UTAH GEOLOGICAL AND MINERALOGICAL SURVEY

QUARTERLY REVIEW

Vol. 1, No. 10

Geologic Investigation in the State of Utah

Fall, 1966

Water Groups Ask Wilderness Delay

The U.S. Forest Service recommendation that acreage in the Ashley and Wasatch National Forests be designated the "High Uintas Wilderness" to protect and preserve its wilderness character recently provoked wide interest and hot controversy.

Both Gov. Calvin L. Rampton and former Utah Gov. George D. Clyde were among those seeking to delay designation of at least part of the area until a survey can be completed to determine if water facilities in the Wilderness will be needed for development of the State's resources.

Other groups and individuals concerned with conservation of natural resources, scientific study and wildlife pleaded with equal fervor that action be taken as soon as possible.

The Forest Service proposed that 322,-998 acres in the two national forests within Summit and Duchesne Counties be designated Wilderness Area. Once designated the region would be closed to building except for administrative purposes.

And . . . it was this restriction that spurred the controversy.

The High Uintas Wilderness recommendation specifically proposes that roads, power lines, *reservoirs* or other facilities — unless specifically authorized by the President of the United States — be prohibited in the Wilderness Area. The resolution's opponents have asked the Forest Service to delay designation of 102,011 acres encompassing the Uinta River drainage — that portion labeled Area B on the *Quarterly's* map. Deferrment is urged to permit the Bureau of Reclamation to finish its current investigation of water requirements for the Ute Indian Unit of the Central Utah Project.

Designation of the entire area would prohibit the building of three damsites possibly important to completion of the Central Utah Project, authorized by the Colorado River Storage Project Act of 1956.

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WE LIVE IN A CHANGING WORLD

Mining's Value to Utah

By

Max H. Kerr, Director* Property Tax Division Utah State Tax Commission

Some years ago, the mining and marketing of coal was extensive and employed many Utah residents.

Some years ago, transportation of goods and persons depended upon horses.

Some years ago, the assessed value of cattle and sheep represented a significant per cent of the total assessment of all property in the State.

REVIVED ACTIVITY

Some years ago, lead-silver mining activity in Utah was very important to the total economy of the State.

Time has passed, and with the passing of time, conditions have changed. We have seen activity in coal steadily decline. In our life time, we have witnessed the most startling changes in modes of transportation, and the relative importance of livestock to the economy of Utah has also substantially declined. We have seen the importance of lead-silver mining diminish almost to the point of vanishing, and then within the past year we have witnessed a revival paced by Kennecott Copper Corporation's Tintic Division operations, near Eureka.

ECONOMIC ROLE

Over the years, mining has played a most important role in the economy of our State. It has been in the past, and it is at the present time, of tremendous importance to the tax structure of Utah. In our examination of the importance of mining, I would like to define mining to include "removing anything of value from the earth."

KENNECOTT COPPER

A discussion of mining in Utah would, I am sure, be incomplete without special attention being given to the Kennecott Copper Corporation's mining, milling, smelting, and refining complex, which is of such primary importance to the economy and to the tax structure of the State.

Here we have one mining operation which consistently accounts for better than one-half of the total mine assessment in the State, excluding oil and gas assessments in recent years. It has for many years been the basis of a large proportion of individual and corporate income and taxes, and many of the following statistics I give you are related to the Kennecott operations in Utah.

ASSESSED VALUES

In order to illustrate the importance of Kennecott to mining in the State, some comparisons may help. In 1960, the total mining assessment, including gas and oil, amounted to \$297,000,000, while Kennecott properties were assessed \$113,000,000.

By 1965, the total mine valuation had dropped to \$266,000,000, of which \$131,000,000 was on Kennecott property. By 1966, although the total mine and gas and oil assessment had again dropped to \$242,000,000, Kennecott had increased from \$131,000,000 in 1965 to \$140,000,000 in 1966.

I learned of an interesting fact recently. Kennecott produces more tons of sulfuric acid per day than it does copper. This acid is vital in steel, oil, and fertilizer production.

FINAL STAGES

Kennecott is now in the final stages of a \$100,000,000 expansion program designed to increase ore production from 90,000 tons per day in 1963 to 108,000 tons when the program is completed. Precipitate copper from waste dumps will grow from 2,250 to 6,000 tons per month. This program demonstrates again that Kennecott is a good neighbor.

MINING ASSESSED

In 1965, the total assessed valuation of all taxable property in the State amounted to \$1,529,000,000. Of this, \$493,000,000 was assessed by the State Tax Commission on property of mines and utilities. Of the \$493,000,000, \$266,000,000 represented mining property — real and personal. This mine assessment represents 17% of the total State assessment. These figures include oil and gas assessments.

In 1965, mining companies, including gas and oil, accounted for \$16,500,000 in so-called county property taxes and in addition paid \$1,736,000 in mine occupation tax and \$1,369,000 in gas and oil occupation tax.

It may be of interest to you to know that over 65% of the property tax goes to support education.

CHANGED MINING

We must recognize that mining in Utah is changing and has been changing to a marked degree in the past few years. As I have pointed out, lead-silver hard rock mining became practically non-existent and only recently shows signs of recovery; also, during this same period, we have witnessed the uranium boom. Oil and gas production has become of major importance to the State economy as well as to the tax structure but, unfortunately, is at present declining.

Since pioneer days, the vast iron deposits near Cedar City were well known, but lay dormant, due to lack of production facilities. In recent years, we have seen steel production become of tremendous importance, particularly to Utah and Iron counties; and with the construction of the Geneva Steel complex, we have seen some allied industrial growth in iron and steel fabrication and hope for more.

CHANGING WORLD

There is at the present time a discernible trend, if you will - from metallics to nonmetallics, or as we some-times refer to them — "Valuable Deposits." In the nonmetallics, we have in Utah many unique situations. We have potash deposits where the potash is only available when there is sufficient moisture in the ground. There is a company which has reserves of nonmetallics sufficient to last some seven hundred years, based upon extraction of one million tons per year. We have another valuable deposit where reserves seem almost unlimited but are, at the present time, more difficult to extract. Oil shale represents a valuable future reserve, and gilsonite exists in vast unknown amounts. Adequate deposits of sand and gravel are important to the building trades and to the highway construction now going on.

I am not trying to give the impression that mining is flourishing at the present time in Utah. However, the present condition is not due to lack of minerals. Exploration, development, engineering, and scientific research, plus a little assistance, price-wise, could materially improve the present situation. A fair and equitable tax climate is also essential.

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^{*}Lecture delivered before College of Mines and Mineral Industries.

Fall, 1966

MORE DIVERSIFIED

Mining, or the extraction of valuable materials from the earth in Utah, is becoming more and more diversified. Notable recent developments have occurred in eastern Utah. I refer to the potentially large scale phosphate development by San Francisco Chemical Company in Uintah County. In 1965, the assessed value of this company's property amounted to nearly \$600,000 and should grow as production increases.

In Grand County, Texas Gulf Sulphur Company has an assessment for 1966 of over \$3,000,000. This company has demonstrated great faith in the future of potash development in Utah.

As is the case in all mining development, the mine itself, the related structures, and machinery and equipment, is just part of the story. Families move in and are housed. Schools must be built and teachers employed. Service industries are stimulated to serve the companies and their employees. According to the University of Utah Bureau of Economic and Business Research, it takes about five persons to serve the employees and the company for each employee of the company; or stated another way, one person in basic mining activity supports five persons in other activities.

SHORT WAIT

In the case of the Texas Gulf Sulphur Company, we did not have long to wait to see a secondary development occur. The company upon locating in Grand County required the only substantial extension of a railroad in recent Utah history, and the 36 mile Denver and Rio Grande Branch from Crescent Junction to Moab and to the potash mine will undoubtedly stimulate further development of the area.

Diversification of the mining industry in Utah is familiar to all of you. We have seen the decline of smelting in Utah, and it has been most discouraging. However, in the development of nonmetallics, there are encouraging aspects which should be considered. In the gypsum industry in Sevier County, we do not have just a mining and/or milling operation. It goes further the product — gypsum is mined and processed and is also involved in a manufacturing operation. Products are imported into Utah which go into the finished goods in the same vicinity.

Phosphates which are strip mined in Uintah County are refined there to a certain point. This material is then shipped to a fertilizer plant where it becomes a finished product, all within the borders of Utah.

Will Little Cottonwood Canyon Be Lost To The Bulldozer?

By A. J. Eardley

Recent newspaper articles describe a proposed new subdivision development at the mouth of Little Cottonwood Canyon, and the opposition to it.

In terms of natural history, the author considers this canyon the most significant square mile in the State. Utah has no similar area to compare with it in crispness, clarity, and majesty of the geological features. More than this, no city and county in North America can

BULLETIN!!!

As *The Quarterly* was going to press, announcement was made of the discovery in Beaver County of two minerals new to Utah.

Dr. James D. Stephens of Western Mining Divisions Research, Kennecott Copper Corp. has identif i e d ettringite, $Ca_6Al_2(SO_4)_3$ $(OH)_{12} \cdot 26H_2O$, from the open pit of the Old Hickory mine in the Rocky Range northwest of Milford.

Dr. James A. Whelan of the College of Mines and Mineral Industries, University of Utah, has reported taking libethenite, $Cu_2(PO_4)$ (OH), from the Atlas mine in the Star Range, southwest of Milford.

William P. Hewitt, Director Utah Geological and Mineralogical Survey

MORE EMPLOYEES

I have heard it said that government, particularly the Federal Government, employs more people in Utah than any other industry, particularly when you include defense industry.

I wonder if this is true if you consider secondary employment which is directly dependent upon some phase of mining. As examples, I offer the following: Geneva Steel, which is not classified as mining even on the assessment rolls, would not be in Utah if it were not for the iron and coal mines. There is a huge power plant located at Castle Gate representing nearly \$7,000,000 in assessed value which would not have been built were it not for the coal mines loboast such a lavish display of nature's craftmanship in its own backyard. It should be preserved!

Here and here only, valley glaciers pushed down from the high peaks to the Bonneville basin to leave a record of the related histories of Lake Bonneville and glacial ice. Little Cottonwood's moraines and shoreline deposits were deciphered recently by Dr. Roger Morrison, geologist, U.S. Geological Survey, who recorded a story so significant geologists throughout the world are reading it.

Here, too, the master crustal crack, the Wasatch fault, whose last movement occurred only a few centuries ago, is displayed so simply any schoolboy can see it and wonder about it. Its features, in photographs and texts, are known to geologists everywhere, for most college textbooks describe the fault and the associated moraines.

Just within the canyon is the vivid contact of the Cottonwood intrusion with the country rock. The granite intrusion, one of the youngest on record in the West, has been dated by radioactive isotopes. The country rock, metamorphic layers of ancient sedimentary rocks, and related structures and minerals have been studied extensively. Contacts of this sort generally must be ferreted out in remote wilderness areas.

Little Cottonwood Canyon is the home of the granite quarry from which rock for Salt Lake's LDS Temple and State Capitol was quarried. Two 50-ton monoliths of granite stand at the triangular road intersection at the mouth of the

(Continued next page)

cated nearby, and this plant does not show up as a mining enterprise. We have the Gadsby Plant right here in Salt Lake which utilizes gas and oil for the generation of power for our many nonmining industries and would not exist in its present form except for mining.

More examples could be given, and I believe that it could be demonstrated that mining is still one of our most basic industries.

I wonder how much of our population would be forced to leave if we had no coal, no gas and oil, no copper, no iron, no valuable deposits!

Lab Work Completed **On Lake Water; 300 Analyses On File**

Each month since establishing 23 sampling stations on the Great Salt Lake, the Utah Survey has collected water samples at 4-foot intervals to the bottom for analyzation in UGS laboratories. Purpose of monthly sampling is to record chemical variations throughout the year. To date 450 samples have been collected. Analyses of about 300 of these samples have been completed and are on open file pending adaptation to computer analysis.

A 4-day attempt to place salt precipitation measuring stations on the north arm of the lake failed in October, when the salt pan failed to support the ducks carrying equipment. Snows and rains had leached the supportive salt pan by the time the October try was made. An attempt during the Thanksgiving recess failed for the same reason.

As a part of his Ph. D. problem, Richard Beard of the U. of U. Chemistry Department, analyzed water samples from Great Salt Lake in an attempt to determine the rare earth content in hrine.

The water was placed in an Arco, Idaho cyclotron which, when activated, produced a high density neutron flux. Neutrons entering the nuclei of atoms changed atomic weights but not the chemical properties of the elements involved, artificially producing short-lived unstable isotopes. The isotopes, in turn, gave off characteristic radiation patterns which enabled him to measure infinitessimal earth quantities.

RARE EARTHS IN **GREAT SALT LAKE BRINE**

Yttrium Group —

- < 2.2·10⁻⁶ ppm Lutecium
 < 7.9·10⁻⁶ ppm Ytterbium
 < 1.3·10⁻⁶ ppm Thulium
 < 2.9·10⁻⁶ ppm Erbium
 < 1.0·10⁻⁶ ppm Holmium Lu
- Yb
- Tm Er
- Ho
- **Terbium Group** Dg
 - 2.9·10⁻⁵ ppm Dysprosium < 3.6·10⁻⁵ ppm Terbium < 7.2·10⁻⁵ ppm Gadolinium ТЬ Gd
 - < 5.5.10⁻⁸ ppm Europium Eu
- **Cerium Group**

 - $\begin{array}{rcl} \mathrm{Sm} &=& 4.5\cdot10^{-5} \text{ ppm Samarium} \\ \mathrm{Nd} &<& 7.7\cdot10^{-3} \text{ ppm Neodymium} \\ \mathrm{Pr} &<& 4.9\cdot10^{-6} \text{ ppm Praseodymium} \end{array}$

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canyon, and these contain the trademarks of the early stone masons. Both quarry and monoliths are part of Utah's history and should be preserved, but so are all the glacial erratics that strew the slopes. These are priceless relics of the once great glaciers.

Dr. Walter P. Cottom, botanist and professor emeritus, U. of U., has worked out a story of the glacial climate that existed during the last advance of the ice. As the glacier descended from higher altitudes, quaking aspen marched down the slopes and covered the moraines. Looking over the morainal slopes today one can imagine their resplendent beauty in the autumn sun a few thousand years ago. A few aspen stands survive at unusually low altitudes.

Here, too, one finds the largest crystal

clear stream of the Wasatch Range. Certainly, with all the inroads of pollution that beset us as our urban areas grow, we must watch this stream and guard it energetically.

The square mile area at the mouth of Little Cottonwood Canyon the writer proposes as a lasting monument would interfer with no natural resource development. Such a monument would conflict in no way with the mineral industry, nor concern the highway builders. The few homes that now exist in Little Cottonwood have not impaired the canyon's natural features; more certainly will.

Immediate steps should be taken by the City, County and State to preserve this area.

*Professor of Geology, University of Utah.

Survey Teams Map Milford Areas During '66 Season

Utah Survey personnel in the vicinity of Milford, Utah, devoted most of the 1966 field season to surface mapping.

After three field seasons, work in the Star District, southwest of Milford, is almost complete. Last summer's UGS team mapped 10 square miles of surface at scales of 1''=400 feet and 1''=800 feet. To date, 25 square miles of surface and 35,000 feet of underground development in the district have been mapped. Underground development has been mapped at a scale of 1''=40 feet.

In addition, the UGS has compiled a relatively complete list of Star District references, and a file of taxpayers of record as of February, 1965. As yet, this information has not been placed in shape for reproduction, but can be obtained from Dr. James A. Whelan, associate professor of mineralogy, University of Utah. Anyone interested in this data may call or write Dr. Whelan at the College of Mines and Mineral Industries or contact Survey offices.

Along with geologic mapping, the UGS currently supports a geophysical study of the area. James W. Schmoker, a U. of U. graduate student in the College of Mines and Mineral Industries, is doing the work as part of his Ph.D. project.

Alteration mapping near Milford was extended in two areas during the summer field season. With the cooperation of the American Mining Company, Dr. Bronson Stringham, chairman of the U. of U.'s Mineralogy Department, mapped approximately 5 square miles of Rocky Range. Dr. Max P. Erickson, associate professor of mineralogy, mapped a block of ground on the east flank of the San Francisco Range and north of the Carbonate mine. Alteration mapping was a cooperative M&MI College and UGS project.

Also, field work, sponsored by the Survey, was completed on a geologic and geochemical study of the Shauntie Hills, southwest of Milford. Data have not been analyzed to the present time, but results will be placed on open file as promptly as possible. Persons wishing to be notified of the open filing date should leave their names with the Survey office.

Cave-Ins Needless Tragedies

PREVENTATIVE MEASURES A MUST

On Oct. 21, a rain-weakened mountain of coal slag poured down on Aberfan, Wales, burying homes, a school and most of the village's children.

A saddened world was shocked to learn engineering precautions could have averted the tragedy.

Aberfan's fate rested on a man-made death trap; Salt Lake City's rests on the capriciously deposited sediments of an ancient lake bottom.

These sediments, like the slag mountain of Aberfan, have taken an unnecessary toll. In the last 10 years, 24 persons have been buried or partially buried in serious cave-ins on construction sites in or near Salt Lake City. Some of the victims were permanently disabled. Twelve of them died horrible deaths (See Table). No one can estimate how many less serious mishaps of this nature have gone unreported.

The simple — if terrible — truth is that none of these accidents needed to occur. Every one of them could have been prevented.

Most of Salt Lake City rests on what was the bottom of Lake Bonneville. The sediments that make up this lake floor range in size from fine clays to coarse boulders. In many places, boulders are mixed with clay or sand. In others, layers are well sorted as to size. The distribution of these components varies, too, both laterally and in depth.

Any contractor or engineer should make it his business to know about the behavior of soil and rock materials and take precautions to insure the safety of his excavation crew.

He should know, for example, that soil heavy with clay can be firm when dry, but dangerously uncertain once it is saturated. He should understand that without clay to hold them, boulders tumble easily from dry sand, and that the latter has a tendency to slump. He should realize that fill material of former excavations can be especially weak. If slip planes intersect the area, it is part of his job to know that the ground along them can simply fall away when its support is gone.

Further, he should familiarize himself with directives issued by the State Industrial Commission which specifically describe safety methods.

There are several ways to prevent trench cave-ins. One of these, proper sloping, is a prime cave-in control. By sloping at an angle of repose to the ground and shoring the walls, most trenches can be made safe. In recent years, the so-called "steel cage" and slide trench equipment have been used with dramatic success as safeguards against cave-ins.

A steel cage can be used on a construction site either at the discretion of the contractor or by orders of the state inspector for the Commission of Industrial Safety. At present, there is no written regulation pertaining to the use of the steel safety cage. The cage is a steel cubical, which is lowered into a trench dug by machinery. Openings at either end permit workmen to install the pipe while well protected by steel. When the pipe section is joined, the man leaves the enclosure. The cage, in turn, is lifted to the top of the trench, and then lowered for the next joint.

Morrison-Knudsen Company, Inc. has tested slide trench equipment successfully in many parts of the country. This device consists of two large steel plates with welded steel arches between them to hold the plates erect and properly spaced. The pipe is laid beneath the arches. Then, as the excavator cuts the ditch, it moves the unit forward.

It should be noted, however, that a knowledge of Salt Lake City's Safety Regulations is not enough to prevent tragic cave-ins. Unfortunately, those regulations, deal mostly with prevention of damage to pipelines and adjacent properties.

Development of improved safeguards should be accompanied by an upgrading of safety codes. Accident prevention should advance with inventive progress. But, more than this, geology must be applied to such engineering problems as trench cave-in prevention.

Salt	Trench Lake City	Cave-Ins y and Vici	nity
Date	Deaths	Rescued	Involved
6/23/56 12/12/57		2	2
7/31/58 11/14/61	6		6
5/19/62 6/27/62	1	2	1 2
5/1/63 8/9/63	1 (8)	1 (5)	2 (13)
2/21/64 2/29/64	1 (9)	1 (7) 1 (8)	1(15) 2(17)
4/14/64 10/23/64	1 (10)	1 (9)	1 (18) 1 (19)
12/22/65 2/14/66		1 (10) 1 (11)	1 (20) 1 (21)
4/27/66 10/7/66	2 (12)	1 (12)	2 (23) 1 (24)

The Vipont property in Box Elder County, Utah, will be explored for silver under a contract from the Office of Mineral Exploration. The contract will enable Thomas P. Miller of Salt Lake City to explore the property by surface drilling methods. Total cost of the work is estimated at \$79,000, of which government participation is 75 per cent.

An important wildcat oil discovery in Duchesne County has been reported by Gulf Oil Corporation.

In a 24-hour test, Ute Tribal No. 2 produced 1,230 barrels of 45-degree gravity oil and 1.3 million cubic feet of gas through 2-inch tubing.

The well, which is located four miles southwest of Duchesne, is on a 52,000acre block. Gulf Oil functions as the operator, and also holds a one-half interest in the block.

Gulf's Ute Tribal No. 1, on the same block about seven miles to the east, is the closest producing well.

Utah Survey efforts to further an understanding of Great Salt Lake and the multitude of problems associated with its study were cited recently by the Utah Geological Society.

Early in September, the Society sponsored its 20th annual Field Conference — this year devoted to a study of the lake. A boat trip and excursions to points of interest above and along Great Salt Lake were conference highlights.

In his letter of appreciation to the Survey director, Walter R. Buss, Weber State College, Ogden, secretary-treasurer of the Society, wrote:

"The Council and members of the Utah Geological Society wish to express appreciation to you and your organization for the enjoyable and informative boat trip on the Great Salt Lake under Robert E. Cohenour as part of the 1966 Field Conference of the Society. Dr. Cohenour and his assistants are to be congratulated, not only for getting the boats ready and conducting the trip, but for the talks and demonstrations concerning the work the Survey is doing to further our understanding of the lake."

The Society's excellent "Guidebook to the geology of Utah, no. 20, *The Great Salt Lake*, edited by William Lee Stokes, can be obtained from the office of the Utah Survey. It includes a fascinating historical sketch and an authoritative discussion of the lake's State versus Federal boundary problems in its 173 pages of technical material.¹

¹Illustrated. \$5.00.

With solution mining tests and exploration drilling at the Bredenbury potash property of Southwest Potash Corp. in Saskatchewan completed, the company announces that a sizable orebody has been indicated and engineering studies are in progress.

To press time, a final decision as to the ultimate feasibility of construction and operation of the potash mine and facilities has not been made.

Development of a commercially feasible solution mining technique for the recovery of potash minerals should have a far reaching effect on Utah's deeply buried potash resources.

Kennecott Copper Corp. and Peabody Coal Co. are working on a proposal for Kennecott to purchase the business of Peabody.

Any agreement reached between the companies is subject to the approval of the boards of both companies and Peabody shareholders. In addition to negotiation of satisfactory financial arrangements, it would be subject also to satisfactory tax rulings and clearances from government agencies.

Based on a share price of about \$47.50 for Peabody common stock, the transaction could involve funds amounting to more than \$465 million. Peabody's business would be continued after the purchase is consummated. The proposed deal would not be expected to be completed until well into 1967.

Gerald M. Park, graduate student in mineralogy at the University of Utah and employee of the Anaconda Company, has received Geochron Labs 1966 Research Grant.

The award was made for the best paper and best problem dealing with isotopic age determinations. Mr. Park's presentation dealt with studies he is making on a series of unusual beryllium deposits in western Utah.

He was awarded five potassium-argon determinations, which, Geochrons noted, are intended to assist him in determining whether the deposits form a metallogenetic province or are unrelated genetically.

Mr. Park's proposal, according to Geochron, "may have great economic impact, as well as providing many answers to geological problems in his area." With laboratory studies in progress and 95 per cent of the field work finished, a UGS economic geology study of the Deep Creek Mountains nears completion.

The area — under study since June, 1964—covers approximately 700 square miles. It extends from the Utah-Nevada border east to Callao, and from Gold Hill south to Pleasant Valley and Partoun.

The work encompasses:

-The mapping of all mines in the area;

-Detailed geology of mining country;

-Geochemical studies of specific regions;

-Water resource research;

—A study of the magnetics of Clifton Flat and Overland Canyon.

Open file reports will be available as completed.

A \$40,000 one-year grant to begin a study of ways to make plants grow on mill tailings has been awarded to Utah State University by the U.S. Bureau of Mines.

The grant is being made under the Solid Waste Disposal Act of 1965. Work will be aimed at determining the factors that prevent growth of most plants on mill tailings and similar wastes, and an attempt will be made to identify resistant species.

Rio Algom Mines Ltd., Toronto, Canada, has acquired a three-year option from HUMECA Exploration Co., a Salt Lake City partnership, to explore and purchase uranium claims in the Big Indian Mining District.

The claims, which cover some 1,850 acres, lie 30 miles south of Moab on the northeast side of the Lisbon fault. HUMECA's drill testing encountered a substantial ore body in this area, which, on the north, has been displaced one foot to the northeast for every foot of drop.

The Canadian firm is a member of the worldwide Rio Tinto-Zinc group of companies, which are interested primarily in development of natural resources. Mining and specialty steels constitute its major operating divisions.

Along with being an important producer of uranium oxide, the firm also works copper-zinc, copper-silver-gold and gold mines in Canada, and conducts an extensive exploration program throughout North America.

Engineering Geologist Joins Survey

Editor's note: The UGS welcomes to its staff Bruce N. Kaliser, engineering geologist. For two years prior to joining the UGS, Mr. Kaliser served as city geologist in Bethlehem, Pa. As an advisor to Bethlehem's Engineering and Water Bureaus, he supervised foundation investigation, location of water transmission lines, watershed development and location and inspection of water wells.

Mr. Kaliser was graduated with honors from the University of Reading, Eng. Upon receiving his B. Sc. degree in 1963, he was awarded a teaching assistantship at Lehigh University in Bethlehem, and completed one year of graduate training before accepting his metropolitan post.

By Bruce N. Kaliser

It is the wish of the UGS to make a fruitful contribution to Utah's development in an increasingly important aspect of the geological sciences . . . engineering geology.

With this aim in mind, the Survey is desirous of maintaining a file which will be of assistance in initial phases of site location and exploration. More than this, the Survey, in general, and the engineering geologist, in particular, are available to act in an advisory capacity for all State and municipal requirements.

The Survey's interest in engineering geology is not newly founded, and two of its publications, Special Studies 10 and 11, deal specifically with this field.

A cursory review of Special Studies 11, Engineering Implications and Geology of the Hall of Justice Excavation, Salt Lake City, Utah, would suggest to the most casual reader the extreme sediment variations possible in as limited an area as a portion of a city block. Special Studies 11 demonstrates for the reader the need for on-site, closelyspaced exploratory probings over most of the metropolitan area.

That the population and industrial heart of Utah is spread out along the Wasatch Front is common knowledge. That this same area has experienced earth tremors in the past and will in the future is a fact many times disregarded. Utilities such as gas lines, aquaducts and reservoirs should be planned and placed with direct concern and respect for the underlying geology and the certain knowledge of future seismic activity.

Platinum Plateau 'Treasure' No Treasure At 3¢ Per Ton

A few weeks ago, a group of men from Walden, Colo., filed claim to 324 acres in Moffat County, saying the plateau was rich in platinum.

All news media carried the story and, in the ensuing excitement, 1,500 claims were filed.

Dreams of gleaning a platinum treasure from the land beneath Colorado's western slopes faded fast, however, when the U.S. Geological Survey amended downward the "grossly exaggerated" \$50 per ton yield figure.

According to the agency, USGS tests of claims in the area showed the platinum yield to be about 3^{ϕ} for each ton of earth, and prohibitive to try to extract.

Anaconda Complex Under Construction

Construction is under way on the Anaconda Company's Western Headquarters Building to be located on a five-acre tract at 1849 W. N. Temple in Salt Lake City.

According to Richard M. Stewart, resident manager, the 32,000 square-foot facility will be comprised of four buildings, three of which will be connected by glass enclosed corridors.

by glass enclosed corridors. The front building will house the Operations and Legal Departments, a library and conference rooms.

A second building will be used as Western Exploration Headquarters and will include photographic, map and drafting rooms. The Exploration Department, which is headed by Dr. John P. Hunt, handles work for all western states except Montana.

Anaconda's new laboratories, which will be located in a third building, will boast micro-chemical, macro-chemical, optical, X-ray, beryllometer, and scintillometer equipment.

A fourth building at the south end of the site, will be used for diamond core storage and analysis.

The geophysical laboratory will continue in its present Tooele location for from three to five years, but eventually will move to the W. No. Temple site, Mr. Stewart said.

The company expects to occupy its new building by April 30, 1967.

Lowell S. Hilpert, Utah Geological Society president and USGS representative, pointed out that "several large samples from the claystone bed, reported in the Press to contain gold and platinum, have been analyzed repeatedly by several different methods" in the USGS' Washington and Denver laboratories.

"Platinum was determined by five methods in the Washington laboratories and by one method in the Denver laboratories. Gold was determined by two methods in the Denver laboratories, and by one method in the Washington laboratories," Mr. Hilpert said.

Results of those tests were as follows:

--Platinum: less than 10 parts per billion, equivalent to .0003 ounces per ton or 3^{ϕ} per ton;

--Gold: less than 20 parts per billion, equivalent to .0006 ounces per ton or 2^{ϕ} per ton;

—Palladium: less than 2 parts per billion, equivalent to .00006 ounces per ton or $\frac{1}{2}$ per ton.

From an historical point of view, it is interesting to note that Moffat County figured prominently in the last century's "Diamond Fraud." For this reason, *Quarterly Review* calls attention to the following excerpt from *The Mineral Resources of Uintah County*, by Salt Lake City attorney Robert G. Pruitt, Jr.

"Local stories declare that Uintah County was the site of the famous Diamond Fraud of 1872, a landmark in the lore of early mining in this country. However, that episode took place in northwestern Moffat County, Colorado, between branches of the west fork of Vermillion Creek, east of Ruby Gulch, on outcrops of a coarse iron-stained sandstone mesa at the foot of Diamond Peak (Hague, 1877). The 'Diamond Moun-tain' of Uintah County, Utah, was known in 1873 as 'Summit Valley' (Powell, 1876). The name was probably changed to Diamond Mountain in deference to the old Diamond brand cattle ranch which grazed livestock in the area (Untermann, personal communication, 1960)."

Bituminous Sand Summer Study

During the summer, a UGS team spent its second field season studying the bituminous sandstones of P. R. Spring.

An additional 775 square miles adjacent to the area dealt with in 1965 were investigated, expanding the total area under investigation to 1,122 square miles.

To date, 38 stratigraphic sections have been measured. The 12 sections completed during the 1966 field season indicate thinning of the saturated sands toward the north.

Outcrop samples from each zone of saturation were taken from 73 localities in the area, and 240 samples will be analyzed for:

-Infrared curve differences;

-Radiometric analysis of the sands; -Gallons of oil per ton;

-Specific gravity of tars and distillates;

-Distillation temperature curves, and

-Trace elements.

It is hoped these analyses will be helpful in deriving a horizontal correlation of the saturated zones.

As a result of this study, the areal extent of saturated outcrops is known to approximate 408 square miles.

Mines Bureau Analyses

Additional U.S. Bureau of Mines' analyses have been received from samplies collected from oil field brines within the State. The results are on open file in the Survey office. Among them are the following:

- 1 hole in the Uinta Basin contains 453 milliliters per liter of boron and 2,664 milliliters per liter of ammonia.
- 3 holes in the Red Wash Field respectively contain 224, 381 and 1,312 milliliters per liter of bromine.

Map Index Error Noted

An error occurred in the printing of the Geologic Map Index of Utah, com-piled by Lehi F. Hintze and Leona Boardman. It is as follows:

- Errata-Sheet II: 61-1, 63-3, 63-2 and 64-1 — erroneously overprinted on Sheet II. Apply to Key to Index Map of Sheet I.
- Errata-Sheet I: 61-16, 63-19, 63-9, 64-12 - erroneously overprinted on Sheet I. Apply to Key to Index Map of Sheet II.

U. Geology Department Rated 34th by ACE

A recent "Assessment of Quality in Graduate Education," released by the American Council on Education, ranks Utah among the top 34 of 55 universities in the nation granting Ph.D. degrees in geology.

It little helps presidents, deans and department chairmen to be told that their university ranks seventh, seventeenth or fifty-seventh in over-all standing," the release states. But "it may help them a great deal to have a rough indication of how the outside world views their relative strength in each of several disciplines.'

The Utah Survey extends congratula-tions to Dr. W. L. Stokes, chairman of the U. of U.'s Geology Department.

Reprint

A reprint from the August, 1966, Bulletin of the Geoolgical Society of America, "Recurrent Structural Disturbance of Colorado Plateau Margin Near Zion National Park, Utah," by Andrew Ed-munds Kurie, can be obtained from the Utah Survey office at a cost of 50¢.

WATER GROUPS ASK DELAY

(Continued from page 1) The State of Utah has had the right since that date to build the damsites in question, and treaties involving water storage facilities exist between the State and the Uintah and Ouray Indians. These treaties allow the State to use Indian water now in exchange for High Uinta water in the future should the need arise.

Damsite studies for Burro, Gilbert and Rockwood, have not been programmed, as yet, because Department of Interior funds, while approved, have not been made available.

In a letter introduced at the public hearing in the Federal Building in Salt Lake City, Gov. Rampton asked that a designation of the Uinta River drainage area be deferred until 1970. This, he said, would permit the Bureau of Reclamation to decide water storage needs for the Central Utah Project's final construction phase.

He pointed out that no opposition to the Wilderness proposal as such exists. It is the immediate designation of the eastern drainage acreage that is disputed.

Former two-term Republican Gov. Clyde told those present: "I fully and completely endorse the position of Gov. Rampton. . . . The future of this state is at stake and we must not take any chances."

Summit and Duchesne County Commissions have also opposed the wilderness designation, contending it would restrict maintenance of existing reservoirs and deter economic growth while

benefitting relatively few people. Palmer B. DeLong, Central Utah Project engineer for the Bureau of Reclamation is on record as saying more time is needed to study water needs dependent on the Uinta Drainage. A survey is tentatively set to be completed in 1969.

An Upper Colorado River Commission resolution also urged "that any action to establish the High Uintas Wilderness be delayed until it can be demonstrated as a result of completed planning that works for the Central Utah Project will not be required within the boundaries of the proposed wilderness area."

While several cities, Utah and Uintah County Commissions and a dozen water user or conservancy districts covering the state urged a similar delay, Floyd C. Iverson, regional forester in charge of the Forest Service's Intermountain Region, said the Wilderness proposal is in the predominant public interest.

"Until alternate storage sites are provided downstream and outside the proposed area, the Forest Service will allow the holders of reservoir permits to maintain existing water storage structures in safe and usable condition in a manner compatible with Wilderness values," he said.

"We suggest," Mr. Iverson continued, "that if it is determined at some future date that water storage facilities within the Uinta River portion . . . are essential, they could be authorized by the President. . .

Former Gov. Clyde felt that leaving such a decision to the President was an unnecessary and impractical imposition.

To press time, the question as to whether or not the headwaters of a large water source are to be closed off to insure the area's natural state remains unresolved.

QUARTERLY REVIEW

State of Utah......Calvin L. Rampton Governor University of Utah.....James C. Fletcher President College of Mines & Mineral Industries......George R. Hill Dean **Utah Geological & Mineralogical** William P. Hewitt Survey..... Director UTAH GEOLOGICAL AND MINERALOGICAL SURVEY 103 Utah Geological Survey Building University of Utah Salt Lake City, Utah 84112