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THE ARIZONA REPUBLIC

Close-ups

deposit, which seems to be in diorite, was discovered about 1899. About 1900 the mine was purchased by the present owner, the Santa Rita Mining Co., of El Paso, Tex., which soon worked it extensively and in 1901 shipped to El Paso two carloads of black chalcocite ore that averaged, it is said, about $250 to the ton. About 90 tons of ore was concentrated by the Arizona Gold-Copper Co. near by.

The property comprises a group of six claims, all of which are patented. It is said to be developed to a depth of 470 feet by tunnels, shafts, and crosscuts aggregating more than 2,500 feet of work. The company is reported to have expended more than $5,000 on the property.

THREE STAR PROSPECT.

The Three Star prospect is a quarter of a mile northwest of the Wandering Jew mine, on the north side of Apache Gulch, at an elevation of 4,770 feet. It is on a quartz vein which dips 85° S., in latite, and is opened by a shaft and three 10-foot holes. The quartz contains a little chalcopyrite and galena coated with earthy cerusite, argentite, and malachite.

TOLUACHI GROUP.

The Toluachi group, owned by Josiah Bond, whose camp is 1¼ miles north of Alto, comprises 19 claims lying north and east of the camp. The country rock is a somewhat tuffaceous latite of dark-green color. Along its eastern border, however, the formation contains so much granite porphyry, apparently in the form of included bowlders and pebbles, that it has been mapped as granite porphyry. The rock is cut by a large number of small fissures which trend about east, the principal strike being N. 85° W. As many as 50 small veins were noted in a distance of three-fourths of a mile north from Bond's cabin. The quartz veins are mostly rather small but range up to 4 feet in width. They are stained with iron and manganese and in places show copper carbonates at the surface. Some of the claims are said to be bonded to eastern people. Among the principal prospects are the Jersey Girl, Silver Sally, and Merry Widow.

The Jersey Girl prospect is located just east of Bond's cabin on a 5-foot lode which at the surface dips 80° S., in latite breccia, and occupies a well-defined fissure 4 to 6 feet wide, filled mostly with gouge and crushed rock. Toward its middle, however, as shown in figure 24, it contains two small veins or pay streaks from 2 to 6 inches in width, composed principally of a quartz-calcite-siderite gangue with a little rhodochrosite and rhodonite. The filling of the lode in general, not including the two quartz veins or pay streaks, is said to average $20 to the ton in copper and silver. One of the

veins or pay streaks is composed chiefly of copper and lead stained quartz showing galena and seemingly a little gray copper. Some of it is banded, but postmineral movement has crushed it. The principal ore minerals are galena, proustite, tetrahedrite, horn silver, embolite, bromyrite, chalcopyrite, chalcocite, malachite, azurite, cuprite, argentite, and tennantite.

The richest ore is said to occur on the 80-foot level, where the two pay streaks join or intersect. Some of it carries 10 per cent in copper, 30 per cent in lead, and 120 ounces to the ton in silver. On the north wall the ore contains much white mica. Between the two pay streaks sericitic mica still remains, but the filling is mostly quartz, and it is stained with manganese and iron. On the 90-foot level chlorite is associated with the sericite. On the south wall, where also the material is much iron stained, it apparently runs higher in silver.

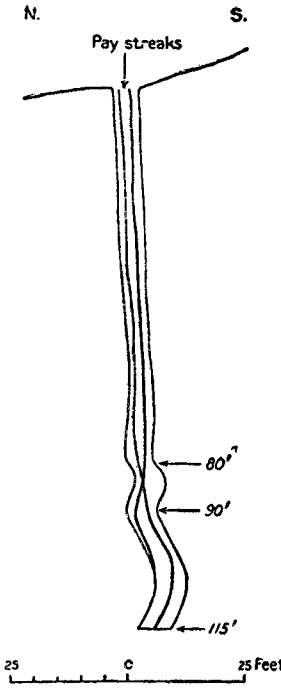


FIGURE 24.—Cross section of Jersey Girl shaft and veins.

The Silver Sally prospect is on a vein which strikes N. 60° W. and is opened by a 280-foot shaft and a 100-foot drift to the east on the 220-foot level. The vein is 15 feet or more in width. It consists principally of iron-stained silicified diorite, which, however, contains a 4-foot band of iron and lead stained quartz that carries galena and sphalerite. Some of the ore, which probably contained horn silver or cerargyrite, is said to have averaged 50 ounces in silver to the ton.

The Merry Widow prospect is located in Bond Canyon at an elevation of 4,970 feet, on the Merry Widow-Badger vein, which dips steeply to the south in andesite breccia and is opened by a 100-foot shaft, from the bottom of which a 45-foot drift has been run to the west, with a 20-foot winze sunk at the face. The vein contains ore, of which a shipment of 5 tons is said to have averaged 8 per cent of lead and 72 ounces to the ton in silver. The ore also contains some copper and zinc, and for the latter mineral the shipment was penalized. The ore minerals are principally galena, sphalerite, and chalcopyrite, contained in a quartz-calcite gangue.

ARIZONA-PITTSBURG MINE.

The Arizona-Pittsburg mine is located 3½ miles north of Salero

A Silver Bearing Diorite in Southern Arizona

Silver Considered an Original Constituent of the Rock, and Is Inclosed in Secondary Magnetite. Ferro-Magnesian Minerals Much Altered

BY JOSIAH BOND*

The discovery of silver in altered diorite is interesting as describing a new occurrence of silver. Several years ago I determined the presence of copper in small quantities in the First Mountain trap of New Jersey, where it was probably a primary mineral, and following Vogt's suggestion, showed that this was probably the source of the copper deposits underlying that rock mass. In view of the exploitation of what are called mineralized porphyries for copper in these days, this occurrence is suggestive of the possibility of low-grade silver deposits of the same general character. The determination of the rock is by Frederick W. Apgar, of Jamaica, N. Y., and is as follows:

General Characteristics

"In hand specimens the rock presents a granular, mottled appearance, of rather fine grain, greenish gray in color on fresh fracture, weathering to a brownish color on exposed surfaces; the alteration due to weathering extends only slightly beneath the surface.

"A close megascopical examination shows that the prevailing color is due to irregular grains of a green mineral inclosing, in many cases, minute specks of magnetite. In the lighter colored areas the striations of a plagioclase feldspar can be detected with orthoclase and occasionally minute grains resembling ondary as will be shown later; then in the order of development, augite, hornblende and biotite and finally plagioclase; and as a binder, filling the interstices, orthoclase and a small amount of quartz.

The Feldspars

"The most abundant constituent of the rock is plagioclase, which occurs in characteristic elongated hypidiomorphic forms varying in length from about 0.2 to 1.7 mm. Twinning, according to the albite law, is universally common. In some cases polysynthetic twinning after both the albite and pericline laws was observed. The majority of the crystals appear to be andesine as indicated by the extinction angles in sections normal to the albite twinning plane (maximum angle slightly over 20), but the composition varies; in a few crystals optical tests seemed to indicate a composition closely approaching labradorite.

"Inclusions of small idiomorphic apatite crystals are comparatively rare, but extremely minute, glassy inclusions are frequently observed. The evidence of alteration in the plagioclase feldspars is not marked, but a slight cloudiness partially due to kaolinization, and partly to the glassy inclusions above mentioned, is visible along crystal boundaries and cleavage cracks.

"Orthoclase, one of the last minerals to

The Pyroxenes

"Augite in well defined, colorless crystals, evidently original, is found sparingly, nearly always bearing evidence of alteration. The earliest trace is a slight, cloudy greenish or brownish tint. In an advanced stage of alteration, minute greenish fibrous masses and plates spread through the crystal from the edges and give the appearance of a confused aggregate; finally, uralitic hornblende results with only a trace of the original augite remaining.

"All stages in the alteration of augite can be observed in the sections and render it probable that all the uralitic hornblende resulted from the metamorphism of augite. Possibly the compact green hornblende may be still a step in advance in the alteration, being formed from the fiberous hornblende, but the conditions seem to favor more strongly the theory that this is a primary mineral.

Other Minerals

"Cleavage plates and crystals of biotite, usually much corroded and surrounded by aggregates of fibrous hornblende and magnetite, were observed scattered sparingly through the sections, also minute grains and plates of hematite, the latter probably derived from augite.

"Magnetite is present in the rock as an

velopment of epidote and magnetite, altered the mineralogical character.

"It would appear also, from the conditions observed in the slides, that at an early period in this action a partial corrosion or solution of the silver crystals took place, and later by the deposition of secondary magnetite and its segregation around the metallic silver, further change was prevented, preserving the silver as observed, while the alteration of the ferro-magnesian minerals proceeded."

Geology of the Silver Bearing District

The rock above determined lies on the south slope of the Santa Rita mountains in Arizona. The geological sequence has not been determined by competent authority, but it is quite clear that the mass of the rock lies on the slope of an earlier mass of typical syenite, which carries a large variety of accessory ingredients. This syenite seems to be the earliest rock now exposed in this vicinity, and is, as it now seems, the core of the district. On the other side of the mountain are exposed a variety of breccias, which are of later origin. The augite-diorite here described is itself flanked by effusive andesites and dacites and probably these are subsequent to the diorite, though this has not yet been completely demonstrated.

Syenite Contains No Veins

Tunnel of the Utah Metal Mining Company

Salt Lake Correspondence

The Utah Metal Mining Company, which is driving the 11,000-ft. drain and operating tunnel between the Tooele side of the Oquirrh range and Carr Fork, Bingham district, Utah, has completed all of its preliminary work and is advancing the face of the tunnel 80 to 90 ft. per week. The tunnel has been straightened and enlarged to 8x10 ft. and is in a distance of 3000 ft. A double track, 24-in. gage, with 35-lb. rail, will be laid its entire length. At present a single track and switches are used. The grade is 0.4 per cent. Waste and supplies are hauled by a Baldwin-Westinghouse locomotive in trains of four cars. The cars are side dump and have a capacity of two tons each. An exhaust fan with a capacity of 5300 cu.ft. per min. has been installed.

Power Plant

Power is produced from the company's own water supply. A pipe-line has been laid from springs in Pine flat and Hansen Springs cañon, both branches of Middle cañon, in which the plant is situated, and gives a head of 750 ft. at the powerhouse. A 125-h.p. Pelton wheel is direct connected to a Westinghouse 55-kw. direct-current generator and further to build an electric road from the tunnel to the smeltery, six miles. This will have a down grade of about 3 per cent.

Leasers are working on the Bingham side and shipping both silver-lead and copper ore. Some of the old upper workings where this ore is being mined are 2000 ft. higher than the new tunnel. The company has built a living house accommodating 40 men, with a library, bath rooms, etc. At present, 50 men are employed.

Recent Tariff Decisions

Two decisions of some importance have been filed by the Board of General Appraisers on duties levied by the new tariff on articles in which the metal industries are interested:

The board has sustained protests filed by the Goldschmidt Thermit Company, Moses Norris and others, regarding the classification under the tariff of metallic chromium, manganese, tungsten, etc. General Appraiser Fischer, who writes the decision, says that these substances differ from the ferroalloys passed upon in an earlier decision of the board in that they have a much smaller percentage of iron in their composition, although in other respects they are identical in character and are used similarly in the manufacture of special steel or alloy steels. The metals in question are com-

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

MOUNT WRIGHTSON QUADRANGLE
ARIZONA
15 MINUTE SERIES (TOPOGRAPHIC)

(TWIN BUTTES) 3747 I

(EMPIRE MTS) 3847 I

Mapped, edited, and published by the Geological Survey

Control by USGS and USC&GS

Topography from aerial photographs by photogrammetric methods
Aerial photographs taken 1955. Field check 1958

Polyconic projection. 1927 North American datum
10,000-foot grid based on Arizona coordinate system, central zone
1000-meter Universal Transverse Mercator grid ticks,
zone 12, shown in blue

Dashed land lines indicate approximate locations
Land lines unsurveyed in T. 20 S.–R. 15 E., and parts of
T. 20 S.–R. 16 E., T. 21 S.– Rs. 13, and 15 E.,
and T. 22 S.–Rs. 13, 14, and 15 E.

Unchecked elevations are shown in brown

UTM GRID AND 1958 MAGNETIC NORTH
DECLINATION AT CENTER OF SHEET

SCALE 1:62500

CONTOUR INTERVAL 80 FEET
NATIONAL GEODETIC VERTICAL DATUM OF 1929

THIS MAP COMPLIES WITH NATIONAL MAP ACCURACY STANDARDS
FOR SALE BY U.S. GEOLOGICAL SURVEY, DENVER, COLORADO 80225, OR RESTON, VIRGINIA 22092
A FOLDER DESCRIBING TOPOGRAPHIC MAPS AND SYMBOLS IS AVAILABLE ON REQUEST

QUADRANGLE LOCATION

ROAD CLASSIFICATION
Heavy-duty
Medium-duty
Light-duty
Unimproved dirt
State Route

MOUNT WRIGHTSON, ARIZ.
N3130—W11045/15

1958

AMS 3847 III—SERIES V798

(RUBY) 3746 I

(SAHUARITA) 3847 IV

(NOGALES) 3846 IV

(TUBAC) 3747 II

(ELGIN) 3847 II

(LOCHIEL) 3846 I

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

ARIZONA
PATAGONIA QUADRANGLE

(San Xavier Mission 1/62500)
(Happy Valley 1/62500)
32°00′ 111°00′ R.13 E.
R.14 E.
50′
R.15 E.
(Tucson)
R.16 E.
40′
R.17 E.
R.18 E. 110°30′ 32°00′
T.16 S.
T.17 S.
T.18 S.
T.19 S.
T.20 S.
T.21 S.
T.22 S.
Pantano
SOUTHERN PACIFIC
Mescal Arroyo
Hopleys Ranch
O'Learys Ranch
Kadmon
Wakefield Can
Well
Alfredo's Ranch
Bagá Ranch
Browns Ranch
SANTA CRUZ RIVER
(Twin Buttes 1/62500)
CANOA
SANTA RITA EXPERIMENTAL RANGE
Huerfano Butte
Helvetia
Stone's Ranch
Sycamore Canyon
Mt Fagan
Mulberry Can
HELENA MINE
CUPRITE MINE
Andrade's Ranch
Bobo Spr
Mescal Spr
CALIFORNIA MINE
FLYING W RANCH
Davidson Canyon
EMPIRE MOUNTAINS
TOTAL WRECK MINE
Hilton's Ranch
Barrel Spr
Lopez's Ranch
Scholefield's Ranch
Chapo Ranch
McCleary Canyon
Wasp Can
Martinez Ranch
Rosemont
Barrel Canyon
V.R. Ranch
Sandford Ranch
Cienega Creek
PUMP
Proctor's Ranch
Box Canyon
Youngs Ranch
California Gl
Empire Gulch
Empire Ranch
Gardner Canyon
Cottonwood Ranch
Sawmill Canyon
Martinez Ranch
McClearys Ranch
Picketts Ranch
Enzenberg Canyon
Enzenbergs Ranch
Melendreth Pass
Greaterville
Stone Cabin Canyon
Fish Canyon
Praesidio's Ranch
Madera Canyon
White House
Fish Ranch
Kane Ranch
PIMA CO.
SANTA CRUZ CO.
BOUNDARY LINE
(Benson)
Pete Mtn
Sawmill Canyon
Apache Spring
Gardner's Ranch
Gardner Canyon
Stetson's Dam
Youngs Ranch
TREASURE VAULT
Agua Caliente
Mt Wrightson
Mt Hopkins
Josephine Pk
SANTA RITA MOUNTAINS
Smith Canyon
Montosa Mill
Cottonwood Canyon
(NOGALES BRANCH)
Sonoita
Babocomari River
Elgin
Old Ft Crittenden
(Tubac 1/62500)
Canyon
Casa Blanca Canyon
Monkey Canyon
Monkey Spring
Pennsylvania Ranch
BABOCOMARI
Vaughn Canyon
Mt Hughes
CANELO HILLS
CORONADO NATIONAL FOREST
Wise's Ranch
STEAMPUMP
Salero
Josephine Canyon
Corral Canyon
Crittenden
O'Donnell Canyon
Temporal Gulch
Squaw Gulch
Sonoita Creek
Powell's Ranch
McCartys Ranch
Bergier's Ranch
Grosvenor Hills
SAN CAYETANO MTNS
Redrock Canyon
Redrock Ranch
Patagonia
Harshaw Creek
Boyle's Ranch
Turner-Bower Ranch
Clarks Ranch
Jensen Ranch
Ash Canyon
SAN JOSE DE SONOITA
Red Mtn
Alum Canyon
31°30′ 111°00′ R.13 E.
R.14 E.
50′
R.15 E.
(Nogales)
R.16 E.
40′
R.17 E.
R.18 E. 110°30′ 31°30′
(Ruby 1/62500)
(Hereford)

E.M.Douglas, Geographer.
T.M.Bannon, Topographer in charge.
Topography by R.T.Evans, J.E.Blackburn, Chester Irvine, and H.H.Hodgeson.
Triangulation by T.M.Bannon.
Surveyed in 1903-1904.

TRUE NORTH — MAGNETIC NORTH 13°
APPROXIMATE MEAN DECLINATION, 1904

Scale 1/125000

1 ½ 0 1 2 3 4 5 6 7 8 9 Miles

3000 1500 0 3000 6000 9000 12000 Yards

5000 0 5000 10000 15000 20000 25000 Feet

1 0 1 2 3 4 5 6 Kilometers

Contour interval 100 feet.
Datum is mean sea level
Readjustment indicates that elevations on this map should be increased 13 feet

Edition of 1905. reprinted 1946.
Polyconic projection.

ARIZ.
PATAGONIA
N3130-W11030/30

1 Bond
2 Arizona Pittsburg
3 Wandering Jew – 3A ¼ mi. N - Wandering Jew acc/to 15' 1958 Quad
4 Jersey Girl (Shaft)

THE TOPOGRAPHIC MAPS OF THE UNITED STATES

The United States Geological Survey is making a series of standard topographic maps to cover the United States. This work has been in progress since 1882, and the published maps cover more than 47 percent of the country, exclusive of outlying possessions.

The maps are published on sheets that measure about 16½ by 20 inches. Under the general plan adopted the country is divided into quadrangles bounded by parallels of latitude and meridians of longitude. These quadrangles are mapped on different scales, the scale selected for each map being that which is best adapted to general use in the development of the country, and consequently, though the standard maps are of nearly uniform size, the areas that they represent are of different sizes. On the lower margin of each map are printed graphic scales showing distances in feet, meters, miles, and kilometers. In addition, the scale of the map is shown by a fraction expressing a fixed ratio between linear measurements on the map and corresponding distances on the ground. For example, the scale $\frac{1}{62,500}$ means that 1 unit on the map (such as 1 inch, 1 foot, or 1 meter) represents 62,500 of the same units on the earth's surface.

Although some areas are surveyed and some maps are compiled and published on special scales for special purposes, the standard topographic surveys and the resulting maps have for many years been of three types, differentiated as follows:

1. Surveys of areas in which there are problems of great public importance—relating, for example, to mineral development, irrigation, or reclamation of swamp areas—are made with sufficient detail to be used in the publication of maps on a scale of $\frac{1}{31,680}$ (1 inch = one-half mile) or $\frac{1}{24,000}$ (1 inch = 2,000 feet), with a contour interval of 1 to 100 feet, according to the relief of the particular area mapped.

2. Surveys of areas in which there are problems of average public importance, such as most of the basin of the Mississippi and its tributaries, are made with sufficient detail to be used in the publication of maps on a scale of $\frac{1}{62,500}$ (1 inch = nearly 1 mile), with a contour interval of 10 to 100 feet.

3. Surveys of areas in which the problems are of minor public importance, such as much of the mountain or desert region of Arizona or New Mexico, and the high mountain area of the northwest, are made with sufficient detail to be used in the publication of maps on a scale of $\frac{1}{125,000}$ (1 inch = nearly 2 miles) or $\frac{1}{250,000}$ (1 inch = nearly 4 miles), with a contour interval of 20 to 250 feet.

The aerial camera is now being used in mapping. From the information recorded on the photographs, planimetric maps, which show only drainage and culture, have been made for some areas in the United States. By the use of stereoscopic plotting apparatus, aerial photographs are utilized also in the making of the regular topographic maps, which show relief as well as drainage and culture.

A topographic survey of Alaska has been in progress since 1898, and nearly 44 percent of its area has now been mapped. About 15 percent of the Territory has been covered by maps on a scale of $\frac{1}{500,000}$ (1 inch = nearly 8 miles). For most of the remainder of the area surveyed the maps published are on a scale of $\frac{1}{250,000}$ (1 inch = nearly 4 miles). For some areas of particular economic importance, covering about 4,300 square miles, the maps published are on a scale of $\frac{1}{62,500}$ (1 inch = nearly 1 mile) or larger. In addition to the area covered by topographic maps, about 11,300 square miles of southeastern Alaska has been covered by planimetric maps on scales of $\frac{1}{125,000}$ and $\frac{1}{250,000}$.

The Hawaiian Islands have been surveyed, and the resulting maps are published on a scale of $\frac{1}{62,500}$.

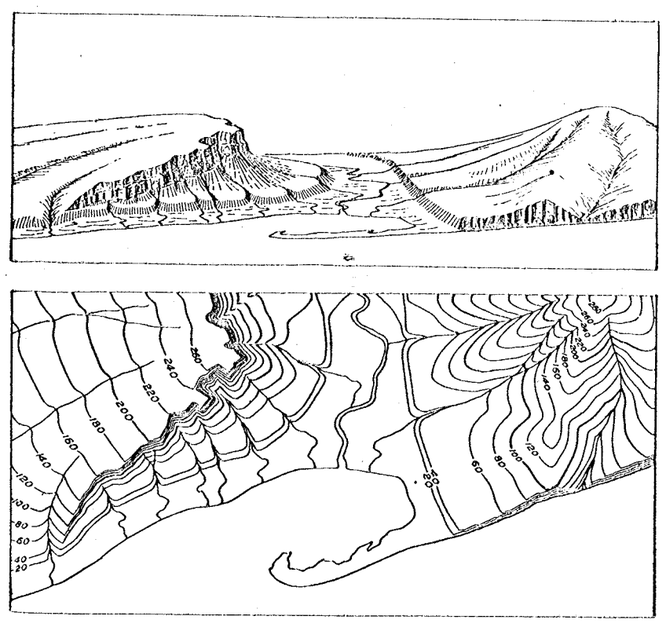
A survey of Puerto Rico is now in progress. The scale of the published maps is $\frac{1}{30,000}$.

The features shown on topographic maps may be arranged in three groups—(1) water, including seas, lakes, rivers, canals, swamps, and other bodies of water; (2) relief, including mountains, hills, valleys, and other features of the land surface; (3) culture (works of man), such as towns, cities, roads, railroads, and boundaries. The symbols used to represent these features are shown and explained below. Variations appear on some earlier maps, and additional features are represented on some special maps.

All the water features are represented in blue, the smaller streams and canals by single blue lines and the larger streams by double lines. The larger streams, lakes, and the sea are accentuated by blue water lining or blue tint. Intermittent streams—those whose beds are dry for a large part of the year—are shown by lines of blue dots and dashes.

Relief is shown by contour lines in brown, which on a few maps are supplemented by shading showing the effect of light thrown from the northwest across the area represented, for the purpose of giving the appearance of relief and thus aiding in the interpretation of the contour lines. A contour line represents an imaginary line on the ground (a contour) every part of which is at the same altitude above sea level. Such a line could be drawn at any altitude, but in practice only the contours at certain regular intervals of altitude are shown. The datum or zero of altitude of the Geological Survey maps is mean sea level. The 20-foot contour would be the shore line if the sea should rise 20 feet above mean sea level. Contour lines show the shape of the hills, mountains, and valleys, as well as their altitude. Successive contour lines that are far apart on the map indicate a gentle slope, lines that are close together indicate a steep slope, and lines that run together indicate a cliff.

The manner in which contour lines express altitude, form, and grade is shown in the figure below.



The sketch represents a river valley that lies between two hills. In the foreground is the sea, with a bay that is partly enclosed by a hooked sand bar. On each side of the valley is a terrace into which small streams have cut narrow gullies. The hill on the right has a rounded summit and gently sloping spurs separated by ravines. The spurs are truncated at their lower ends by a sea cliff. The hill at the left terminates abruptly at the valley in a steep scarp, from which it slopes gradually away and forms an inclined tableland that is traversed by a few shallow gullies. On the map each of these features is represented, directly beneath its position in the sketch, by contour lines.

The contour interval, or the vertical distance in feet between one contour and the next, is stated at the bottom of each map. This interval differs according to the topography of the area mapped: in a flat country it may be as small as 1 foot; in a mountainous region it may be as great as 250 feet. In order that the contours may be read more easily certain contour lines, every fourth or fifth, are made heavier than the others and are accompanied by figures showing altitude. The heights of many points—such as road intersections, summits, surfaces of lakes, and benchmarks—are also given on the map in figures, which show altitudes to the nearest foot only. More precise figures for the altitudes of benchmarks are given in the Geological Survey's bulletins on spirit leveling. The geodetic coordinates of triangulation and transit-traverse stations are also published in bulletins.

Lettering and the works of man are shown in black. Boundaries, such as those of a State, county, city, land grant, township, or reservation, are shown by continuous or broken lines of different kinds and weights. Public roads suitable for motor travel the greater part of the year are shown by solid double lines; poor public roads and private roads by dashed double lines; trails by dashed single lines. Additional public road classification if available is shown by red overprint.

Each quadrangle is designated by the name of a city, town, or prominent natural feature within it, and on the margins of the map are printed the names of adjoining quadrangles of which maps have been published. More than 4,100 quadrangles in the United States have been surveyed, and maps of them similar to the one on the other side of this sheet have been published.

Geologic maps of some of the areas shown on the topographic maps have been published in the form of folios. Each folio includes maps showing the topography, geology, underground structure, and mineral deposits of the area mapped, and several pages of descriptive text. The text explains the maps and describes the topographic and geologic features of the country and its mineral products. Two hundred twenty-five folios have been published.

Index maps of each State and of Alaska and Hawaii showing the areas covered by topographic maps and geologic folios published by the United States Geological Survey may be obtained free. Copies of the standard topographic maps may be obtained for 10 cents each; some special maps are sold at different prices. A discount of 40 percent is allowed on an order amounting to $5 or more at the retail price. The discount is allowed on an order for maps alone, either of one kind or in any assortment, or for maps together with geologic folios. The geologic folios are sold for 25 cents or more each, the price depending on the size of the folio. A circular describing the folios will be sent on request.

Applications for maps or folios should be accompanied by cash, draft, or money order (not postage stamps) and should be addressed to

THE DIRECTOR,
United States Geological Survey,
Washington, D. C.

November 1937.

STANDARD SYMBOLS

CULTURE
(printed in black)

City or village
Roads and buildings
Ruins
Cliff dwelling
Good Public road
Poor Public or private road
Trail
Railroads
Electric railroad
Tunnel
Power-transmission line
Wharves
Breakwater and jetties
Bridge
Drawbridges
Ferry *(point upstream)*
Ford
Dam
Dam with lock
Canal lock *(point upstream)*
U.S. township and section lines and recovered corners
State line
County line
Civil Township or district line
Reservation line
Land grant line
City, village, or borough line
Small park or cemetery line
Triangulation point or transit traverse station
U.S. mineral monument
Boundary monument
Bench mark *(supplementary bench mark shown by cross and black figures without lettering)*
BM ×1232
Cemeteries
CEM
Church, School *(distinguished on recent maps)*
Coke ovens
Tanks and oil reservoirs
Oil and gas wells
Mine or quarry
Prospect
Shaft
Mine tunnel
Mine tunnel *(showing direction)*
Lighthouse or beacon
Coast Guard station
• L.S.S.
• C.G.S.

RELIEF
(printed in brown)

5463
Elevation above mean sea level *(in black on recent maps)*
Contours *(Contours showing depth of water printed in blue)*
Depression contours
Levee
Wash
Cliffs *(or shown by contours)*
Mine dumps
Tailings or mining debris
Sand and sand dunes

WATER
(printed in blue)

Streams
Falls and rapids
Intermittent streams and ditches
Canals or ditches
Aqueducts or waterpipes
Aqueduct tunnels
Lake or pond
Unsurveyed stream and abandoned canal
Intermittent lake
Glacier *(Or shown by contours printed in blue)*
Spring Well
Marsh
Submerged marsh

WOODS
(when shown, printed in green)