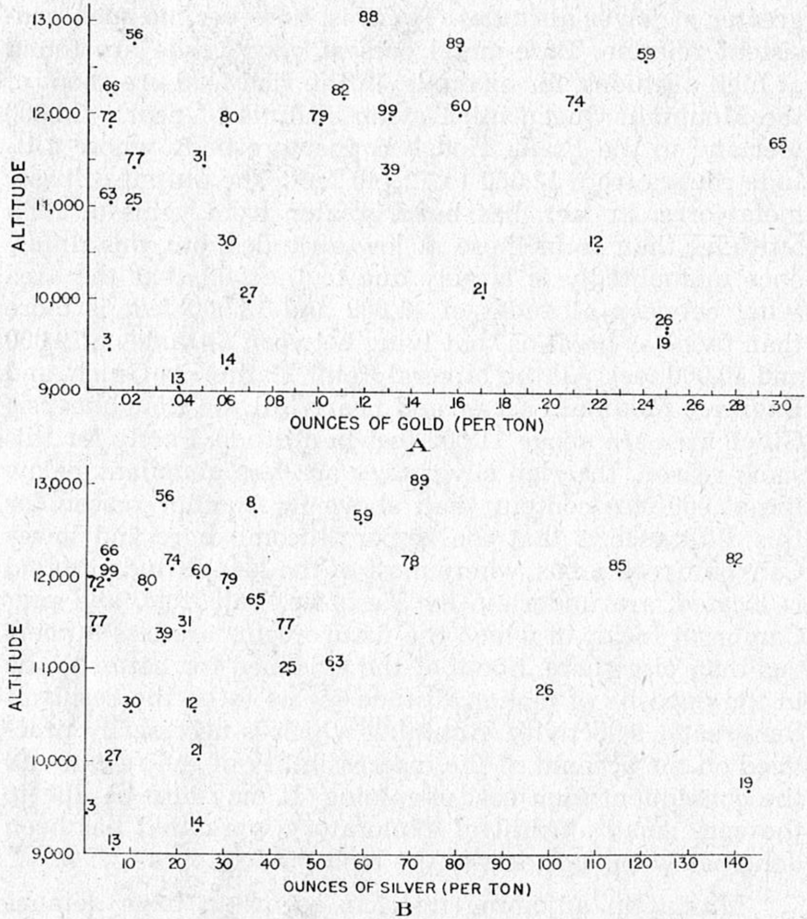

Figure 4. Relationship between average precious-metal content of ores shipped or milled and altitudes of ore shoots: (a) gold content, (b) silver content. Numbered points correspond to numbered mine locations shown in fig. 5.

vicinity of the Adams lode it is found at an altitude about 11,500 feet.

The decrease in silver content of certain ore shoots with depth has given rise to the idea that the rich silver ores are shallow and, therefore, that the base-metal content may be greater at lower altitudes. There is, however, no such consistent relation. Base-metal ores of good grade are found at high altitudes, for example, in the rich lead-ore shoot of the Mountain Queen mine at an altitude of nearly 12,800 feet and in the Frank Hough copper ore body whose altitude ranges from 12,500 to 12,740 feet. The output of base-metal ores, in fact, has been greater from veins at high altitudes than from those at low altitudes, but this difference undoubtedly is largely due to the fact that the area lying between altitudes of 11,000 and 13,000 feet is more than twice as great as that lying between altitudes of 9,000 and 10,000 feet. All the Mineral Point, California Gulch, and Engineer Mountain areas, and nearly all the Poughkeepsie Gulch area are above 11,000 feet in altitude. Partly for this same reason, the rich silver ores are less abundant below the 11,000-foot contour than above it. Another reason for this difference is that the Upper Uncompahgre and lower Canyon Creek areas, where most of the low-altitude ground is located, are underlain by Mesozoic, Paleozoic, and pre-Cambrian rocks, in which the fissure veins are less numerous than elsewhere. Some of the evidence for better grade in the deposits of higher altitude seems to be the result of the greater selectivity in mining which is necessarily practiced on the account of the inaccessibility of the region and the consequent high cost of mining. It may also be due to the very small amount of exploratory work that has been done below the bottoms of the high-grade stopes.

Mining in adjoining districts seems to have demonstrated that silver ores are commonly richer in the shallower parts of the veins or in those parts that were closest to the surface when ore deposition took place. Although the relative position of this original surface and the irregularities and relief that is possessed are quite speculative, it is, nevertheless, of considerable significance with regard to both hypogene and supergene deposition to establish it at least generally. The restoration of the surface that existed at the time of vein deposition requires not only a knowledge of the age of the mineralization but also the former extent and thickness of the younger volcanic units that have been eroded from the region. The youngest pre-mineral extrusive rocks within the region under consideration are the lower members of the Potosi volcanic series of Miocene age. Twelve miles to the east upper members of this series are overlain by the Fisher latite-andesite, which is also thought to be of Miocene but may be of the Pliocene age. The pre-mineral intrusive rocks of the region were intruded at different times, but some of them cut the local lower Potosi rocks; they may therefore be equivalent to the upper Potosi flows, or to the Fisher latite-andesite, or they may have been intruded still later, in Pliocene time. Hypogene ore deposition is believed to have taken place at the close of volcanic activity, either in late Miocene or more likely in early Pliocene time.

Although the Potosi volcanic series locally attained thicknesses of several thousand feet far to the east, it is very doubtful whether its upper members extended as far west as Engineer Mountain, where only a part of the lowest member remains today. That an appreciable thickness did cover the region as late as early Pleistocene time is proved by the dominance of Potosi boulders in the moraines of early (Cerro) glaciers that eroded the San Juan Mountains before the present deep canyons were formed. It is doubtful whether any appreciable thickness of the Fisher latite-andesite ever extended as far west as Engineer Mountain. Because of this vagueness of evidence, the thickness of Potosi and any later rocks that covered the region at the time of mineral deposition can only be guessed, but it is not believed to have been much if any more than 2,000 feet. Such a thickness if restored would bring the surface of the region to an altitude of about 15,000 feet. The highest ore bodies now existing in the region would therefore have formed at a depth of 2,500 feet or less and the lowest about 5,800 feet below this surface. The following table shows the approximate depth of deposition and vertical range of altitude of several prominent ore shoots.

VERTICAL RANGE OF HIGH-GRADE ORE SHOOTS

Mine	*Altitude of ore shoots (feet)*	*Average depth of deposition below the original surface (feet)*
Polar Star	12,800-13,100	2,500
Ben Butler	12,100-12,200	3,000
Old Lout	11,000-11,500	3,500
Guadaloupe	11,000-11,100	4,000
Mickey Breen	9,700-10,600	4,500
Dunmore	9,100- 9,300	5,800

As erosion was in progress at the time of ore deposition and as displacement along faults before and during ore deposition tended to accentuate relief, it may be that the highest ore bodies were formed at depths of no more than 2,000 feet. Many of the ore shoots thus far mined were bottomed or became of lower grade within a short vertical distance. Others were too costly to mine for more than a few tens or hundreds of feet in depth. Of the shoots mined to date, however, those that remain unbottomed are more numerous than those that have been bottomed. Individual ore shoots probably have a large range in both horizontal and vertical dimensions. Some may extend for only a few tens of feet below the present surface; others may not extend far vertically but may pitch at low angles for rather long distances; and others still may have deep continuous roots extending into the pre-Cambrian basement.

Since the aggregate vertical range of ore shoots already worked is over 4,000 feet, it is reasonable to wonder whether ore shoots similar to the Old Lout and Mickey Breen, which were mined at relatively moderate to low altitudes, may not be waiting discovery at equally low altitudes beneath such high-altitude shoots as the Polar Star or Mountain Queen.

It is quite possible that exposed shoots, and high-altitude shoots especially, are guides or clues to underlying shoots even though not continuous or directly connected. A succession of shoots along one course of circulation seems to have been formed in certain other districts and a similar succession in these districts is worthy of consideration.

Most of the ore shoots end, or perhaps more appropriately are interrupted, in depth just as they do along the strike, some of them abruptly. As the horizontal distance between shoots may be tens or hundreds of feet, it could be argued that similar barren or low-grade vertical intervals are to be expected. Both the horizontal and vertical distributions of primary ore shoots, however, depend upon the courses followed by ore-forming solutions. These solutions, starting from a deep source and following the more open parts of fissures, maintained a general upward course but were locally deflected toward a horizontal course, and here and there may even have turned to a downward course for appreciable distances.

The suggestion of chainlike successions of ore shoots one above or beyond the other does not imply that an ore shoot found by deeper exploration will be of the same grade or metal content as one at higher levels in the same vein; on the contrary, changes in metal content with depth are as irregular as horizontal changes along the same vein from one mine to another. The Guadaloupe ores, for example, were chiefly of copper on the York level (alt. 10,983 feet) but on the Lucky Twenty level (alt. 10,315 feet) were of lead and zinc. Although it is still somewhat early for an appraisal, it appears that the Black Bear vein contains relatively more copper on the Treasury Tunnel level than in the blocked-out ores of the upper levels. The change in the tenor of ores is probably no more regular vertically than horizontally.

It is obvious from the foregoing consideration that the bottoming of a high-grade ore shoot is not proof that all the productive ground in the vein has been exhausted. The interruptions or discontinuities in ore shoots in depth, as along the strike, are largely due to structural factors. Further prospecting, whether along the strike, pitch, or dip of the vein should be based on a close study of the details of fracturing and mineral composition of the vein material. It is to be expected that the number of favorable openings decreases with depth, as the increasingly greater pressure tends to prevent them from forming or to close them soon after they have been formed. It is also theoretically true that the low-temperature silver minerals are to be expected in greatest quantity at shallow levels, but the differences in wall-rock temperatures to depths as great as that of the local pre-Cambrian basement surface are doubtless so small as to have little influence in determining the level at which ore-forming solutions would become sufficiently saturated by cooling to deposit the minerals. In short the downward limit of mining is most likely to be determined by the scarcity of favorable structural features and the cost of exploration.

The distribution and grade of ore shoots may be more closely related to the different structural features as described under "Formation of primary ore shoots" than to depth or to distance from volcanic centers. Probably the most important over-all structural feature is the fact, pointed out on page 307, that most of the numerous veins in volcanic rocks of the Upper Uncompahgre district bottom at or slightly above the pre-Cambrian basement. A similar condition may be expected in the Mineral Point and adjoining districts. A greater proportion of the veins in these districts, however, may continue into the basement because displacements along them are greater and they are closer to eruptive centers where more continuous fissuring in depth would be expected. The surface of the pre-Cambrian basement beneath Mineral Point and Poughkeepsie Gulch probably lies near an altitude of 10,000 feet; much material therefore remains unexplored even above that altitude, and it is reasonable to conclude that deeper prospecting of veins with due regard to surface ore shoots and local factors of structural control is justified.

Indications of Supergene Deposition

The quantity of oxidized ore in the form of such minerals as cerussite, anglesite, cerargyrite, malachite, and smithsonite is small, and significant occurrences are restricted to positions very near the present surface, mostly along high ridges and valley sides. The quantity of native silver or secondary sulfides in the form of argentite, chalcocite, and proustite is even much less. Cerargyrite or "horn silver," an undoubted supergene mineral, is unreported in these and immediately adjoining districts, a fact noted by Bastin[28] who, however, suggested the absence could possibly be attributed to low chlorine content of most of the surface waters. The manganese minerals, rhodochrosite and rhodonite, are common in many veins, and their oxidation could start a process favorable to supergene concentration of gold[29]. The high gold content (from several tenths of an ounce to several ounces to the ton) in some of the high-altitude mines of the districts has suggested enrichment to some observers.

During most of late glacial and post-glacial time conditions for complete oxidation, solution, and supergene enrichment have been unfavorable. On the other hand, the great relief, open channels, and vigorous ground-water circulation have made possible local partial oxidation and supergene deposition to great depths. Local oxidation of pyrite to limonite is present in the Black Bear vein on the Treasury Tunnel level, and similar effects were noted commonly in the veins cut by the Frisco tunnel. Bastin[30] cited examples of spotty oxidation to depths of 2,400 feet in the

[28]Op. cit., p. 97.

[29]Emmons, W. H., The agency of manganese in the superficial alteration and secondary enrichment of gold deposits in the United States: Am. Inst. Min. Eng. Trans., vol. 42, pp. 25-49, 1912.

Emmons, W. H., The enrichment of ore deposits: U. S. Geol. Survey Bull. 625, pp. 305-316, 1917.

[30]Op. cit., p. 95.

Smuggler-Union and Liberty Bell mines, and noted secondary silver minerals as follows:

"In the Virginius vein at a depth of about 2,100 feet thin films of proustite occurred along sharp fractures in primary ore, and from these fractures the proustite could be cleanly stripped. Similar occurrences of proustite were noted in the Terrible No. 3 vein in the Mountain Top tunnel at a depth of about 400 feet. In both localities the proustite was present in very meager amounts. In primary ore from depths of about 1,700 feet in the Smuggler-Union mine argentite and native silver were noted on the quartz of vugs and in clean-cut fractures. Both of these minerals are secondary, and the silver is the younger, being clearly an alteration product of the argentite. In the Waters vein of the Liberty Bell mine at depths of 1,000 to 1,400 feet secondary argentite has replaced galena, and between the two occurs an intermediate replacement product probably a sulphide of lead and silver."

Small veinlets of secondary chalcocite and native silver replacing chalcopyrite were described by Bastin from a depth of 650 feet in the Wedge mine.

At the Lost Day mine at an altitude of 11,700 feet on the west side of Brown Mountain masses of cerussite were mined from landslide that is probably post-Durango and pre-Wisconsin in age. Although the cerussite was the principal ore mineral mined in the open cuts, remnants of galena were found 15 to 20 feet below the surface. Considerable dense gray anglesite has been found recently along the 1,700-foot level in the Shenandoah-Dives vein at depths of only a few tens of feet beneath the surface.

In the Engineer Mountain area ores in the Engineer and Wyoming mines, which are located in the high divide, contained secondary sulfur termed "black sulfurettes," small shipments of which are said to have contained 1.5 to 2.5 ounces of gold and 180 to 250 ounces of silver to the ton. In the Engineer mine the "black sulfurettes" formed coatings on and filled cracks in ore that had been honeycombed by the leaching of sphalerite. In the Wyoming mine a narrow streak of gray porous quartz contained wire silver, which like the "black sulfurettes" is generally formed at or just below the base of the oxidized zone.

The Frank Hough mine, which is located near the head of the glaciated valley at the north slope of Engineer Mountain, was reported by Ransome,[31] on the basis of specimens collected on the dump in 1899, to consist chiefly of chalco-

[31] Ransome, F. L., Economic geology of the Silverton quadrangle, Colo.: U. S. Geol. Survey Bull. 182, pp. 189-190, 1901.

cite, most of it closely intergrown with quartz and associated with a little chalcopyrite and tetrahedrite. Although considerable mining had been done in the interim, my examination of the dump in 1942, as well as microscopic study of polished ore specimens, failed to detect any chalcocite. The specimens were of typical primary ore containing tetrahedrite and hessite which may have been sufficiently abundant in the ore mined in the early days to account for the high silver content. It is likely but not certain that the chalcocite noted by Ransome was supergene. In keeping with this evidence and the "black sulfurettes" and native silver in the Wyoming mine, it is possible that argentite and perhaps proustite in the Polar Star and neighboring mines were supergene; they could equally well, however, be products of hypogene concentration controlled in their position by structure, pressure, and temperature.

The description of the physiographic history of the San Juan Mountains by Atwood and Mather[32] in which they recognized several past periods of erosion in the region raises the question whether older oxidized and enriched ore shoots might not have formed with reference to the ancient surfaces. Although the vigorous erosion that formed the present rugged mountains and deep canyons obliterated most of these old surfaces and associated supergene ore shoots, there is still the possibility that remnants may be partly preserved along some of the remote protected divides. According to Atwood and Mather there have been two long periods of weathering and one period of much shorter duration, though still long enough to permit deep weathering in places.

They concluded that the first period was sufficient for the former mountains, developed in late Tertiary or Pliocene time, to be worn down to a surface of low relief, named the San Juan peneplain. As the ore deposits also are believed to have formed in Pliocene time, it is doubtful

[32]Atwood, W. W., and Mather, K. F., Physiography and Quaternary geology of the San Juan Mountains, Colo.: U. S. Geol. Survey Prof. Paper 166, pp. 1-167, 1932.

whether this very old erosion surface was formed late enough to have permitted any weathering of the deposits. This surface was in part covered by post-mineral (?) lava flows of the Hinsdale volcanic series, large remnants of which remain 17 miles and more east of Mineral Point, but whether these flows once extended as far west as Mineral Point is not known. Atwood and Mather have suggested that the summit area called American Flats (see pl. 1), in and beyond the northeast corner of the area under consideration, may be a remnant of the San Juan peneplain surface.[33] If so, any rocks of the Hinsdale series that may have covered it and thereby helped to protect the local ore deposits from oxidation were removed during some later cycle of erosion.

Whether American Flats was really a part of the San Juan peneplain is also a question. It is probable that this area was still overlain by a very appreciable thickness of the Potosi volcanic series after the peneplain had been formed, and that these Potosi rocks remained until a late stage of the next, or Florida, erosion cycle. When these rocks were once removed the underlying soft Henson tuff was rapidly eroded, forming the present nearly plain surface floored by pyroxene andesite and lower members of the Silverton volcanic series. If all this erosion took place during later stages of erosion, it seems unlikely that the veins now exposed in the American Flats area could have been near enough to the surface during San Juan peneplain time to have been subjected to any weathering.

During the transition from Pliocene to Pleistocene (early Quaternary) time the San Juan area was uplifted markedly which started a long period of broad valley cutting. This period was interrupted by the first and greatest of three stages of glaciation. Glaciers during the first or Cerro glacial stage covered not only the broad valleys but the intervening areas. Remnants of its moraines are found in the foothills, particularly at Cerro summit and in the

[33]Idem., pp. 42, 86, and pl. 2.

area east of the Uncompahgre River, 1,000 feet above the present valley bottoms.

The Cerro moraines, or till, in this area are composed largely of latite fragments belonging to the Potosi volcanic series,[34] which evidently still covered much of the mountain area as far south as Mineral Point.

The Cerro glacial stage was followed by a long period of weathering and stream erosion, during which the rocks of the Potosi volcanic series were largely removed from the higher mountains, and large quantities of gravel were deposited in the foothill areas and along the larger river valleys. The entire period, from pre-Cerro uplift to and including the deposition of the gravel, is known as the Florida erosion cycle. During the long, later part of this cycle the Cerro moraines became thoroughly weathered and the boulders in them were reduced to the softness of soil. It is noteworthy that Atwood and Mather do not mention the presence of any fragments of vein material in these thoroughly weathered moraines, especially as such durable material as vein quartz would have been conspicuous even though scarce, in contrast to the thoroughly decomposed rock fragments. It seems likely then, that the veins of the Mineral Point and adjoining districts did not become exposed to erosion until the long interval of weathering that followed the Cerro glacial stage.

It appears, therefore, that such surfaces as American Flats and Mineral Point are the result of late Florida and later erosion. Their general level and development as flat surfaces may have been the result of the broad valley erosion of the Florida cycle, but they doubtless have been somewhat lowered and modified by subsequent glaciation and canyon cutting. The lowering of the Florida surface probably did not exceed a few hundred feet except in the late canyons.

The Florida erosion cycle was closed by another uplift which started a cycle of canyon cutting. During this cycle

[34]Idem., pp. 102, 107.

the Florida surface was widely destroyed, and all but the lower parts of the present canyons were cut before stream erosion was interrupted by the Durango stage of glaciation. During this stage the products of weathering in the districts under consideration were largely removed. This stage was followed by another interval of weathering which, although not so long as that following Cerro glaciation, was sufficient for the Durango till, notably in the vicinity of Lake City, to become deeply weathered and extensively eroded.[35] During this post-Durango interval the Uncompahgre River deepened its valley more than 400 feet in the vicinity of Ridgeway. South of Ouray the deepening must also have been very appreciable, though the deeper canyon walls are so thoroughly merged with those cut in pre-Durango time that no separation of the two intervals has been recognized. This deepening and the consequent lowering of ground-water level afforded further opportunity for the oxidation and enrichment of ore in the Mineral Point and Engineer Mountain area, which was beyond the reach of canyon cutting, but this opportunity was probably lessened to some degree by the cold climate that prevailed in these high areas.

This appreciable though relatively short interval was followed by still another uplift and by the third or Wisconsin stage of glaciation, during which any newly accumulated oxidized material was largely removed. Since Wisconsin time some additional canyon cutting has taken place. Local gorgelike deepening along the Uncompahgre River near the Connie mine is nearly 200 feet, and in Canyon Creek above Box Canyon it is somewhat more.

The conditions and opportunities for oxidation and sulfide enrichment of ore deposits were probably but little better during the interval between Durango and Wisconsin time than the recent and present time. Therefore, the most effective period for supergene deposition was during late

[35] Atwood, A. A., and Mather, K. F., op. cit., p. 127.

Florida time, but the only remnants of the Florida erosion surface in the region have been so effectively scoured by the Durango and Wisconsin glaciers that little evidence of oxidation remains on them. Only at the summit of Engineer Mountain and in the high spurs extending northward and eastward from it would there be much likelihood of finding any remnants of oxidized ore; it is there that the "black sulfurettes" and wire silver in the Wyoming and Engineer mines were found. Even these minerals are indicative of only the bottom of the zone of oxidation, and imply that an indefinite thickness of oxidized mineralized ground must have been removed.

The shallow ores in other nearby mines, like the Polar Star and possibly the Frank Hough, are so close to the oxidized zone that they may have received some enrichment during Florida time, as suggested by the presence of argentite and proustite; but, as already stated, the mere presence of these minerals is not proof of enrichment.

The same possibility exists for the Old Lout mine near the west edge of the Mineral Point surface, the Alaska mine high in Poughkeepsie Gulch, the upper workings of the Silver Link mine, and the Royal Consort vein at the Mickey Breen mine where in each place high values of silver and gold were contained in ores that were probably not far below the old Florida surface. At the Alaska mine the high silver content is known definitely to be associated with the hypogene mineral alaskaite. Similarly the Old Lout ores have been described as containing bismuthites. At the Silver Link mine the best ore was in solid quartz, suggestive of a hypogene occurrence, and it seems likely that argentiferous sulfosalts may have been responsible for the high silver values in the Royal Consort as well as the Silver Link. The richest ores at the Wewissa mine (alt. 11,688 feet) contained pure sulfide intergrowths of tetrahedrite, galena, and chalcopyrite. The best ore in the upper workings of the Mickey Breen vein and in the Mother Cline appear to be too far below the old Florida surface to have received enrichment.

Summing up the foregoing discussion, the very shallow ores protected from severe glaciation and canyon cutting along the remote Engineer Mountain divide may indicate some enrichment in or just below the oxidized zone related to the Florida surface. Although ores containing argentite and proustite at the Polar Star mine, native silver at the Wyoming mine, and chalcocite at the Frank Hough mine may owe their richness partly to supergene deposition, it seems more than fortuitous that the Wyoming ores consistently contained bismuthites known to be argentiferous and hypogene elsewhere and that hessite occurred in the Frank Hough ores.

A strong contrast to the Mineral Point and adjoining districts is offered by the Creede district, Colorado. There the Amethyst vein, which crops out in an unglaciated area approximating the level of the Florida surface, has been leached to a depth ranging from 150 to 300 feet, below which it has been oxidized and enriched to a maximum depth of about 1,000 feet.[36] Native silver, cerargyrite, and gold are the principal minerals, and partly oxidized sulfides are abundant, especially on the lower levels. No evidence of much sulfide enrichment and none of the complex antimony or arsenic sulfosalts of silver have been found either in the mine or during careful scrutiny of cabinets containing specimens of the richer ores. "Argentite has been noted in the Mollie S ore and is doubtless present also as a secondary mineral in the ore of the Amethyst lode."[37] This general absence of sulfosalts, together with the lack of proof that even argentite is secondary, lends little support to the suggestion that these minerals might be secondary in the Mineral Point and adjoining areas.

It may be concluded that some oxidation and enrichment may be still preserved in the high and remote areas

[36]Emmons, W. H., and Larsen, E. S., Geology and ore deposits of the Creede district, Colo.: U. S. Geol. Survey Bull. 718, p. 127 and fig. 15, 1923.

[37]Idem., p. 129.

such as along the Engineer Mountain divide. Some of this supergene deposition may have formed in recent time, some during the post-Durango interval, and some during the Florida erosion cycle. Although the Florida period was the longest and most favorable in which supergene deposits could form, they have been so completely obliterated or modified subsequently as to leave much uncertainty as to origin. Most of the few deposits that could conceivably owe the high tenor of their ores to supergene deposition have been already rather thoroughly exploited so that their origin is of less practical significance than it was in the beginning.

From the viewpoint of successful mining a decline of silver and gold content in depth because of hypogene zoning is just as serious as a decline at the base of a zone of supergene enrichment. There is much evidence that what greater silver and gold values do occur at high altitudes are the result of an original hypogene zoning, but, as pointed out above, whether this condition actually exists in this area is not fully established by the records of shipments of ore. There is sound geologic evidence that much additional good hypogene ore exists below and beyond deposits already explored. It has been established on the basis of mining and the vertical distribution of deposits that there is a recurrence if not persistence of ore shoots of several varieties in depth through a 4,000-foot range in altitude. The ore shoots are dominantly hypogene, and in the matter of depth or vertical range show little or no relation to the present or past erosion surfaces. A thorough correlation and evaluation of factors that have controlled the distribution of ore shoots and the character and tenor of the ore require still further study. Deeper prospecting with due regard to local channels, centers of mineralization, and structural controls is justified.

MINES AND PROSPECTS

Introduction

Under the description of each mine or prospect is given systematically the location and accessibility, mining developments, geology and mineralogy, and history or record of production. The information as to location and accessibility can be of course precise and complete. The mining developments and improvements at many of the small properties can be obtained by examination, but in the more developed properties the workings are commonly only partly or not at all accessible. Many excellent maps of workings and records of improvements in general were found in the files of the County Surveyor's office at Ouray and much credit is due to J. C. Ingersoll, Richard Whinnerah, Bert Wheeler, F. R. Shaffer, and others who have painstakingly helped in preparing, filing, and indexing the surveys. Maps of workings, sample assays, and output figures of inaccessible as well as accessible mines were obtained from some private reports. Finally, the oral accounts of many who have worked, operated, or owned properties in the district have been incorporated. The locations of mines and prospects are shown in figure 5.

The inaccessibility and poor condition of many workings have made observation of the ores in place very difficult and many of them are incomplete. Many descriptions of extensively worked deposits had to be made solely from examination of the dumps and surface exposures.

The histories and records of output for many of the properties are only very incompletely given. Unfortunately the records are especially incomplete for the years prior to 1900 when most of the output was made. Principal sources are reports of the U. S. Mint, private reports, personal accounts, and Ransome's report.[38] The records and files of Charles W. Henderson, Mineral Production and Economics Division of the U. S. Bureau of Mines at Denver, yielded

[38]Ransome, F. L., A report on the economic geology of the Silverton guadrangle; U. S. Geol. Survey Bull. 182, pp.1-265, 1901.

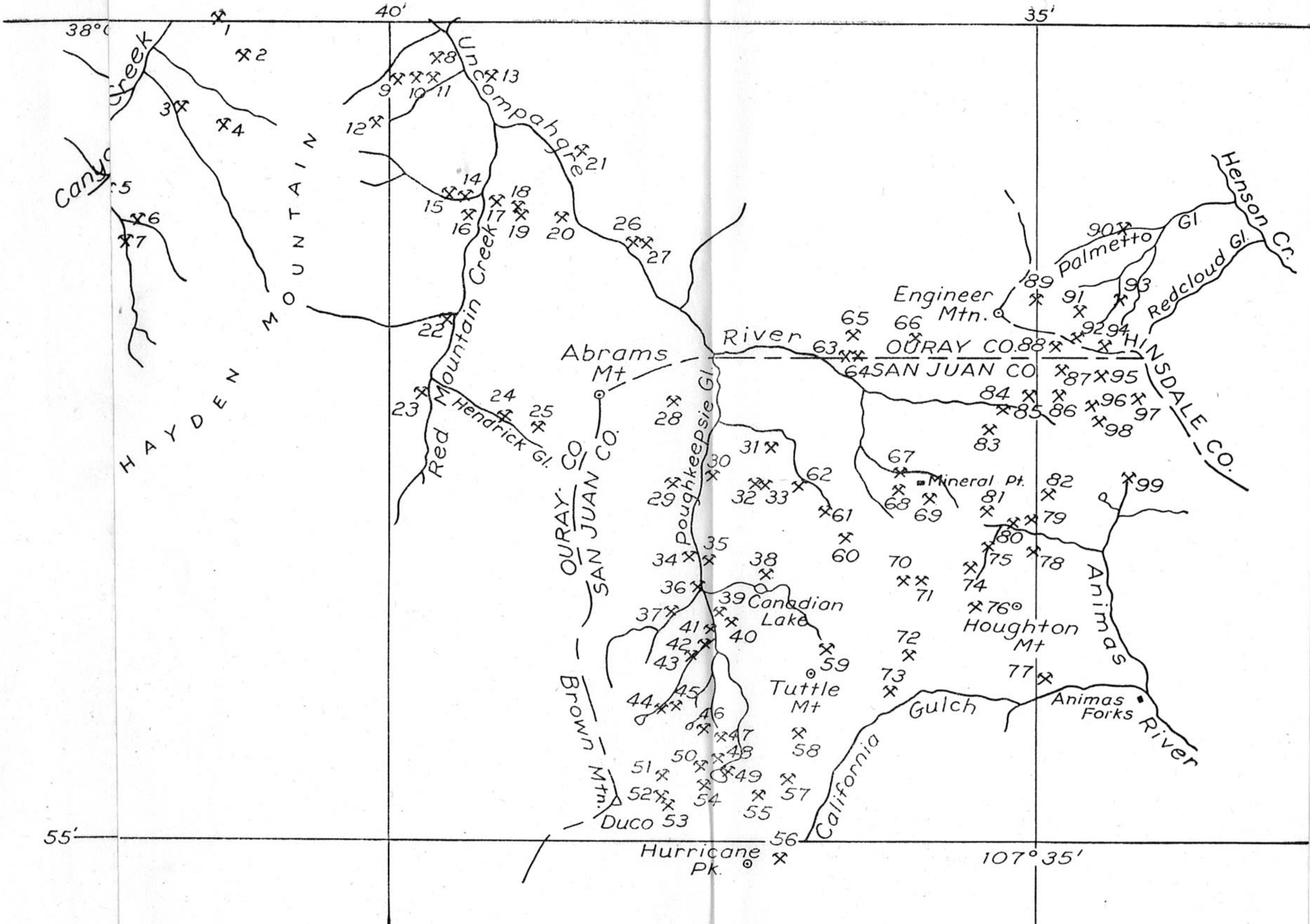

Figure 5. Index map of mines and prospects.

INDEX MAP OF MINES AND PROSPECTS

(c=caved; s=shaft, inaccessible)

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INDEX MAP OF MINES AND PROSPECTS

(c=caved; s=shaft, inaccessible)

Alphabetical List

besides output figures brief accounts of mine developments and district activities.

The descriptions are grouped into arbitrarily defined geographic areas, and the order of treatment within each is according to convenience, proximity, and logical relationship of deposits.

History and Production

The history of mining in these districts is closely related to that of Silverton, Ouray, and Lake City districts. The beginning of prospecting and active mining in the Silverton and central San Juan area is described by Ransome[39] as follows:

"Prior to 1860 the area now included in the Silverton quadrangle had been visited by but few white men, and at a time when every gulch of the Sierra Nevada was a scene of picturesque activity the Indian and the mountain sheep were as yet undisturbed in their possession of the San Juan. But no natural obstacles have ever long withstood the restlessness and indomitable perseverance of the seekers after precious metals. In 1860 (according to some, 1861) a large party of miners, under the leadership of John Baker[40], penetrated to the little mountain-rimmed "park" where the town of Silverton now stands. They had hoped to find profitable gulch mining, but, overtaken by the heavy winter snows and harassed by the Ute Indians, many of the party perished miserably and the remnant escaped over the mountains only after suffering great hardships. For several years the memory of this unfortunate expedition seems to have discouraged further attempts at prospecting in the neighborhood of Bakers Park. It was not until the early seventies that reports of mineral wealth again began to draw the more adventurous miners into the San Juan region. Some gold

[39] Idem, page 19.

[40] Accounts differ as to the Christian name of this pioneer. Thus Bancroft (History of Nevada, Colorado, and Wyoming, San Francisco, 1890, p. 495) refers to him as John Baker; T. A. Rickard, in his paper on the Development of Colorado's Mining Industry (Trans. Am. Inst. Min. Eng., Vol. XXVI, 1896), gives his name as Jim Baker; while Frank Hall, in his History of Colorado makes him Charles Baker.