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CHLORIDE FALL-OUT IN THE GREAT SALT LAKE WATERSHED

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Five collecting stations were established at Elko, Ely, Salt Lake City Municipal Airport (4200 ft.), at my home on the east bench of Salt Lake City (5000 ft), and at Alta (9000 ft.). Samples from all individual rains and snows were collected for one year and analyzed for chloride. A number of snow pack profiles at various places from the Sierra Nevada to the Uinta Mountains, representing the winter's snow accumulation, were also taken. By a comparative study of these data the following conclusions were drawn.

1) Chloride transported by the atmosphere directly from the Pacific Ocean was distinguished from chloride of local derivation from the desert floors and from Great Salt Lake.

2) About 15,000 tons of chloride comes directly from the Pacific each year and falls on the watershed.

3) About 31,000 tons of chloride that falls on the watershed each year is considered to be of local derivation, and is thus part of the recycled salt.

Other elements of the recycling regimen are studied, as well as other possible sources of chloride in Great Salt Lake. It is concluded that atmospheric chloride gained from the Pacific Ocean is clearly the chief primary source.

Among other sources, weathering is studied by means of soil profiles and chloride profiles of the streams, and it is concluded that very little chloride is derived from this source.

RECENT ELEVATION CHANGES IN SAN SIMON VALLEY, ARIZONA

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Repeated first-order leveling in San Simon Valley, Arizona, has revealed measurable changes in elevation for the period 1907-60. Uplift and subsidence have occurred which appear to reflect an interplay of tectonic activity and diminishing artesian pressure.

Areas of subsidence coincide with areas of pronounced artesian head decline. Of areas which have experienced uplift, one is in the center of the valley, and another, between a subsiding area and the bordering mountains. Geophysical data provide an explanation of the cause and localization of uplift.

Both areas of uplift are at considerable distance from the valley margin, but are coincident with gravity and magnetic highs indicative of a shallow basement. Flanking steep gravity gradients suggest high-angle faults. One gradient extends northwest to follow the range front fault bordering the west edge of the valley. Another coincides with a 2-mile-long, open fissure in alluvium.

These observations permit interpretation of the central uplift as a surface manifestation of a rising bedrock horst. Topographic profiles across the rise display local upward convexity suggesting that uplift has continued long enough to affect the gross form of the present topographic surface. Wells penetrating upper Pliocene or Pleistocene lake sediments in the area reveal pronounced thinning over the horst that cannot be explained by differential compaction. Tectonic movement thus appears to have been initiated in, or before, Pleistocene time, and is still continuing today. Local residents report discontinuous, but perennial, low-intensity seismicity.

VARIATION OF MINERALIZATION WITH GEOLOGIC FACTORS IN THE CORTEZ-BUCKHORN AREA, NEVADA

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The mineralogy and geochemistry of metallization in the Cortez-Buckhorn area vary widely and probably reflect a complex interplay of temperature, composition of ore-forming solutions, and influence of host rocks.

The host rocks consist of Paleozoic carbonate rocks in the lower plate of the Roberts Mountains thrust, Paleozoic siliceous rocks in the upper plate, intrusive quartz monzonite of Jurassic age, and basaltic andesite of Pliocene age. Oligocene rhyolitic intrusives are altered and possibly related to metalization. Rhyolite younger than basalitic andesite is probably related to metallization in the andesite.

Ore bodies in lower-plate carbonates at the Cortez silver mine and in Mill Canyon contain pyrite, sphalerite, galena, argentian tetrahedrite, and boulangerite. In addition andorite occurs at the Cortez silver mine and arsenopyrite, chalcopyrite, bournonite, pyargyrite, owyheeite and gold occur at Mill Canyon. Disseminated gold is present in carbonate rocks at the Cortez gold mine; geochemical anomalies in arsenic and mercury also occur.

Mineralized localities in upper-plate siliceous rocks, which generally contain simple sulfides, include Copper Canyon where metal anomalies are dominated by copper, zinc and lead; Horse Canyon which shows geochemical anomalies in mercury, arsenic, and antimony; and Fourmile Canyon where geochemical anomalies in arsenic, tellurium, and molybdenum are present.

Veins in Jurassic quartz monzonite at Mill Canyon contain a suite similar to that of veins in carbonate rocks in Mill Canyon. Veins in basaltic andesite at the Buckhorn gold and silver mine show pyrite and marcasite and geochemical anomalies in mercury and arsenic.

ORE DEPOSITS OF THE PARK CITY MINING DISTRICT

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The Park City district is located approximately 20 miles southeast of Salt Lake City on the eastern slope of the Wasatch Mountains. The district is on an imaginary east-west line formed by the westward extension of the axis of the Uinta Mountains, the Tertiary intrusives in the central Wasatch Mountains, and the intrusive bodies in the Oquirrh Mountains which form the ore deposits in the Bingham Mining district.

Since discovery in 1869 the mesothermal silver-lead-zinc ores have been the source of over $500,000,000 in revenue. Total production from 1875-1967 amounts to 15,810,910 tons averaging 0.07 oz. Au, 15.76 oz. Ag, 8.3% Pb, 4.5% Zn and 0.73% Cu.

The ore deposits are bedded replacements and veins which occur in Paleozoic and Mesozoic sediments and also within Tertiary intrusives. In general the replacement deposits are larger and contain higher values in lead and zinc while carrying lesser but important amounts of silver. They are related to an E-W and NE series of fractures which in places form lode deposits themselves. The veins generally contain higher silver values while carrying lesser amounts of lead and zinc.