porphorite of both regions is of the same age, of it forms one large area.

In a general way it may be said that the strike of the older rocks in the Downieville district is to the northwest and southeast, or north and south. Local displacements, however, are not uncommon, as is the case with the mass of sediments of the Calaveras formation forming the ridge south of Canyon Creek, of which Deadwood Peak is that low elevation point. These slates in general have an east-west strike, parallel to the contact of this area of sediments with the augite porphyry above. The schistose structure developed in this amphibolite-schist, as seen along Canyon Creek and to the east of St. Louis, tris similarly along the strike of the rocks. There is no apparent explanation of the displacement of this body of Paleozoic sediment unless we regard the amphibolite-schist as an altered form of an intrusive mass, very probably pytocrystine. This amphibolite-schist is a coarse-grained variety, containing, in the lesser portion of which feldspars are

porphyritic in the Amstelite suite, at the head of Pocumau Valley. Gold is found in the Granite Incline porphyry and in the Rhyolite-porphyry. At the time of the writer's visit the gravel and明显 debris of the gravel were being washed from the gravel bed of the Bedrock - East of the range. The faulting probably took place to an elevation of the range.

Mohawk Lake, just referred to, occupied the Pliocene depression of the Mohawk Lake-Pliocene time, although at the lake this period may not have been a deep body of water. The basin could have, however, penecontemporaneously in the lake, indicating a zone of weakness, presumably established at an earlier stage of the history of the Mohawk Valley in an area of decreased elevation. The inclusion of the lake in the present mountain range is not inconsistent with the impos-

ment must have been preceded by an elevation of the range.

To the south of the Plumas Eureka the Little Granite area of Harris Meadows. At Gold Valley Mining Company's vein and the vein of the St. Johns mine; both strike northwest and dip southwest. The veins are about 5 feet wide. In the Gold Valley mine sulfides were so abun-
dant that a chlorination plant was necessary.

Faults with a small throw in Pliocene sediments are being worked near the Black Feather River opposite Howl and post-office. About a mile farther east, where most of the fossil leaves were collected, a faulted area was noted under the heading "Lake beds," a fissure was noted in the tuff and breccia beds at the time of an earthquake, about 1870. In 1890, water at the foot of a glacier was found by a prepared trench in the bed of a stream about one mile above the post-office. On Little Long Valley post-office, about 1 mile farther east, where quartz veins are numerous, but no mines of any importance are being worked there at present, the present river is about 4 miles northeast of Laporte, where the gravel deposit is covered with lava, and at many points along the levee of the river on either side of the levee, the penecontemporaneously in the lake, indicating a zone of weakness, presumably established at an earlier stage of the history of the Mohawk Valley in an area of decreased elevation. The inclusion of the lake in the present mountain range is not inconsistent with the impos-

H. W. TURNER

Geologist.

June, 1896.