UTAH GEOLOGICAL AND MINERALOGICAL SURVEY

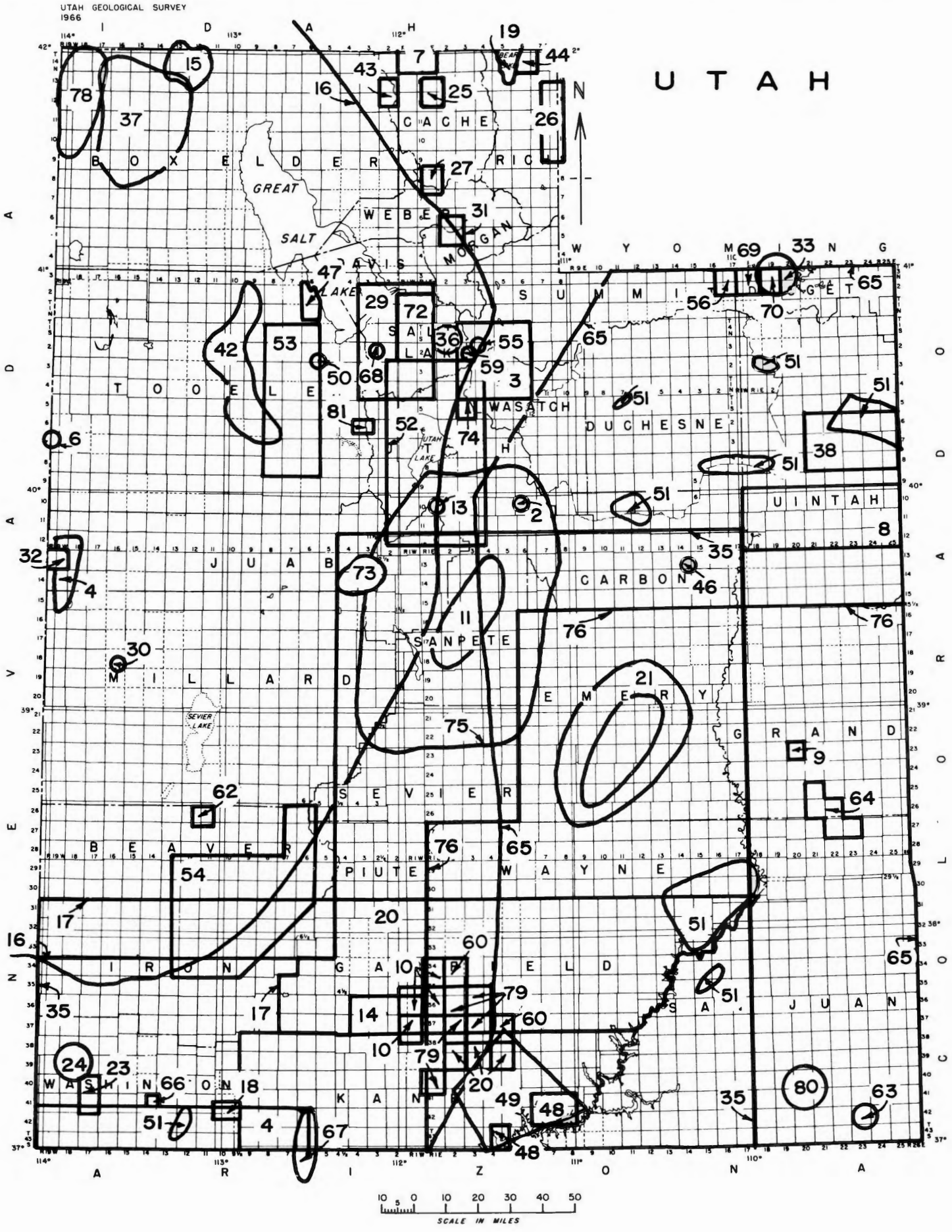
QUARTERLY REVIEW

Vol. 2, No. 2 — *Geologic Investigation in the State of Utah* — *May, 1968*

Summer Field Work in Utah — 1968

The list below represents geological work scheduled for the summer of 1968 in Utah. The reference number in the left column corresponds with a location number for a particular project on the accompanying map. Projects are listed alphabetically by individual and organization.

1	Anderson, John J. Kent State Univ.	Northern Markagunt and southern Tushar plateaus
2	Baer, James L. BYU	Paleoecology of cyclic sediments in the lower Green River (Eocene) of central Utah
3	Baker, C. H., Jr. U.S.G.S.	Water resources of the Heber - Park City - Kamas area
4	Best, M. G. BYU	Plutonic rocks and late Cenozoic basalts of SW Utah
5	Bissell, H. J. BYU	Permo-stratigraphy of the Utah-Arizona-Nevada corner area
6	Bissell, H. J. BYU	Ferguson Flat area, western Utah and eastern Nevada
7	Bjorklund, L. J. U.S.G.S.	Ground-water resources of Cache Valley, Utah-Idaho
8	Black, C. C. Carnegie Museum	Vertebrate Paleontology of the Uinta Basin
9	Bodily, Norman M. BYU	Description of Armored Dinosaur from the upper Jurassic or lower Cretacious, near Moab, Utah
10	Bowers, W. B. U.S.G.S.	Geological maps of the Griffin Point, Upper Valley, Pine Lake, and Henrieville quadrangles, Garfield County, Utah
11	Brown, Robert P. Utah Geol. Survey Univ. of Utah	Gravity studies in Sanpete Valley
12	Bullock, K. C. BYU—Utah Geol. Survey	Iron occurrences of Utah
13	Bushman, J. R. BYU	Pollen and spores from the Santaquin cave archeological site
14	Bushman, J. R. BYU	Palynomorph zonation of the Cretaceous of southern Utah
15	Compton, Robert Stanford Univ.	Geology of the eastern part of the Raft River Mtns. Box Elder Co., Utah
16	Condie, Kent C. Washington Univ. St. Louis, Mo.	Geochemistry of granitic plutons in the eastern Great Basin in Utah and Nevada
17	Cronenwett, Charles E. Univ. of Utah	Regional mineralization of Washington and Iron Counties
18	Dalness, William Univ. of Utah	Study of the Parunuweap Formation, Zion National Park
19	Davidson, Dean F. Utah State Univ.	Geochemical aspects of Bear Lake sediments, Utah-Idaho
20	Doelling, Hellmut H. Utah Geol. Survey	Study of the Garfield County nonmetallic deposits; coal investigation northern Kane County, Kaiparowits coal field, Garfield and Kane Counties
21	Dover, R. J. Utah State Univ.	Paleoecology of the lowermost Carmel Formation (Jurassic) San Rafael Swell, Emery County, Utah
22	Eliason, James F. Utah State Univ.	The upper Devonian formations of central northern Utah
23	Embree, Glenn F. BYU	Chemical and mineralogical variability in the Gunlock diabase flow, Washington County, Utah
24	Finch, W. I. Univ. of Texas	Gold Strike district
25	Galloway, Cheryl L. Utah State Univ.	Structural geology of eastern part of the Smithfield quadrangle, Utah
26	Gere, W. C. U.S.G.S.	Phosphate deposits of the Crawford Mountains, Utah and Wyoming
27	Hardy, Clyde T. Utah State Univ.	Structural geology of James Peak quadrangle, Utah
28	Hardy, Clyde T. Utah State Univ.	Structural geology of Malad and Bannock Ranges, Utah-Idaho
29	Hely, A.G. U.S.G.S.	Water resources of Salt Lake County
30	Hintze, L. F. BYU	Kings Canyon, Confusion Range
31	Hite, R. J. U.S.G.S.	Geologic map of the Ogden 4NW quadrangle, Morgan County, Utah
32	Hogg, Norman C. BYU	Petrology and geochemistry of pelitic schists, eastern Deep Creek Mountains, Juab County, Utah
33	Hoggan, Roger D. BYU	Systematics and paleoecology of the Curtis Formation in the Uinta Mountain area, Daggett County, Utah
34	Hood, J. W. U.S.G.S.	Hydrologic reconnaissances of western basins of Utah
35	Irwin, C. Dennis, Jr. Univ. of New Mexico	Stratigraphic analysis of the lower Triassic and upper Permian strata in southern Utah (Ph.D)
36	Kaliser, Bruce N. Utah Geol. Survey	Engineering geology of the Wasatch front, SE Salt Lake County
37	Khattab, M. M. Utah Geol. Survey Univ. of Utah	Gravity studies in northwestern Utah, Box Elder County
38	Koesoemadinata, R. P. Colo. School of Mines	Stratigraphy and petroleum occurrence, Green River Formation, Red Wash field, Utah
39	Krempasky, George T. U.S. Bureau of Mines	Silver resources of Utah
40	Lessard, R. H. Univ. of Utah	Cretaceous foraminifera of eastern Utah (Ph.D)
41	Marzolf, J. E. UCLA	Navajo sandstone of southeastern Utah (Ph.D)
42	Maurer, Robert E. Univ. of Utah	Geology of the Cedar Mountains (Ph.D)
43	Maw, G. G. Utah State Univ.	Surficial geology of the Cutler Dam quadrangle, Cache and Box Elder Counties, Utah
44	McClurg, Larry W. Utah State Univ.	Erosion and sedimentation of North Eden Creek, Utah-Idaho
45	Nelson, Michael E. Univ. of Utah	Mesozoic-Cenozoic boundary problem, central Wasatch and vicinity
46	Osterwald, F. W. U.S.G.S.	Geology of coal mine bumps, central Utah
47	Palmer, Dennis E. BYU	Geology of Stansbury Island
48	Peterson, Fred U.S.G.S.	Geology of the Cummings Mesa 15 minute quadrange, and SW¼ of the Gunsite Butte quadrangle, Kane and San Juan Counties, Utah and Coconino County, Arizona
49	Peterson, Fred U.S.G.S. thesis	Stratigraphy of Cretaceous formations on the southeastern Kaiparowits region, Utah (Stanford thesis)
50	Peterson, M. S. BYU	Ammonoids from lower Deseret Limestone near Grantsville, Utah


UTAH GEOLOGICAL SURVEY
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51	Ritzma, Howard R. Utah Geol. Survey	Studies of oil impregnated rocks; SE Wayne and NE Garfield Counties; Argyle Creek, southwestern Duchesne County; Virgin River east of St. George; White Canyon, west central San Juan County; Uinta Basin structure
52	Robison, Richard Utah Geol. Survey	Industrial limestones of central Utah
53	Rigby, J. Keith BYU	Geology of the Stansbury Mountains, Tooele County, Utah
54	Rowley, Peter D. Univ. of Texas	Black Mountains Utah and vicinity (Ph.D)
55	Scales, John Univ. of Iowa	Petrography of porphoritic of Flagstaff Mountain area, Utah (Ph.D)
56	Schell, E. M. U.S.G.S.	Geologic map of the Jessen Butte quadrangle, Daggett County, Utah and Sweetwater County, Wyoming
57	Seibert, C. C. J. Univ. of Utah	Stratigraphy and paleontology of phosphate-bearing Mississippian rocks of northern Utah (M.S.)
58	Smith, H. P. Univ. of Utah	Paleoecologic studies in the lower Triassic series of western Utah (Ph.D)
59	Smith, Robert K. Univ. of Iowa	Petrology of the contact metamorphic aureole of the Alta Stock, Utah (Ph.D)
60	Stephens, E. V. U.S.G.S.	Geologic map of the Wide Hollow Reservoir and Seep Flat quadrangles, Garfield and Kane Counties, Utah
61	Stokes, W. L. and Madson, J. Univ. of Utah	Cleveland-Lloyd dinosaur quarry
62	Stringham, Bronson Utah Geol. Survey	Alteration studies of the Beaver Lake Mountains
63	Stuart-Alexander, D. U.S.G.S.	Mule Ear diatreme
64	Sumsion, C. T. U.S.G.S.	Hydrologic investigation of the Spanish Valley area, Grand and San Juan Counties, Utah
65	Szabo, Ernest Univ. of New Mexico	Paleotectonics of Paradox region
66	Taylor, C. M. Exploration Lab., Inc.	West extension of Silver Reef Mining district
67	Threet, Richard L. San Diego State College	The Kanab Creek lineament and possible left slip in the Arizona strip, Kanab, Utah and Fredonia, Arizona, 15 minute quadrangles
68	Tooker, E. W. U.S.G.S.	Geology of Lark quadrangle, underground studies in U. S. and Lark mines; mineral phases in ore and associated wall rock alteration in Bingham Pit, Salt Lake County
69	U.S.G.S.	Geologic map of the Phil Pico Mtn. quadrangle, Daggett County, Utah and Sweetwater County, Wyoming
70	U.S.G.S.	Geologic map of the Gilbert Peak quadrangle Summitt County, Utah and Uintah and Sweetwater Counties, Wyoming
71	Van Dorston, Philip L. Utah State Univ.	Environmental analysis of Swan Peak Formation, northern Utah and southern Idaho
72	Van Horn, Richard U.S.G.S.	Geology of Salt Lake City and vicinity, Utah
73	Wang, Fay Univ. of Utah	Gilson Mountain vicinity (geophysics)
74	Washburn, Alan T. BYU	Morrowan Crinoidea from the southern Wasatch Mountains of central Utah
75	Weiss, Malcolm P. Northern Illinois Univ.	Stratigraphy and petrology of Flagstaff Formation, Wasatch Plateau
76	Wengerd, Sherman A. Univ. of New Mexico	Major petroleum prospects in the Paradox Basin
77	Winkler, Gary R. Univ. of Utah	Geologic history of the Green River
78	Young, A. Univ. of Utah	Goose Creek range, Tooele County (Ph.D)
79	Zeller, H. D. U.S.G.S.	Geologic maps of the Canaan Creek, Carcass Canyon, Dave Canyon, Death Ridge, and Horse Flat quadrangles, Garfield and Kane Counties, Utah
80	Ziony, J. I. UCLA	Analysis of systematic jointing in part of Monument upwarp, southeastern Utah (Ph.D)
81	Utah Geol. Survey Staff	Mercur district, reconnaissance

1967 Utah Geology in Print

This issue of the *Quarterly Review* is devoted primarily to a compilation of the 1967 publications dealing with the geology and mineral industry of Utah. The Utah Geological Survey gratefully acknowledges the assistance of the University of Utah Engineering Library staff, under the direction of Miss Edith Rich, and Mrs. Bernice Y. Smith, technical editor, Utah Geological Survey ,in the compilation of the data contained herein.

It has been our goal to make this listing as complete as possible. If the reader is aware of other pertinent publications that do not appear in the list below, please call them to our attention.

The 1967 publications are listed first by author alphabetically, and then by subject classifications.

An additional listing of publications is on open file in the Utah Geological Survey Office, 103 Utah Geological Survey Building, University of Utah, Salt Lake City, Utah.

AUTHOR INDEX

ADLER, H.H.
(and Sharp, B. J.) Uranium ore rolls occurrence, genesis, and physical and chemical characteristics: *in* Utah Geol. Soc. Guidebook to the Geology of Utah, no. 21, p. 53-77, 1967 .

ANDERSON, C. D.
Telluric current surveys in Utah (abs.): Dissert. Abs., Sec. B, Sci. and Eng., v. 27, no. 4, p. B1183, 1966.

AVERITT, P.
Geologic map of Kanarraville quadrangle, Iron County, Utah: U.S. Geol. Survey Geologic Quadrangle Map GQ-694, scale 1:24,000, 1967.

BAARS, D. L.
(and Parker, J. W., and Chronic, J.) Revised stratigraphic nomenclature of Pennsylvanian System, Paradox Basin: Am. Assoc. Petroleum Geologists Bull., v. 51, no. 3, part 1, p. 393-403, 1967.

BARKER, D. A. See Feth, J. H.

BEATTY, W. B.
Industrial minerals from asbestos to zeolite — Magnesium extraction from Great Salt Lake investigated: Min. Cong. Jour., v. 53, no. 2, p. 46, Feb. 1967.

BEER, L. P.
Ground - water hydrology of southern Cache Valley, Utah: Univ. of Utah Ph.D. thesis, Engineering, 1967.

BEST, M. G.
(and Hamblin, W. K., and Brimhall, W. H.) Preliminary petrology and chemistry of Late Cenozoic basalts in the western Grand Canyon region: Brigham Young Univ. Geology Studies, v. 13, p. 109-123, 1966 (1967).

BISSELL, H. J.
Pennsylvanian and Permian basins in northwestern Utah, northeastern Nevada, and south-central Idaho — Discussion (of paper by Roberts, R. J., and others, 1965): Am. Assoc. Petroleum Geologists Bull., v. 51, no. 5, p. 791-802, 1967.

BJORKLAND, L. J. See Carpenter, C. H.

BLAGBROUGH, J. W.
(and Breed, W. J.) Protalus ramparts on Navajo Mountain, southern Utah: Am. Jour. Sci., v. 265, no. 9, p. 759-772, Nov. 1967.

BLANK, H. R., Jr.
(and Mackin, J. H.) Geologic interpretation of an aeromagnetic survey of the Iron Springs district, Utah: U.S. Geol. Survey Prof. Paper 516-B, p. B1-B14, 1967.

BOTBOL, J. M. See Nackowski, M.P. -2.

BRAY, R. E.
Igneous rocks and alteration in the Carr Fork area of Bingham Canyon, Utah: Univ. of Utah M.S. thesis, Mineralogy, 1967.

BREED, W. J. See Blagbrough, J. W.

BRIMHALL, W. H. See Best, M. G.

BROBST, D. A. See Culbertson, W. C.

BROWN, R. J. See Feth, J. H.

BURGER, J. A.
Mesaverde Group in adjoining areas of Utah, Colorado and Wyoming (abs.): Dissert. Abs., Sec. B, Sci. and Eng., v. 27, no. 3, p. 856B-857B, 1966.

BYRD, W. D. II.
Geology of the bituminous sandstone deposits, southeastern Uinta Basin, Uintah and Grand Counties, Utah: Univ. of Utah M.S. thesis, Geology, 43 p., 1967.

CARLSON, T. R.
(and Erickson, J. D., O'Brian, D. T., and Pana, M. T.) Computer techniques in mine planning: Min. Eng., v. 18, no. 5, p. 53-56, 80, May 1966.

CARPENTER, C. H.
(and Robinson, G. B., Jr., and Bjorklund, L. J.) Ground-water conditions and geologic reconnaissance in the upper Sevier River basin, Utah: U.S. Geol. Survey Water-Supply Paper 1836, 88 p., 1967.

CASE, J. E. See Joesting, H. R.

CASHION, W. B.
1. Carmel Formation of the Zion Park region, southwestern Utah — A review: U.S. Geol. Survey Bull. 1244-J, p. J1-J9, 1967.
2. Geology and fuel resources of the Green River Formation, southeastern Uinta basin, Utah and Colorado: U.S. Geol. Survey Prof. Paper 548, 48 p., 1967.
3. Geologic map of the south flank of the Markagunt Plateau, northwest Kane County, Utah: U.S. Geol. Survey Misc. Geol. Inv. Map I-494, scale 1:62,500, section, 1967.

CHANDLER, M. E. J.
Fruiting organs from the Morrison Formation of Utah, U.S.A.: British Mus. (Nat. History) Bull., Geology, v. 12, no. 4, p. 138-172, 1966.

CHENEY, T. M. See Roberts, R. J. —1, 2.

CHRONIC, J. See Baars, D. L.

COFFMAN, J. S.
(and Service, A. L.) An evaluation of the western phosphate industry and its resources (in five parts) — Part 4, Wyoming and Utah: U.S. Bur. Mines Rept. Inv. 6934, 158 p., 1967.

COHENOUR, R. E.
1. History of uranium and development of Colorado Plateau ores, with notes on uranium production in Utah: *in* Utah Geol. Soc. Guidebook to the Geology of Utah, no. 21, p. 12-22, 1967.
2. Selected references and papers pertinent to uranium exploration: *in* Utah Geol. Soc. Guidebook to the Geology of Utah, no. 21, p. 106-108.
3. See Doelling, H. H. —3.

CONDIE, K. C.
1. Oxygen, carbon dioxide, and sulfur fugacites during diagenesis and low-grade metamorphism of Late Precambrian subgraywackes from northern Utah: Am. Mineralogist, v. 52, nos. 7-8, p. 1153-1160, (July-Aug.) 1967.
2. Petrology of the Late Precambrian tillite (?) in northern Utah: Geol. Soc. America Bull., v. 78, no. 11, p. 1317-1344, Nov. 1967.

COOK, K. L.
1. Rift system in the Basin and Range Province, *in* The world rift system — Internat. Upper Mantle Comm., Symposium Ottawa, 1965: Canada Geol. Survey Paper 66-14, p. 246-279, 1966.
2. Geophysics, mineral exploration tool: Utah Geol. and Mineralog. Survey, *Quarterly Review*, v. 1, no. 11, p. 3-4, 12, 1967.
3. (and Smith, R. B.) Seismicity in Utah, 1850 through June 1965: Seismol. Soc. America Bull., v. 57, no. 4, p. 689-718, 1967.
4. (and Hardman, E.) Regional gravity survey of the Hurricane fault area and Iron Springs district, Utah: Geol. Soc. America Bull. v. 78, no. 9, p. 1063-1076, Sept. 1967.

CORDOVA, R. M.
(and Mower, R. W.) The effect of pumping large-discharge wells on the ground-water reservoir in southern Utah Valley, Utah County, Utah: Utah State Eng. Inf. Bull. 18, 35 p., 1967.

CORNWALL, H. R.
(and Lakin, H. W., Nakagawa, H. M., and Stager, H. K.) Silver and mercury geochemical anomalies in the Comstock, Tonopah, and Silver Reef districts, Nevada-Utah, *in* Geological Survey Research 1967, Chap. B: U.S. Geol. Survey Prof. Paper 575-B, p. B10-B20, 1967.

CRITTENDEN, M. D., Jr.
1. (and Wallace, C. A., and Sheridan, M. J.) Mineral resources of the High Uintas primitive area, Utah: U.S. Geol. Survey Bull. 1230-I, p. I1-I27, 1967.
2. See Roberts, R. J. —1, 2.

CULBERTSON, W. C.
(and Dyni, J. R., and Brobst, D.A.) Eocene Green River Formation — Multiple mineral resource (abs.): Am. Assoc. Petroleum Geologists Bull., v. 51, no. 9, p. 1900, 1967.

DASCH, E. J.
Uranium deposits of northeastern and western Utah: *in* Utah Geol. Soc. Guidebook to the Geology of Utah, no. 21, p. 109-128, 1967.

DAVIDSON, D. M., Jr.
(and Kerr, P. F.) Uranium deposits at Kane Creek, Utah: Soc. Mining Engineers Trans., v. 235, no. 2, p. 127-132, 1966.

DAVIDSON, E. S.
Geology of the Circle Cliffs area, Garfield and Kane Counties, Utah: U.S. Geol. Survey Bull. 1229, 140 p., 1967.

DAVIS, J. W.
Stratigraphy of Flagstaff Formation, southeastern Utah County: Ohio State Univ. M.S. thesis, 1967.

DAVIS, R. A., Jr.
(and Picard, M. D.) Paleocurrents and shoreline orientations in Green River Formation (Eocene), Raven Ridge and Red Wash areas, northwestern Uinta basin; Discussion and reply: Am. Assoc. Petroleum Geologists Bull., v. 51, no. 12, p. 2470-2475, Dec. 1967.

DAY, B. S.
Stratigraphy of the Upper Triassic (?) Moenave Formation of southwestern Utah: Univ. of Utah M.S. thesis, Geology, 145, p., 1967.

de AZVEDO, J. See Williams, S. A.

DOELLING, H. H.
1. Escalante - Upper Valley coal area, Kaiparowits Plateau, Garfield County, Utah: Utah Geol. and Mineralog. Survey Special Studies 20, 16 p., 1967.
2. Uranium deposit of Garfield County, Utah: Utah Geol. and Mineralog. Survey Special Studies 22, 113 p., 1967.
3. (and Cohenour, R. E.) Field trip road log: *in* Utah Geol. Soc. Guidebook to the Geology of Utah, no. 21, p. 150-194.

DYNI, J. R. See Culbertson, W. C.

EARDLEY, A. J.
1. Bonneville chronology — Correlation between the exposed stratigraphic record and the subsurface sedimentary succession: Geol. Soc. America Bull., v. 78, no. 7, p. 907-909, 1967.
2. (and Viavant, W.) Rates of denudation as measured by bristlecone pines, Cedar Breaks, Utah: Utah Geol. and Mineralog. Survey Special Studies 21, 13 p., 1967 .

EGLINTON, G. See Murphy, M. T. J.

EL-SHATOURY, H. M.
Mineralization and alteration studies in the Gold Hill mining district, Tooele County, Utah: Univ. of Utah Ph.D. thesis, Mineralogy, 187 p., 1967.

ERICKSON, B. R.
Fossil bird tracks from Utah: Mus. Observer, v. 5, no. 1, p. 6-12, 1967.

ERICKSON, J. D. See Carlson, T. R.

FAIRBAIM, H. W. See Moorbath, S.

FETH, J. H.
(and Barker, D.A., Moore, L.G., Brown, R. J. and Veirs, C. E.) Lake Bonneville — Geology and hydrology of the Weber Delta district, including Ogden, Utah: U.S. Geol. Survey Prof. Paper 518, 76 p., 1966.

FINCH, W. I.
Geology of epigenetic uranium deposits in sandstone in the United States: U.S. Geol. Survey Prof. Paper 538, 121 p., 1967.

FOUTZ, D. R.
Stratigraphy of the Mississippian System in northeastern Utah and adjacent states (abs.): Dissert. Abs., Sec. B., Sci. and Eng., v. 27, no. 1, p. B208-B209, 1966.

FROST, J. E. See Radtke, A. S. —1.

GARVIN, R. F.
1. Directory of mining industry of Utah — 1965: Utah Geol. and Mineralog. Survey Bull. 79, 94 p., Aug. 1966.
2. Stratigraphy of the Currant Creek Formation, Wasatch and Duchesne Counties, Utah: Univ. of Utah M.S. thesis, Geology, 98 p., 1967.

GILLULY, J.
Chronology of tectonic movements in the western United States: Am. Jour. Sci., v. 265, no. 5, p. 306-331, May 1967.

GRANT, S. K.
Metallization and paragenesis in the Park City district, Utah (abs.): Dissert. Abs., Sec. B, Sci. and Eng., v. 27, no. 8, p. B2804-B2805, 1967.

GROSE, L. T.
(and Hileman, D. H., and Ward, A. E.) Coal resources of southwestern Utah: U.S. Bur. Mines Inf. Circ. 8326, 78 p., 1967.

GROVES, H. L., Jr. See Raup, O. B.

GUDE, A. J., III. See Raup, O. B.

HACKMAN, R. J.
Geologic evaluation of radar imagery in southern Utah: U.S. Geol. Survey Prof. Paper 575-D, p. D135-141, 1967.

HADZERIGA, PABLO
Dynamic equilibria in the solar evaporation of the Great Salt Lake brine (abs.): Mining Eng., v. 18, no. 12, p. 51, 1966.

HAMBLIN, W. K. See Best, M. G.

HAMIL, B. M.
Trace elements in accessory magnetite from Basin and Range quartz monzonites: Univ. of Utah Ph.D. thesis, Geol. Eng., 1967.

HANDY, A. H.
Distinctive brines in Great Salt Lake,

Utah, *in* Geological Survey Research 1967, Chap. B: U.S. Geol. Survey Prof. Paper 575-B, p. B225-B227, 1967.

HARDMAN, E. See Cook, K. L. —4.

HAYS, W. W.
(and Nuttli, O. W., and Scharon, L.) Mapping gilsonite veins with the electrical resistivity method: Geophysics, v. 32, no. 2, p. 302-310, 1967.

HEWETT, D. F.
(and Radtke, A. S.) Silver-bearing black calcite in western mining districts: Econ. Geol., v. 62, no. 1, p. 1-21, 1967.

HIGH, L. R., Jr.
(and Picard, M. D.) Stratigraphic relations of Upper Triassic units, northeastern Utah and Wyoming: Compass, v. 44, no. 2, p. 88-98, 1967.

HILEMAN, D. H. See Grose, L. T.

HILPERT, L. S.
Summary report on the geology and mineral resources of the Bear River Migratory Bird Refuge, Box Elder County, Utah: U.S. Geol. Survey Bull. 1260-C, 10 p., 1967.

HINTZE, L. F. See Rigby, J. K.

HOOD, J. W.
(and others) Developing a state water plan—Ground-water conditions in Utah, spring of 1966: Utah Water and Power Board Coop. Inv. Rept. 4, 95 p., 1966.

HOSE, R. K. See Roberts, R. J. —1, 2.

HOWARD, J. D.
Upper Cretaceous Panther Sandstone tongue of east-central Utah, its sedimentary facies and depositional environments (abs.): Dissert. Abs., Sec. B, Sci. and Eng., v. 27, no. 6, p. B1985, 1966.

HURLEY, P. M. See Moorbath, S.

IMLAY, R. W.
Twin Creek Limestone (Jurassic) in the Western Interior of the United States: U.S. Geol. Survey Prof. Paper 540, 105 p., 1967.

JENSEN, M. L.
Stable isotopes and the origin of uranium deposits of Utah: *in* Utah Geol. Soc. Guidebook to the Geology of Utah, no. 21, p. 78-90, 1967.

JOESTING, H. R.
(and Case, J. E., and Plouff, D.) Regional geophysical investigations of the Moab-Needles area, Utah: U.S. Geol. Survey Prof. Paper 516-C, p. C1-C21, 1966.

JOHNSON, B.
Utah's Dead Sea alive with action: Intermtn. Industry, v. 69, no. 8, p. 6-12, Aug. 1967.

JOHNSON, H. S., Jr.
(and Thordarson, W.) Uranium deposits of the Moab, Monticello, White Canyon, and Monument Valley districts, Utah and Arizona: U.S. Geol. Survey Bull. 1222-H, p. H1-H53, 1966.

KALISER, B. N.
Giant fault straddles S(alt) L(ake Valley) lifeline: Utah Geol. and Mineralog. Survey, *Quarterly Review,* v. 1, no. 11, p. 6-7, 1967.

KATTLEMAN, D. F.
Geology of the Desert Mountain intrusives, Juab County, Utah: Brigham Young Univ. M.S. thesis, Geology, 1967.

KAYSER, R. B.
Bituminous sandstone deposits, Asphalt Ridge, Uintah County, Utah: Utah Geol. and Mineralog. Survey Special Studies 19, 62 p., 1967.

KELLER, O. A. (compiler)
Bibliography of U.S. Geological Survey water resources reports for Utah: Utah State Eng. Inf. Bull. 17, 37 p., 1966.

KERR, P. F. See Davidson, D. M., Jr.

KHAN, M. A.
General geology and sulfide mineralization of Dry Canyon and vicinity, Gunnison Plateau, Sanpete County, Utah: Univ. of Utah M.S. thesis, Geology, 145 p., 1967.

KILBOURNE, D. E.
Remanent magnetic properties of the Mesaverde Group, southwestern Wyoming and northeastern Utah: Univ. of Arizona Ph.D. thesis, Geology, 1967 (abs.); Dissert. Abs., Sec. B, Sci. and Eng., v. 27, no. 12, part 1, p. B4447, 1967.

KLINGMUELLER, L. M. L.
The recognition of inliers in the Wasatch Formation in parts of Rich County, Utah: Univ. of Arizona M.S. thesis, 1967.

KOPF, R. W. See Morris, H. T. —1.

LAKIN, H. W. See Cornwall, H. R.

LANDWEHR, W. R.
Belts of major mineralization in western United States: Econ. Geology, v. 62, no. 4, p. 494-501, June-July 1967.

LINDSAY, D. W.
(and Vickery, R. K., Jr.) Comparative evolution in *Mimulus quattatus* of the Bonneville basin: Evolution, v. 21, no. 3, p. 439-456, 1967.

MABEY, D. R.
(and Morris, H. T.) Geologic interpretation of gravity and aeromagnetic maps of the Tintic Valley and adjacent areas, Tooele and Juab Counties, Utah: U.S. Geol. Survey Prof. Paper 516-D, p. D1-D10, 1967.

MacKENZIE, M. V., Jr.
A digital computer model of terrestrial heat flow refraction: Univ. of Utah M.S. thesis, Geophysics, 99 p., 1967.

MACKIN, J. H. See Blank, H. R.

MARDIROSIAN, C. A. See Nackowski, M. P. —1, 2.

MAUGER, R. L.
A summary of isotopic ages of Colorado Plateau, Utah, mineral deposits: *in* Utah Geol. Soc. Guidebook to the Geology of Utah, no. 21, p. 91-98, 1967.

McCASLIN, J. C.
1. Drilling in Utah's Uinta Basin: Oil and Gas Journal, v. 65, no. 11, p. 141, 1967.
2. In Utah's Kaiparowits basin, Upper Valley quits retirement: Oil and Gas Journal, v. 65, no. 41, p. 203, Oct. 9, 1967.

McCORMICK, A. See Murphy, M.T.J.

MEEVES, H. C.
Nonpegmatic beryllium occurrences in Arizona, Colorado, New Mexico, Utah, and four adjacent states: U.S. Bur. Mines Rept. Inv. 6828, 68 p., 1966.

MILLER, R. W. See Mitchell, J. E.

MITCHELL, J. E.
(and West, N. E., and Miller, R. W.) Soil physical properties in relation to plant community patterns in the shadscale zone of northwestern Utah: Ecology, v. 47, no. 4, p. 627-630, 1966.

MOORE, L. G. See Feth, J. H.

MOORBATH, S.
(and Hurley, P. M., and Fairbaim, H. W.) Evidence for the origin and age of some mineralized Laramide intrusives in the southwestern United States from strontium isotope and rubidium-strontium measurements: Econ. Geology, v. 62, no. 2, p. 228-236, March-April 1967.

MORRIS, H. T.
1. (and Kopf, R. W.) Breccia pipes in the West Tintic and Sheeprock Mountains, Utah, *in* Geological Survey Research 1967, Chap. C: U.S. Geol. Survey Prof Poper 575-C, p. C66-C71, 1967.
2. See Mabey, D. R.
3. See Roberts, R. J. —1, 2.

MOWER, R. W.
1. Causes of fluctuations in the rate of discharge of Clear Lake Springs, Millard County, Utah: U.S. Geol. Survey Water-Supply Paper 1839-E, p. E1-E31, 1967.
2. See Cordova, R. M.

MURPHY, M. T. J.
(and McCormick, A., and Eglinton, G.) Perhydro-carotene in the Green River Shale: Science, v. 157, no. 3792, p. 1040-1042, 1967.

NACKOWSKI, M. P.
1. (and Mardirosian, C. A.) Trend surface analysis of trace chemical data, Park City district, Utah (abs.): Econ. Geology, v. 62, no. 6, p. 873, Sept. - Oct. 1967.
2. (and Mardirosian, C. A., and Botbol, J.M.) Trend surface analysis of trace chemical data, Park City district, Utah: Econ. Geology, v. 62, no. 8, p. 1072-1087, Dec. 1967.

NAKAGAWA, H. M. See Cornwall, H. R.

NELSON, E.
Impact of uranium on the economy of the State and the southeastern Utah area: *in* Utah Geol. Soc. Guidebook to the Geology of Utah, no. 21, p. 99-105, 1967.

NORRIS, J. W.
Seismic characteristics of coal-mine rockbursts in Utah: Univ. of Utah M.S. thesis, Geophysics, 79 p., 1967.

NUTTLI, O. W. See Hays, W. W.

O'BRIAN, D. T. See Carlson, T. R.

OIL AND GAS JOURNAL
1. Bridger Lake makes wildcats a must for Green River's south flank: Oil and Gas Journal, v. 65, no. 38, p. 140-143, Sept. 18, 1967.
2. Chevron hits prolific new oiler in northeastern Utah: Oil and Gas Journal v. 65, no. 49, p. 49, Dec. 4, 1967.

ORLANSKY, R.
Palynology of the Upper Cretaceous Straight Cliffs Sandstone, Garfield County, Utah: Univ. of Utah Ph.D. thesis, Geology, 186 p., 1967.

PANA, M. T. See Carlson, T. R.

PARKER, J. W. See Baars, D. L.

PICARD, M. D. See High, L. R., Jr.; Davis, R. A., Jr.

PLOUFF, D. See Joesting, H. R.

POLZER, W. L.
(and Roberson, C. E.) Calculation of ion activity products for a brine from the Bonneville Salt Flats, Utah, *in* Geological Survey Research 1967, Chap. C: U.S. Geol. Survey Prof. Paper 575-C, p. C116-C119, 1967.

RADTKE, A. S.
1. (and Taylor, C. M., and Frost, J. E.) Bismuth and tin minerals in gold- and silver-bearing sulfide ores, Ohio mining district, Marysvale, Utah: U.S. Geol. Survey Prof. Paper 575-D, p. D127-D180, 1967.
2. See Hewett, D. F .

RAUP, O. B.
(and Gude, A. J., 3rd, and Groves, H. L., Jr.) Rare-earth mineral occurrence in marine evaporites, Paradox basin, Utah, *in* Geological Survey Research 1967, Chap. C: U.S. Geol. Survey Prof. Paper 575-C, p. C38-C41, 1967.

RICH, M.
Donezella and *Dvinella,* widespread algae in Lower and Middle Pennsylvanian rocks in east-central Nevada and west-central Utah: Jour. Paleontology, v. 41,

no. 4, p. 973-980, 1967.
RIGBY, J. K.
(and Hintze, L. F.) Field trip exit-entrance log — Salt Lake City to Moab: *in* Utah Geol. Soc. Guidebook to the Geology of Utah, no. 21, p. 129-149, 1967.
RIGO, R. J.
Middle and Upper Cambrian stratigraphy in the autochthon and allochthon of northern Utah: Brigham Young Univ. M.S. thesis, Geology, 1967.
RITZMA, H. R.
1. Proposed wilderness may hide oil: Utah Geol. and Mineralog. Survey *Quarterly Review*, v. 1, no. 11, p. 1-2, 1967.
2. In Utah's Boundary Butte field, Sinclair increases oil-field production and heightens interest in Four Corners: Oil and Gas Journal, p. 113-114, May 29, 1967.
ROBERSON, C. E. See Polzer, W. L.
ROBERTS, R. J.
1. (and Crittenden, M. D., Jr., Tooker, E. W., Morris, H. T., Hose, R. K., and Cheney, T. M.) Reply (to discussion by W. P. Hewitt of "Pennsylvanian and Permian basins in northwestern Utah, northeastern Nevada, and south-central Idaho," 1965): Am. Assoc. Petroleum Geologists Bull. v. 50, no. 7, p. 1524, 1966.
2. (and Crittenden, M.D., Jr., Tooker, E. W., Morris, H. T., Hose, R. K., and Cheney, T. M.) Reply (to discussion by H. J. Bissell of "Pennsylvanian and Permian basins in the northwestern Utah, northeastern Nevada, and south-central Idaho," 1965): Am. Assoc. Petroleum Geologists Bull., v. 51, no. 5, p. 802-803, 1967.
ROBINSON, G. B., Jr. See Carpenter, C. H.
ROBISON, R. A.
Ontogeny of *Bathyuriscus fimbriatus* and its bearing on affinities of cornnexochid trilobites: Jour. Paleontology, v. 41, no. 1, p. 213-221, 1967.
ROEHM, L. H.
Deformation measurements of Flaming Gorge Dam: ASCE Structural Eng. Conf. — Preprint 486, 23 p., May 8-12, 1967.
ROSE, A. W.
Trace elements in sulfide minerals from the Central district, New Mexico and the Bingham district, Utah: Geochim. et Cosmochim. Acta, v. 31, no. 4, p. 547-585, 1967.
ROSTVEDT, J. O.
(and others) Summary of floods in the United States during 1962: U.S. Geol. Survey Water-Supply Paper 1820, p. 11, 17-18, 106-108, 1967.
SALEKNEJAD, H.
Some empirical correlations among some physical properties of mine rocks: Univ. of Utah M.S. thesis, Mineralogy, 1967.
SCHARON, L. See Hays, W. W.
SCHNEIDER, M. C.
Early Teritiary continental sediments of central and south-central Utah: Brigham Young Univ. M.S. thesis, Geology, 1967.
SERVICE, A. L. See Coffman, J. S.
SHARP, B. J. See Adler, H. H.
SHERIDAN, M. J. See Crittenden, M. D., Jr. —1.
SCHROEDER, J. F., Jr.
Landslides of Utah: Univ. of Utah Ph.D. thesis, Geology, 281 p., 1967.
SMITH, R. B. See Cook, K. L. —3.
STAGER, H. K. See Cornwall, H. R.
STEWARD, J. H. See Wilson, R. F.
STOKES, W. L.
1. Relation of fault trends and mineralization, eastern Great Basin (abs.): Mining Eng., v. 18, no. 12, p. 46, 1966.
2. A survey of southeastern Utah uranium districts: *in* Utah Geol. Soc. Guidebook to the Geology of Utah, no. 21, p. 1-11, 1967.
3. Stratigraphy and primary sedimentary features of uranium occurrences of southeastern Utah: *in* Utah Geol. Soc. Guidebook to the Geology of Utah, no. 21, p. 32-52, 1967.
STRINGHAM, B.
Hydrothermal alteration near the Horn Silver mine, Beaver County, Utah: Utah Geol. and Mineralog. Survey Special Studies 16, 35 p., 1967.
TAYLOR, C. M. See Radtke, A. S. —1.
THOMSON, K. C.
Structural features of southeastern Utah and their relations to uranium deposits: *in* Utah Geol. Soc. Guidebook to the Geology of Utah, no. 21, p. 23-31, 1967.
THORDARSON, W. See Johnson, H. S., Jr.
TOMKINS, J. Q.
Polygonal sandstone features in Boundary Butte anticline area, San Juan County, Utah — Reply (to discussion of 1965 paper by J. T. Neal, 1966): Geol. Soc. America Bull., v. 77, no. 11, p. 1331-1332, 1966.
TOOKER, E. W. See Roberts, R. J. —1, 2.
U.S. GEOLOGICAL SURVEY
Aeromagnetic map of the San Francisco Mountains and vicinity, southwestern Utah: U.S. Geol. Survey Geophys. Inv. Map GP-598, scale 1:62,500, 1966.
UTAH GEOLOGICAL SOCIETY
Uranium districts of southeastern Utah: edited by Lehi F. Hintze, J. Keith Rigby, and Byron J. Sharp; Guidebook to the Geology of Utah, no. 21, 188 p., 1967.
UTAH MINING ASSOCIATION (compiler)
An historical, operational and economic review of Utah's mining industry: 3rd Edition, 135 p., 1967.
VAUGHN, P. P.
Evidence and ossified vertebrae in actinopterygian fish of Early Permian age, from southeastern Utah: Jour. Paleontology, v. 51, no. 1, p. 151-160, 1967.
VEIRS, C. E. See Feth, J. H.
VIAVANT, W. See Eardley, A. J. —2.
VIKERY, R. K., Jr. See Lindsay, D. W.
WADDELL, K. M.
Reconnaissance of the chemical quality of water in western Utah — Part 1, Sink Valley area, drainage basins of Skull, Rush, and Government Creek Valleys, and the Dugway Valley-Old River Bed area: Utah Geol. and Mineralog. Survey Water-Resources Bull. 9, part 1, p. 1-15, 1967.
WALLACE, C. A. See Crittenden, M. D., Jr. —1.
WARD, A. E. See Grose, L. T.
WARNER, M. M.
Sedimentational analysis of the Duchesne River Formation, Uinta Basin, Utah: Geol. Soc. America Bull., v. 77, no. 9, p. 945-957, 1966.
WEST, N. E. See Mitchell, J. E.
WILEY, D. R.
Petrology of bituminous sandstones in the Green River Formation, southeastern Uinta Basin, Utah: Univ. of Utah M.S. thesis, Geology, 94 p., 1967.
WILLIAMS, P. L.
Stratigraphy and petrography of the Quichapa Group, southwestern Utah and southeastern Nevada: Univ. of Washington Ph.D. thesis, 182 p., 1967.
WILLIAMS, S. A.
(and de Azvedo, J.) Austinite from Gold Hill, Utah: Am. Mineralogist, v. 52, nos. 7-8, p. 1224-26, July-Aug., 1967.
WILSON, R. F.
1. Witmore Point, a new member of the Moenave Formation in Utah and Arizona: Plateau, v. 40, no. 1, p. 29-40, 1967.
2. (and Steward, J. H.) Correlation of Upper Triassic and Triassic (?) formations between southwestern Utah and southern Nevada: U.S. Geol. Survey Bull. 1244-D, p. D1-D20, 1967.
WRIGHT, P. M.
Geothermal gradient and regional heat flow in Utah (abs.): Dissert. Abs., Sec. B, Sci. and Eng., v. 27, no. 4, p. B1196, 1966.
ZABRISKIE, W. E.
Petrology and petrography of Permian carbonate rocks Arcturus basin, Nevada and Utah: Brigham Young Univ. M.S. thesis, Geology, 1967.
ZAZOU, S. M.
A faunule from a shale unit in the lower Ely Formation, west-central Utah: Univ. of Utah M.S. thesis, Geology, 66 p., 1967.

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Editor's note: In press is a supplement to the May Quarterly, which will include a continuation of the above bibliography and introductory article and a bibliography relative to field studies made in southeastern Utah by Ohio State University Professors Edmund Spieker, and James W. Collinson.

UTAH GEOLOGICAL AND MINERALOGICAL SURVEY

SUPPLEMENT TO QUARTERLY REVIEW

Vol. 2, No. 2 *Geologic Investigation in the State of Utah* *May, 1968*

Ohio State University Field Work

By JAMES W. COLLINSON
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A special interest in the geology of central Utah by Ohio State University extends back to 1924, the year E. M. Spieker joined its faculty.

Professor Spieker had been supervising field parties of the U.S. Geological Survey in the region since 1921. His first student to work in central Utah, S. L. Schoff, completed an M.A. in 1931 and a Ph.D. in 1937.

With the advent of the field station in 1947, many more students were introduced to the challenging geology of the region. Since then, 555 geology majors from Ohio State and 15 other colleges and universities have completed the rigorous field course. The station has been served by 22 different staff members, including representatives from 10 other institutions.

This coming summer, the staff and students of Northern Illinois University are joining the program.

Geologic problems in central Utah have been the subject of 31 M.S. theses and 12 Ph.D. dissertations at Ohio State. By 1956, Ohio State geologists had completed the geologic mapping of all Sanpete County and large parts of the surrounding counties.

One of the great contributions to the success of the field station has been the hospitality of the citizens of Ephraim and Sanpete County and the cooperation of Snow College, which rents part of its facilities to Ohio State each summer.

The Ephraim Lions Club sponsors an annual picnic at which Ohioans and Utahns match their athletic prowess in softball and raise their voices in a songfest. Several Ohio State boys have married girls from Sanpete Valley.

During initial planning for the field-training program, Professor Spieker considered experimenting with a course to introduce geology to beginning students in the field. These plans were put aside for many years, as it was all the station could do to accommodate the returning veterans and the upsurge of geology majors in the 1950's.

In 1962, the National Science Foundation agreed to support a proposal by Professor Spieker for an institute in Utah to introduce geology to high school science teachers.

Each summer, out of several hundred applicants, 25 teachers from all over the United States have been invited to participate and to bring their families to Ephraim.

This year the proposal was renewed for another three years and the number of stipends was increased to 28.

And finally, this summer Ohio State, in cooperation with Northern Illinois University, is initiating the long-deferred field program in introductory geology for college students.

Presently the professional-level course for geology majors is eight weeks long. Most students travel to Ephraim in a caravan of Ohio State field vehicles, and make many geologic stops along the way.

The course begins with a reconnaissance of the region. Short study projects introduce the class to a variety of rocks, structures, and landforms, and at the same time develop skill in the field methods.

During the last half of the course the classes divided into parties of two or three students, which are assigned to map field areas of 10 to 12 square miles. Each area includes a variety of structural and stratigraphic problems that are subject to several interpretations. Maps are compiled on aerial photos and topographic sheets.

At mid-season the class travels to the canyon country of southern Utah and adjacent Arizona, and visits Bryce, Cedar Breaks, Zion, and Grand Canyon National Parks. The trip culminates in an overflight of the canyon country and central Utah.

The vitality of a field-training program is strongly influenced by the continuous challenge of related research in the surrounding region.

Now that the reconnaissance and field-mapping stages in the investigation of the region are mostly completed, Profs. E. M. Spieker and J. W. Collinson, Ohio State University, and M. P. Weiss, Northern Illinois University, with the support of the U.S. Geological Survey, plan to compile all previous maps into a uniform series of quadrangle maps.

It is hoped that this compilation will serve as a basis for future investigations into problems solved by specialized work in such fields as geochemistry, geophysics, and sedimentary petrology.

COURSE BACKGROUND

By EDMUND M. SPIEKER
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For many years, I had little faith in college field-training courses. Experience in USGS field parties, with assistants who were alumni of such courses, convinced me they had never been caused to do any real field work, or had been instructed by men who knew nothing about it.

I used to say they would have been better off, if they had never had such a course; so, during the first 20 years or so of my tenure in the Department of Geology, I had nothing to do with the field course then operated by the department.

I thought then, the only effective way for a beginner to get sound training would be to work as assistant in a party at genuine field work, under the leadership of a competent field geologist. I actually guided some of my students into such experience.

About the time of World War II, however, I began to think that a field course, run — as nearly as possible

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like projects of the USGS — on a strictly professional plane, with students taking full responsibility for the study and mapping of definite areas . . . might not only do the job, but, possibly, do it better. Emphasis might be laid on training and variety of experience — with the faculty merely helping in the work, and showing by example how it should be done.

Therefore, at the end of the war, faced with a surge of students from war theaters, eager to get on with their studies and to make up for years lost, I decided to give it a trial.

In the summer of 1946, I went to the area in Utah, where I had done most of my own field work. Centering on Sanpete Valley, I searched for a suitable site, on which to establish a field station . . . I looked over five possible locations — three abandoned CCC camps, a POW enclave, relinquished by the government at war's end, and Snow College facilities in Ephraim.

I was chary about the geology accessible from Ephraim. . . It seemed both too complex and not well enough exposed for beginners. To the south, east of Salina, for example, there was plenty of well-exposed geology, combining the complex with an abundance of the simple. However, largely under the gentle but persistent suasion of S. S. van Boskirk in the office of the Manti National Forest at Ephraim, I yielded to the blandishments of Snow College, and decided to settle there.

I consoled myself with the thought that the mixture in that area of the simple (not much of it) and the complex might, after all, be better than a dominance of the simple.

At summer's end, then, I worked out an agreement with President Nuttall of Snow College that later was formally ratified between him and President Bevis of Ohio State.

In June of 1947, the first contingent of students traveled in convoy from Columbus to Ephraim to launch the operation.

We started out under severe logistic difficulties. We had a hard time getting field equipment, and that year, waiting lists for new automobiles were very long. We did not actually know, until mid-June, whether we would be able to go, or not. Thanks to the influence of prominent alumni in Detroit and to the friendly ministrations of John B. Fullen, Alumni Secretary, we got (out of turn) four Plymouth station wagons and a big, red Ford truck. The operation was under way.

We had already obtained, in 1945, a brand-new Army surplus jeep, (cost $700, plus $50 to put it together) and a fine Ford station wagon (cost $1,230); so we were adequately set up for transportation. The jeep served well from the beginning, and, despite more than 20 years in rugged mountain areas, where it has been called upon to go almost anywhere (commonly across country away from roads or trails), it is still in service. Its fractured frame is welded in several places, and there are other scars, but the engine has never been opened. However, it is probably seeing its last days as a fully useful field vehicle.

Note: Dr. Edmund M. Spieker has devoted much of his career in geology both as geologist for the United States Geological Survey and as professor of geology at Ohio State University, to Sanpete County and adjoining areas. Through his work and that of his students and faculty associates, the stratigraphic and structural relationships of the complex group of Mesozoic and Tertiary rocks in this area have been determined. Students who made thesis studies in central Utah have since become distinguished scientists and leaders in their profession, and their studies represent major contributions to the geology of Utah. The following bibliography is an impressive indication of the breadth and depth of their endeavors. The Utah Geological Survey is happy to bring this work and the Ohio State University Geology Summer Camp to the attention of readers of the *Quarterly*.

Eugene Callaghan,
Assistant Director, UGMS

Our first experience showed emphatically that I had been wrong in my assumptions as to the needs of beginners, but right in my final decision as to location of the field station.

For one thing, all but one of the students had just returned from the war, where they had undergone rugged life on the battlefields. The rigors of field work in the mountains were as nothing to them — they took everything in stride — and were eager to get on. They were more mature than the average college senior, and appreciated being given full responsibility for their jobs; so they accomplished more than has any group that followed them. Indeed, some of them managed — beyond the requirements of the training program — to get the data for Masters' theses, of which we have no cause to be ashamed.

Above all, I discovered something that I confess had never occurred to me: because they have no experience, beginners do not realize how difficult complex geology is. They simply barge in, systematically observe and collect data, and wait for interpretation and understanding to come when they can. This spirit and this mode of operation have prevailed ever since.

Special homage is due Dr. Charles H. Summerson, without whose hard, devoted work I could neither have organized the operation, nor put it through its first season. Dr. Summerson joined our faculty in the Spring Quarter of 1947. One principal duty then lay before him — to assist me in the launching of the field program.

As a matter of fact, in view of the experiences of later years, I have often wondered how we two managed to get through the first season, with 30 ambitious students and an inordinately stiff program.

All I can say is, we worked very hard.

OHIO STATE U.

Bibliography

BABISAK, JULIUS
The geology of the southeastern portion of the Gunnison Plateau, Utah: Ohio State Univ. M.S. thesis, 1949.

BACHMAN, MATTIAS E.
Geology of the Water Hollow fault zone, Sevier and Sanpete Counties, Utah: Ohio State Univ. M.S. thesis, 1959.

BALDY, MARK B.
Molluscan faunas of the Lower Flagstaff Formation, Fairview Canyon, Sanpete County, Utah: Sterkiana, no. 29, p. 1-8, 1968.

BAUGHMAN, RUSSELL L.
The geology of the Musinia graben area, Sevier and Sanpete Counties, Utah: Ohio State Univ. M.S. thesis, 1959.

BAYLEY, RICHARD W.
A heavy mineral study of the Morrison Formation of south-central Utah: Ohio State Univ. M.S. thesis, 1950.

BONAR, CHESTER M.
Geology of the Ephraim area, Utah: Ohio State Univ. M.S. thesis, 1948.

BURMA, BENJAMIN H.
(and Hardy, Clyde T.) Pre-North Horn orogeny in Gunnison Plateau, Utah: Am. Assoc. Petroleum Geologists Bull., v. 37, no. 3, p. 549-553, 1953.

COOPER, JOHN E.
Petrography of the Moroni Formation, southern Cedar Hills, Utah: Ohio State Univ. M.S. thesis, 1956.

DAVIS, JAMES W.
Stratigraphy of the Flagstaff Formation, southeastern Utah County, Utah: Ohio State Univ. M.S. thesis, 1967.

FAGADAU, SANFORD P.
An investigation of the Flagstaff Limestone between Manti and Willow Creek canyons, in the Wasatch Plateau, central Utah: Ohio State Univ. M.S. thesis, 1949.

FAULK, NILES R.
The Green River Formation in the Manti-Spring City area of central Utah: Ohio State Univ. M.S. thesis, 1948.

FOGRASCHER, ARTHUR
The stratigraphy of the Green River and Crazy Hollow Formations of part of the Cedar Hills, central Utah: Ohio State Univ. M.S. thesis, 1956.

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FRAZIER, NOAH A.
A heavy mineral study of the Morrison (?) Formation and the Indianola Group of central Utah: Ohio State Univ. M.S. thesis, 1951.

GILL, JAMES R.
Flagstaff Limestone of the Spring City-Manti area, Sanpete County, Utah: Ohio State Univ. M.S. thesis, 1950.

GILLILAND, WILLIAM N.
1. Geology of the Gunnison quadrangle, Utah: Ohio State Univ. Ph.D. dissertation, 1948.
2. Geology of the Gunnison quadrangle, Utah: Nebr. Univ. Studies, new ser., no. 8, 101 p., 1951.
3. (and LaRocque, Aurèle) a new *Xenohelix?* from the Paleocene of Utah: Jour. Paleontology, v. 26, no. 3, p. 501-504, 1952.
4. Another Tertiary crustal disturbance in Utah: Am. Assoc. Petroleum Geologists Bull., v. 36, no. 7, p. 1461-1464, 1952.
5. Sanpete - Sevier Valley anticline of central Utah: Geol. Soc. America Bull. v. 74, no. 2, p. 115-124, 1963.

GUNDERSEN, WAYNE C., and GILLILAND, WILLIAM N.
Stratigraphic reflections of the Sanpete-Sevier Valley anticline of central Utah: Trans. of the New York Acad. of Sciences, Series II, v. 29, No. 6, p. 686-699, 1967.

HARDY, CLYDE T.
1. Stratigraphy and structure of a portion of the western margin of the Gunnison Plateau, Utah: Ohio State Univ. M.S. thesis, 1948.
2. Stratigraphy and structure of the Arapien Shale and the Twist Gulch Formation in Sevier Valley, Utah: Ohio State Univ. Ph.D. dissertation, 1949.
3. Eastern Sevier Valley, Sevier and Sanpete Counties, Utah — with reference to formations of Jurassic age: Utah Geol. Mineralog. Survey Bull. 43, 98 p., 1952.
4. (and Muessig, Siegfried J.) Glaciation and drainage changes in the Fish Lake Plateau, Utah: Geol. Soc. America Bull., v. 63, no. 11, p. 1109-1116, 1952.
5. (and Zeller, Howard D.) Geology of the west-central part of the Gunnison Plateau, Utah: Geol. Soc. America Bull., v. 64, no. 11, p. 1261-1278, 1953.
6. See Burma, Benjamin H.

HAYS, JAMES D.
A study of the South Flat and related formations of central Utah—part I: petrology, part II: palynology: Ohio State Univ. M.S. thesis, 1960.

HUNT, ROBERT E.
1. The geology of the Dry Canyon region, Gunnison Plateau, Utah: Ohio State Univ. M.S. thesis, 1948.
2. The geology of the northern part of the Gunnison Plateau Utah: Ohio State Univ. Ph.D. dissertation, 1950.
3. South Flat Formation, new Upper Cretaceous formation of central Utah: Am. Assoc. Petroleum Geologists Bull., v. 38, no. 1, p. 118-128, 1954.

JOHNSON, MIKE S.
Geology of the Twelve-Mile Canyon area, central Utah: Ohio State Univ. M.S. thesis, 1949.

KATHERMAN, VANCE E.
The Flagstaff Limestone on the east front of the Gunnison Plateau of central Utah: Ohio State Univ. M.S. thesis, 1949.

KATICH, PHILIP J.
1. Stratigraphy and paleontology of the pre-Niobrara Upper Cretaceous rocks of Castle Valley, Utah: Ohio State Univ. Ph.D. dissertation, 1951.
2. Recent evidence for Lower Cretaceous deposits in Colorado Plateau (Utah): Am. Assoc. Petroleum Geologists Bull., v. 35, no. 9, p. 2093-2094, 1951.
3. Occurrence of *Tempskya* in the Lower Cretaceous of the western interior (Utah): Jour. Paleontology, v. 26, no. 4, p. 677, 1952.
4. Source direction of Ferron Sandstone in Utah: Am. Assoc. Petroleum Geologists Bull., v. 37, no. 4, p. 858-861, 1953.
5. Cretaceous and early Tertiary stratigraphy of central and south-central Utah with emphasis on the Wasatch Plateau area: *in* Intermountain Assoc. Petroleum Geologists, 5th Ann. Field Conf. 1954, p. 42-54, 1954.
6. Some notes on the Cretaceous faunas of eastern Utah and western Colorado: *in* Intermountain Assoc. Petroleum Geologists, 7th Ann. Field Conf. 1956, p. 116-119, 1956.
7. Cretaceous of southeastern Utah and adjacent areas: *in* Intermountain Assoc. Petroleum Geologists, Guidebook, 9th Ann. Field Conf. 1958, p. 193-196, 1958.

KHIN, M. AUNG
The geology of the district north of Indianola, Utah County, Utah: Ohio State Univ. M. S. thesis, 1956.

KUCERA, RICHARD E.
Geology of the Joes Valley and north Dragon area, central Utah: Ohio State Univ. M.S. thesis, 1954.

LA ROCQUE AURÈLE
1. See Gilliland, William N. —3.
2. Tertiary mollusks of central Utah: *in* Intermountain Assoc. Petroleum Geologists, 7th Ann. Field Conf., 1956, p. 140-145, 1956.
3. Molluscan faunas of the Flagstaff Formation of central Utah: Geol. Soc. America Mem. 78, 100 p., 1960.

LAUTENSCHLAGER, H. KENNETH
The geology of the central part of the Pavant Range, Utah: Ohio State Univ. Ph.D. dissertation, 1952.

LEE, KWANG-YUAN
1. Petrography of the Price River Formation in the Sanpete Valley district, Utah: Ohio State Univ. M.S. thesis, 1950.
2. A petrographic study of the latest Cretaceous and earliest Tertiary formations of central Utah: Ohio State Univ. Ph.D. dissertation, 1953.

MASE, RUSSELL E.
The geology of the Indianola embayment, Sanpete and Utah Counties, Utah: Ohio State Univ. M.S. thesis 1957.

MARCANTEL, EMILY L.
(and Weiss, Malcolm P.) Colton Formation (Eocene: fluviatile) and associated lacustrine beds, Gunnison Plateau, central Utah: Ohio Jour. Science, v. 68, no. 1, 1968.

McGOOKEY, DONALD P.
1. Geology of the northern portion of the Fish Lake Plateau, Utah: Ohio State Univ. Ph.D. dissertation, 1958.
2. Early Tertiary stratigraphy of part of central Utah: Am. Assoc. Petroleum Geologists Bull., v. 44, no. 5, p. 589-615, 1960.

METTER, RAYMOND E.
The geology of a part of the southern Wasatch Mountains, Utah: Ohio State Univ. Ph.D. dissertation, 1955.

MUESSIG, SIEGFRIED J.
1. Geology of a part of Long Ridge, Utah: Ohio State Univ. Ph.D. dissertation, 1951.
2. Eocene volcanism in central Utah: Science, v. 114, no. 2957, p. 234, Aug. 31, 1951.
3. See Hardy, Clyde T. —4.

NIKRAVESH, RASHEL
Microfauna of the type Allen Valley Shale (Upper Cretaceous), Sanpete County, Utah: Ohio State Univ. M.S. thesis, 1963.

PASHLEY, E. FREDERICK, Jr.
The geology of the western slope of the Wasatch Plateau between Spring City and Fairview, Utah: Ohio State Univ. M.S. thesis, 1956.

ROY, EDWARD C.
Molluscan faunas of the Gunnison Reservoir deposit, Sanpete County, Utah: Sterkiana, no. 6, p. 5-13, 1962.

SCHOFF, STUART L.
1. Oolites in the Manti Formation of central Utah: Ohio State Univ. M.A. thesis, 1931.
2. Geology of the Cedar Hills, Utah: Ohio State Univ. Ph.D. dissertation, 1937.
3. Oolites in the Green River Formation of central Utah, and the problem of oolite growth: Indiana Acad. Sci. Proc. v. 46, p. 167-170, 1937.
4. Geology of the Cedar Hills, Utah: Geol. Soc. America Bull., v. 62, p. 619-646, 1951.

SPIEKER, EDMUND M.
1. (and Reeside, John B., Jr.) Cretaceous and Tertiary formations of the Wasatch Plateau, Utah (with discussion by Charles Schuchert): Geol. Soc. America Bull., v. 36, no. 3, p. 435-454, 1925.
2. Geology of the coal fields (of Utah): U. S. Bur. Mines, Tech. Paper 345, p. 13-22, 1925.
3. (and Reeside, John B., Jr.) Upper Cretaceous shoreline in Utah: Geol. Soc. America Bull., v. 37, no. 3, p. 429-438, 1926.
4. (and Baker, Arthur A.) Geology and coal resources of the Salina Canyon district, Sevier County, Utah: U. S. Geol. Survey Bull. 796, p. 125-170, 1928.
5. Bituminous sandstone near Vernal, Utah: U. S. Geol. Survey Bull. 822, p. 77-98, 1930.
6. The Wasatch Plateau coal field, Utah: U. S. Geol. Survey Bull. 819, 210 p., 1931.
7. The orogenic history of central Utah: Science, v. 83, no. 2142, p. 62-63, Jan. 17, 1936.
8. (and Billings, Marland P.) Glaciation in the Wasatch Plateau, Utah: Geol. Soc. America Bull., v. 51, no. 8, p. 1173-1197, 1940.
9. Late Mesozoic and early Cenozoic history of central Utah: U. S. Geol. Survey Prof. Paper 205-D, p. iii, 117-161, 1946.
10. The transition between the Colorado Plateau and the Great Basin in central Utah: Utah Geol. Soc. Guidebook no. 4, 106 p., 1949.
11. Sedimentary facies and associated diastrophism in the Upper Cretaceous of central and eastern Utah, *in* Longwell, C. R., chm., Sedimentary facies in geologic history (symposium): Geol. Soc. America Mem. 39, p. 55-81, 1949.
12. Mountain-building chronology and nature of geologic time scale: Am. Assoc. Petroleum Geologists Bull., v. 40, no. 8, p. 1769?-1815, 1951.

13. Structural history (central and south-central Utah): *in* Intermountain Assoc. Petroleum Geologists, 5th Ann. Field Conf., 1954, p. 9-14, 1954.
14. The Cretaceous-Tertiary boundary in Utah: Internat. Geol. Cong., 21st, Copenhagen, 1960, pt. 5, p. 14-24, 1960.

TAYLOR, DOROTHY ANN
The geology of the Gunnison Plateau front in the vicinity of Wales, Utah: Ohio State Univ. M.S. thesis, 1948.

THOMAS, GILBERT E.
The South Flat and related formations in the northern part of the Gunnison Plateau, Utah: Ohio State Univ. M.S. thesis, 1960.

TUCKER, LEROY M.
Geology of the Scipio quadrangle, Utah: Ohio State Univ. Ph.D. dissertation, 1954.

VOGEL, JAMES W.
The geology of southernmost Juab Valley and adjacent highlands, Juab County, Utah: Ohio State Univ. M. S. thesis, 1957.

WALLACE, RONALD G.
Late Cenozoic mass movement along part of the west edge of the Wasatch Plateau, Utah: Ohio State Univ. M.S. thesis, 1964.

WASHBURN, GEORGE R.
Geology of the Manti Canyon area, central Utah: Ohio State Univ. M.S. thesis, 1948.

WEISS, MALCOLM P.
1. Geologic map of Flagstaff and related formations: Utah Geol. and Mineralog. Survey, Salt Lake City, Utah, Open-file, scale 1:250,000, 1965.
2. X-radiography of rocks with I-125 source: Am. Assoc. Petroleum Geologists Bull., v. 50, no. 7, p. 1507-1510, 1966.

WILSON, MARK D.
Geology of the upper Six-Mile Canyon area, central Utah: Ohio State Univ. M.S. thesis, 1949.

YOUNG, ROBERT G.
1. Stratigraphic relations in the Upper Cretaceous of the Book Cliffs, Utah-Colorado: Ohio State Univ. Ph.D. dissertation, 1952.
2. Sedimentary facies and intertonguing in the Upper Cretaceous of the Book Cliffs, Utah-Colorado: Geol. Soc. America Bull., v. 66, no. 2, p. 177-201, 1955.
3. Late Cretaceous cyclic deposits, Book Cliffs, eastern Utah: Am. Assoc. Petroleum Geologists Bull., v. 41, no. 8, p. 1760-1774, 1957.

ZELLER, HOWARD D.
1. The geology of the west-central portion of the Gunnison Plateau, Utah: Ohio State Univ. M.S. thesis, 1949.
2. See Hardy, Clyde T. —5.

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Diggin's . . .

On May 22, David J. Leeds, Engineering Seismologist, Los Angeles, spoke on "Earthquake-Resistant Design Criteria in Protection of Population and Property in the State of Utah," at a meeting held at the U. of U.

Mr. Leeds, a representative of the firm of Danes and Moore, is a member of the Geologic Hazards Committee of the A. I. P. G., the Earthquake Research Institute, and is an advisor on seismic zoning for the International conference of Building Officials.

Mr. Leeds brought evidence from major earthquake occurrences around the world to bear on the Utah situation. He noted the need for strong motion seismographs is apparent in Utah, because of the state's relatively high seismicity. Characteristics of the motion of structures in the earthquake-prone areas may then be evaluated, he said.

Establishment of an *official* Governor's Committee on Geologic Hazards* perhaps is more important to the state. Such a committee would be comprised of structural engineers, geophysicists, geologists, urban planners, architects, seismologists,and soil engineers.

—B.N.K.

The *Quarterly Review* recently referred to Reprint 93 as Reprint 90. An apology is due those who have been inconvenienced by this error.

Reprint 93 (50¢), a paper by Andrew Edmunds Kurie reprinted from the Geological Society of America Bulletin, contains a map which covers the Colorado Plateau margin near Zion National Park. Site and section of an oil well being drilled by the Willard Pease Drilling Company are shown; section A-A′ passes in the vicinity of the well.

Mr. William L. Chenowith of the U. S. Atomic Energy Commission, Grand Junction, Colorado, has supplied the Utah Geological and Mineralogical Survey with uranium oxide (U_3O_8 and fluorine analyses of brine samples from the Great Salt Lake.

Averages for 12 samples from various depths down to 24.5 feet below the surface were: .32 parts per million U_3O_8 and 7 ppm F. More detailed information is available from the Utah Geological and Mineralogical Survey, 103 Utah Geological Survey Building, University of Utah, Salt Lake City, Utah.

*An unofficial committee has been active in Utah since April, 1967, under whose auspices this event was held.

The U. S. Geological Survey has announced it is releasing in open files three coal reports:

— Preliminary geologic map of the Canaan Creek quadrangle, 1:24,000, and coal sections (2 sheets).

— Preliminary geologic map of the Carcass Canyon quadrangle, Garfield and Kane Counties, Utah, by Howard D. Zeller. Map, scale 1:24,000, and coal sections (2 sheets).

— Preliminary geologic map of the Dave Canyon quadrangle, Garfield County, Utah, by Howard D. Zeller. Map, scale 1:24,000, and coal sections (2 sheets).

Copies are available for consultation in the U. S. Geological Survey Libraries: 1033 GSA Building, Washington, D. C. 20242; Building 25, Denver Federal Center, Denver, Colo. 80202, and 345 Middlefield Road, Menlo Park, Calif. 94025; and at the Geological Survey Public Inquires Office, Room 1012, Federal Building, Denver, Colo. 80202, and 8102 Federal Building, Salt Lake City, Utah 84111. Aepia copy that can be reproduced at private expense is available at the Denver and Salt Lake City Public Inquires Offices.

Harry Suekawa, research geologist, who recently received his masters degree in geology from the University of Utah, has left the Utah Geological Survey to join a private geologic consulting firm, Exploration Sciences Inc., 1355 Foothill Drive.

Mr. Suekawa came to the UGMS in 1965, and did summer field work on oil-impregnated sandstone in the P. R. Springs area. At the end of the season, he began on Great Salt Lake as research assistant to Dr. Robert E. Cohenour. He has devoted his research efforts to the lake since that time.

The Survey wishes Mr. Suekawa great success in his new endeavor.

At a recent meeting, the Board on Geographic Names approved for Federal use the name Pony Express Canyon in Utah, proposed by Kenneth C. Thomson, UGMS geologist.

This decision will be in Decision List 6801 and will read as follows:

Pony Express Canyon: pass, 2.5 mi. long, extends W from Clifton Flat to the valley of Deep Creek; separates Ochre Mountain on the N from the Deep Creek Mountains in the S; Tooele Co., Utah; 40°06′00″ N, 113°52′40″ W (E end), 40°06′00″ N, 113°55′30″ W (W end).

BLAST STUDIED

by BRUCE KALISER,
Utah Geological Survey, and
ROBERT B. SMITH,
Department of Geophysics

In its continual study of geologic hazards in Utah, the Engineering Geology Division of the Utah Survey is working in cooperation with the U. of U.'s Department of Geophysics.

It is our desire to learn more about the relationship that the substrate has to potential danger to structures, especially in the Salt Lake Valley and along the Wasatch Front areas.

The 1.2 megaton explosion of April 26, as yet, America's largest underground thermonuclear test, offered an opportunity to monitor its effects and to acquire much-needed data. The blast — equivalent to an earthquake of magnitude 6.4 on the Richter scale — was felt throughout Nevada and parts of adjacent states.

Salt Lake Valley received a significant 10-minute burst of seismic energy that resulted in at least 15 reports of vibrations and motions associated with the blast.

Measured ground accelerations ranged from approximately 0.0005 to 0.007 g's (1 g = normal value of earth's gravity). These accelerations are thought to be anomalously high, considering the distance from the source of energy.

Accelerations and vibratory sensations recorded for the relatively thick deposits of weak unconsolidated basin sediments also were unnaturally large. Because it is a body of relatively low rigidity, the basin's reaction to the seismic disturbance may be likened to that of a shaking bowl of gelatin with a resultant increase in seismic motion.

The region of maximum potential geologic hazard probably would coincide with this area.

Hopefully, future observations and research will provide information on which sound engineering and geologic practices may be based.

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 Survey ..... ***William P. Hewitt, Director***

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