Oklahoma Geology Notes

OKLAHOMA GEOLOGICAL SURVEY / VOL. 45, NO. 6 — DECEMBER 1985

On the Cover —

Well 24–2 OU Now Producing

Holden Energy Corporation's 24–2 OU, the drilling rig featured on the cover of the June 1985 issue of *Oklahoma Geology Notes,* was completed in October as a deeper-pool discovery and extension of the Corn District field in Cleveland County. The well, located on the north campus of the University of Oklahoma at sec. 24, T9N, R3W, is producing 39-API-gravity oil from the Arbuckle Group at a depth of 10,005–10,014 ft. Other oil wells in the area produce from much shallower formations of the Pennsylvanian.

Initial potential for Holden Energy's well was 90 barrels of oil and 100 Mcf of gas with 60 barrels of water per day. Total depth was 10,015 ft. The well is less than half of a mile south of a 1983 Holden Energy workover success that, in a 24-hour period, yielded 28 barrels of oil, 100 Mcf of gas, and 87 barrels of water from Pennsylvanian Unconformity at a depth of 7,912–7,926 ft. The well had been completed originally as a dry hole in 1977 by Hunton Oil and Gas.

Margaret R. Burchfield

Cover photo by Connie Smith

Oklahoma Geology Notes

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Oklahoma Geology Notes, ISSN 0030-1736, is published bimonthly by the Oklahoma Geological Survey. It contains short technical articles, mineral-industry and petroleum news and statistics, reviews, and announcements of general pertinence to Oklahoma geology. Single copies, $1.50; yearly subscription, $6. All subscription orders should be sent to the Survey at 830 Van Vleet Oval, Room 163, Norman, Oklahoma 73019.

Short articles on aspects of Oklahoma geology are welcome from contributors. A set of guidelines will be forwarded on request.

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Contents

This publication, printed by the Transcript Press, Norman, Oklahoma, is issued by the Oklahoma Geological Survey as authorized by Title 70, Oklahoma Statutes 1981, Section 3310, and Title 74, Oklahoma Statutes 1981, Section 231–238, 1,800 copies have been prepared for distribution at a cost of $1,239 to the taxpayers of the State of Oklahoma. Copies have been deposited with the Publications Clearinghouse of the Oklahoma Department of Libraries.

SURVEY COMPILES DATABASES ON STATE'S OIL, GAS, AND COAL RESOURCES

Michelle J. Summers[1]

The Oklahoma Geological Survey has designed and developed a computerized database of oil and gas fields in the State. Information contained in the computerized database includes field name, field code, year the field was named, county name, county code, section, township, range, former name or consolidated history, product code (oil, natural gas, and associated gas), monthly production, county production, producing-formation names, and remarks. At this time, monthly production figures covering the time from January 1980 through September 1985 are available for immediate retrieval through an online system.

OGS is currently compiling data on the oil- and gas-field file to evaluate the current producing-formation name and produce a complete description of the consolidated history of a field. Discovery-well information for each field will also be added to this file.

Another OGS database that has been developed is the well-history file. This file was designed and developed for the study of the Ouachita Mountains of Oklahoma and Arkansas. It is a cooperative agreement entered into by the U.S. Geological Survey, the Arkansas Geological Commission, and the Oklahoma Geological Survey. Types of information that have been added are county, county code, well location, operator, lease name, well number, date of first production, completion date, elevation, character of well, plugging date, producing formations, perforated intervals, casing-cement-mudding data, initial-production test, drill-stem test, samples, cores, logs, API gravity, API code, and comments. Only certain specified geographical areas of Oklahoma will be included in this file.

Another computerized program that has been developed is the field outline file, whereby the location (township, range, and section) are fed into a FORTRAN program that produces points to be used by SAS/GRAPH. This program takes into account the township, range, and section offsets to produce plotting patterns for each field. The program also outlines each field with points that are used for reference on the map. Points and the designated outline are then read by a SAS/GRAPH program that produces the map of the county using PROC GMAP. This

[1]Geologic data coordinator, Oklahoma Geological Survey, Norman.

database is being used by the Nomenclature Committee of the Oklahoma–Kansas Division of the Mid-Continent Oil and Gas Association, enabling the committee to refine field boundaries within Oklahoma.

The information maintained in the computerized databases has been acquired from the Oklahoma Tax Commission, Gross Production Division, the Nomenclature Committee of the Oklahoma–Kansas Division of the Mid-Continent Oil and Gas Association, and the Oklahoma Corporation Commission.

Oklahoma is also rich in coal. The State has 24 bituminous coal beds that cover 1.5 million acres in 19 counties in the northeastern part of the State.

The Oklahoma Geological Survey also has entered into a cooperative agreement with the U.S. Geological Survey to computerize coal data as part of the National Coal Resources Data System. Ongoing investigations by the OGS include coal-bed mapping, stratigraphic studies, calculations of resources and reserves, and chemical analyses that include trace and minor elements. The file contains information on location, stratigraphic, analytical, and petrographic data.

The Oklahoma Geological Survey plays a major role in furnishing needed information on Oklahoma's natural resources for public and the private sector. It is our goal to increase and refine the data that are publicly available. Because of the increasing amounts of information available, the job of designing, developing, and maintaining usable computerized data is a challenging task that is increasingly important to the State.

DESIGN AND DEVELOPMENT OF THE OGS FIELD-FILE

James C. Davis[1]

Introduction

In the autumn of 1982, the Oklahoma Geological Survey began work on a project to combine geological field data from the Nomenclature Committee of the Oklahoma–Kansas Division of the Mid-Continent Oil and Gas Association and lease/production data from the Oklahoma Tax Commission (OTC) and develop an online system to make the combined information available through the OGS.

Although the data elements necessary to correlate production to the field level were available prior to this, they were not available in an integrated form within a single agency.

This article will discuss the evolution of the field-file system from the initial data-verification stages in 1982–83 through the various system-design stages to the current iterative fine-tuning processes.

Data Sources

The field descriptions from the Nomenclature Committee contain field name, date of discovery, county names, and—most importantly for correlation purposes—the sections, townships, and ranges contained in the field. The OGS provided a file containing field numbers and field names. Data from the OTC included monthly production totals by lease number and a unit master-file containing lease number correlated to section and township-range.

By using intersecting data between the unit master and the production detail (the lease number), and between the unit-master file and the field file (the township-range and section), an indirect relationship between the production data and the field file was constructed.

[1]Systems Specialist, Oklahoma Geological Survey, Norman.

Data Verification

Prior to the establishment of an online information system, it was required that the data being fed into the system be tested for their validity and correctness. For the field-file project, the actual sources had to be loaded onto the data-center storage subsystem and then printed for visual inspection.

The first programming for the project was in the IBM Time Sharing Option (TSO) Command list (CLIST) interpretive language. CLIST's were written to enter the Nomenclature Committee data onto a disk file through a key-to-disk process. The field-file data were entered, printed, then edited for errors, and the production data and unit master-file from the OTC were printed for format verification.

During this early stage of the project, it became clear that the billing algorithm of University Computing Services (UCS) at the University of Oklahoma would be a large factor in the design choices made during the project.

Ease of use and minimum consumption of data-center resources were primary objectives of the project. Therefore, the balance of the data-verification programming was written in the IBM System 370 assembly language. The file format used was variable-length records, and the processing methodology was sort, match, and merge. These choices were a throwback to second-generation programming techniques, but the pronounced expense of the available operating environment dictated the decision.

During the programming/design stage of the field file in the winter of 1982–83, the OTC changed the format of the production-data file. Although this type of input format change is not uncommon, it does cause delays. (It should be pointed out that the programming/design for the project was done on a part-time basis of approximately six to 10 hours per week or less.) After the program adjustments were made, the data were loaded for verification.

After repeated failures during comparison of OTC totals and OGS totals, meetings with data processing personnel from the OTC were scheduled. During these meetings it was learned that check-sum records (not real-data records) existed in the delivered file. After these were thrown out, the field-file data and the OTC began to show excellent correlation. The comprehensive edit checks contained in OGS programs provided the OTC with feedback for detailed corrections to their files.

Printed reports at both county and field level became available during data verification, and the data provided were used to better delineate fields within Oklahoma. The availability of these data expedited this task of the Nomenclature Committee.

Online Development

One of the original objectives of the field-file project was to have an online system with lease-, field-, and county-production data available from a computer terminal.

The most common implementation of this online capability involves the use of a commercially available teleprocessing (TP) monitor such as IBM's Customer Information Control System (CICS) or Information Management System data communications (IMS/DC) system. IMS/DC was not available on the UCS system and CICS, though available, was limited to administrative use.

The field-file project was forced into a user-written interactive system within the TSO system at UCS. This added the burden of designing data presentation/placement to the normal programming tasks. Throughout the spring/summer of 1984, file designs were tried and cast aside. It was necessary that the files of the online system meet certain requirements: they must be processable by higher level extraction languages such as SAS, they must provide direct access to discrete data elements, and they must be as efficient as possible.

The solution, arrived at in late 1984, was the creation of direct keyed-files of the following types:

1. Production-data file keyed by lease number.
2. Field file keyed by field name or field number and containing section, township-range information.
3. A cross-reference file containing lease number as a key and section, township-range.
4. A cross-reference file containing section, township-range as a key and lease number.

With these four files, one could retrieve field-level totals by using the section, township-range in the field file to extract lease keys from the cross reference and retrieve the production records. One could also use the lease file to get production data at lease level. The cross-reference files are processable for section and lease correlations.

Some programs have been written in the PL/I computer language to provide direct online-output of data by selection criteria such as county name, lease number, and field name.

Current Developments

Data loading and system enhancement have dominated 1985. Massive amounts of detail data are still to be loaded, and requests for different types of information have been submitted. The lease data are being used within OGS. The field file has provided the elements necessary to feed

digital mapping programs for field delineation, and specific areas of the state now are being targeted for further detailed investigation.

Potential performance-improvements have been identified for the field-file project but will be difficult to implement without disturbing the current operating environment.

Summation

The Oklahoma field-file project has gone through the normal phases of data-processing development: data verification, design, and load, and is still in the iterative tuning phase. In the absence of a commercially available TP monitor, the system should be limited only by the speed with which extraction processes can be designed and written.

GEOREF COVERS 200 YEARS OF NORTH AMERICAN GEOLOGY

Earth scientists and information specialists searching the GeoRef (Geological References) database on DIALOG or CAN/OLE can now access North American geological references from 1785 to the present, GeoRef Director John Mulvihill has announced. The addition of 40,322 references from the *Bibliography and Index of North American Geology* (1785–1918) increases the size of the database to more than a million citations and greatly simplifies the task of researchers seeking early geological literature.

References from 1785 to 1960 are currently searchable only on DIALOG and CAN/OLE. System Development Corporation (SDC) plans to reload the database later this year and make the pre-1961 citations available at that time. In the process of adding the final segment of the North American backfile, DIALOG has also removed duplicate references that were introduced when overlapping bibliographies were added to the database. SDC will remove duplicates as well when they reload GeoRef.

The early references include the works of Hayden, Wheeler, Gilbert, Powell, and many other earth scientists who contributed to the original descriptions and interpretations of North American geology. Many of the newly added citations will also delight history-of-geology buffs. For example, Thomas Jefferson's memoir on certain Virginia fossils from 1799 is cited as are the original journals of the 1802 Lewis and Clark expedition.

The most recent addition is part of an ongoing effort to incorporate early major bibliographies in the database. GeoRef's international coverage runs from 1967 to the present, and work is already underway to add the *Bibliography and Index of Geology Exclusive of North America* (1933–1966). The backfile project is funded jointly by the American Geological Institute and the U.S. Geological Survey.

Jock A. Campbell

CAMPBELL JOINS OGS STAFF

Jock A. Campbell, a petroleum geologist, has recently joined the staff of the Oklahoma Geological Survey. Campbell, who has a strong background in industry, research, and academia, is currently working on several projects, including the computerized data-retrieval system for Oklahoma oil-field information, studies of subsurface industrial-waste disposal, research in potential for enhanced oil-recovery in Oklahoma, and investigations in petroleum geology of the Ouachita region.

Campbell has worked for Shell Oil Co. and for the Utah Geological and Mineral Survey and has done geological consulting work in parts of the southwestern United States. He also served as an associate professor of geology at West Texas State University in Canyon, Texas, where he was also a member of the Killgore Research Center, and at McNeese State University in Lake Charles, Louisiana.

"Jock brings a lot of valuable industrial and research experience to the Survey's already-strong petroleum program," said Kenneth S. Johnson, OGS associate director.

As a petroleum geologist with Shell, Campbell conducted regional studies in the western interior of the United States. He also investigated both carbonate and siliciclastic-dominated sedimentary basins to identify stratigraphic and structural traps. He gained broad experience in development of prospects, in surface and subsurface mapping, and in well-site geology.

While with the Utah Survey, Campbell's research included the identification of partially exposed oil-impregnated sandstone ("tar sand") deposits and the study of their reservoir properties. He also researched petroleum origin, migration, and entrapment in two petroleum-bearing sedimentary basins in Utah.

Campbell's geological consulting work, primarily in petroleum geology, also included assignments in hydrogeology and economic geology. In addition,

Campbell conducted office and field seminars for petroleum and mining companies operating in the southwestern United States.

At West Texas State University, he taught graduate and undergraduate courses in petroleum geology, plus structural geology and tectonics. Later, at McNeese State University, he added field methods and geophysical exploration to his teaching repertoire. He was involved in research activities at both schools.

Campbell holds a Ph.D. in geology (1978) from the University of Utah, and M.S. and B.S. degrees in geology from the University of New Mexico. He has authored numerous scientific papers dealing with petroleum geology, structural geology, stratigraphy, and geomorphology.

"I'm proud to be a member of the OGS staff," Campbell said, "and I look forward to contributing to the understanding of Oklahoma geology, especially as it relates to petroleum origin, migration, and entrapment."

NEW THESES ADDED TO OU GEOLOGY LIBRARY

The following M.S. theses have been added to the University of Oklahoma Geology and Geophysics Library:

Quartz and Feldspar Types: Key Indicators of Provenance and Diagenesis in the Hennessey Shale, Southwestern Oklahoma, by Thomas Allen Butler. 119 p., 54 figs., 1 table, 1985.

A Thermal and Mechanical Model for Subsidence and Changes in Lithospheric Thickness in the Michigan Basin, by Panayes John Dikeou. 68 p., 17 figs., 4 tables, appendix, 1985.

Increase in Lithospheric Thickness During the Subsidence of the Williston Basin, by Richard C. Ditmars. 47 p., 9 figs., 2 tables, appendix, 1985.

Seismic Investigation Near Silver Island in the Great Salt Lake Desert, Utah, by Jeffrey L. Fitter. 75 p., 27 figs., 2 tables, appendix, 1985.

The Silica Budget of a Modern Tropical Lagoon, Discovery Bay, Jamaica, by Leslie Lee Herd. 79 p., 16 figs., 3 tables, 8 appendixes, 1985.

Tectonics, Sedimentation, and Hydrocarbon Potential of the Reelfoot Aulacogen, by James Robert Howe. 109 p., 26 figs., 1 table, 1985.

A Geochemical Analysis of the Carbon System in a Modern Tropical Lagoon: Discovery Bay, Jamaica, by Jefferson Edwin Laughlin. 128 p., 43 figs., 5 tables, 3 appendixes, 1985.

A Laboratory Study of the Effects of Shear Stress on Fracture Permeability, by Jeffrey Parrish Linscott. 82 p., 21 figs., 3 tables, 2 appendixes, 1985.

The Lithostratigraphy, Carbonate Petrography, and Depositional History of the Marble Falls Formation (Pennsylvanian) in the Subsurface of Brown and Mills Counties, Central Texas, by Richard Stephen Luker. 193 p., 30 figs., 15 pls., 2 appendixes, 1985.

Paleomagnetism and Diagenesis of the Upper Cambrian Peerless Formation, Central Colorado, by Craig Jonathan Peck. 58 p., 11 figs., 2 tables, 1985.

SEPM ANNOUNCES MEETINGS

The Society of Economic Paleontologists and Mineralogists (SEPM) has announced a number of meetings that are scheduled for 1986. Among these meetings are:

April 7–9, 1986—SEPM Short Course "Platform Margin and Deep Water Carbonates," Calgary, Alberta.

May 8–9, 1986—SEPM Short Course "Relationship of Organic Matter and Mineral Diagenesis," Houston, Texas.

May 11–14, 1986—SEPM Field Seminar "The Description and Depositional Analysis of Marine Carbonates—A Field Techniques Workshop," Little Rock, Arkansas.

May 30, 1986—SEPM Short Course "Glacial Sedimentary Environments," Champaign, Illinois.

June 14–15, 1986—SEPM Short Course "Structures and Sequences in Clastic Rocks," Atlanta, Georgia.

June 14–15, 1986—SEPM Short Course "Modern and Ancient Deep Sea Fan Sedimentation," Atlanta, Georgia.

June 15, 1986—SEPM Short Course "Paleoclimatology and Economic Geology," Atlanta, Georgia.

June 15, 1986—SEPM Core Workshop "Modern and Ancient Shelf Clastics," Atlanta, Georgia.

August 1–2, 1986—SEPM Field Seminar "Paleozoic and Mesozoic Rocks of the Golden–Boulder Area and Denver Basin, Colorado," Golden, Colorado.

September 14–18, 1986—SEPM Field Seminar "Modern and Ancient Eolian Deposits," Alamosa, Colorado.

September 23–25, 1986—SEPM Short Course "Platform Margin and Deep Water Carbonates," Raleigh, North Carolina.

September 24–25, 1986—SEPM Short Course "Modern and Ancient Deep Sea Fan Sedimentation," Raleigh, North Carolina.

October 20–21, 1986—SEPM Short Course "Recognition of Fluvial Depositional Systems and Their Resource Potential," Baton Rouge, Louisiana.

November 1, 1986—SEPM Short Course "Exploration Concepts in Carbonate Rocks," Houston, Texas.

November 6–7, 1986—SEPM Short Course "Modern and Ancient Deep Sea Fan Sedimentation," Houston, Texas.

For further information about any of these sessions, contact Joni C. Merkel, Society of Economic Paleontologists and Mineralogists, P. O. Box 4756, Tulsa, OK 74159-0756. The telephone number is (918) 743-2498.

A Review

LAND PRINTS

Land Prints, by Walter Sullivan, 1984. 384 pages. Published by Times Books, New York. $22.50.

Elizabeth A. Ham[1]

"To those who rejoice in the world below, above, and around us, who see 'sermons in stones,' and who are inspired by the sweep of our panoramas and their history."

So reads the dedication to Walter Sullivan's latest book, *Land Prints*.

The titles of individual chapters are equally lyrical: "The Greatest Show on Earth," "A Cavalcade of Continents," "Meanders — Masterpieces of Flowing Water," "The Age of the Winds," "Marching and Soaring Landscapes—the Northern Rockies."

Land Prints is more, however, than a reduction of geomorphology, land forms, earth processes to poetry. It is a remarkable book, a history of a continent, at least of our part of a continent, plus those islands out there in the Pacific that are part of the U.S. —a history in microcosm, true, but nonetheless comprehensive. And it is an absorbing history. There is much here to catch and hold the interest of the reader, geologist or not.

Geologist or not, have you ever looked from an airplane window and wondered about what you saw way down there and how it got to be as it is? Traveled a road in a car, a bus, a train, and marveled? Look at *Land Prints*.

A mountain range, ice-sculptured or not? Glacier-scoured, glacier-dammed lakes, glacial deposits? Volcanic cones, volcanic or meteor craters? River meanders, incised or otherwise, river deposits? Wind carvings, wind deposits in miraculous shapes? Seas' shores in their variety? Mines, pits, excavations? Curved-contoured or geometrically cornered plowed or planted fields in futuristic designs that look like abstract paintings? They are all in the book, as are several cities, each with its own intriguing design.

And look up (or down) there in the sky. An anvil cloud forming, cumulus masses becoming a storm, a rotating hurricane — how did they come to be? Have you ever seen a "glory," a prismed halo on a cloud?

Walter Sullivan explains simply, succinctly, and without downtalking how all these things and others came to be. He includes some pertinent

[1]Associate editor, Oklahoma Geological Survey, Norman.

historical, sociological, and economic notes, some discussion of land usage, something of the effects of man's occupation of the land.

It becomes obvious that, in addition to borrowing from some already published works, the author has crossed and recrossed our country from various directions in preparing this work. There is a double-page relief map of the United States toward the end of the book, with air routes superimposed. There are several pages of itineraries to close the text. He has also traversed a lot of literature and many collections to assemble some wonderful photographs and other illustrations to accompany the text. He has even included our own Kenneth S. Johnson's classic aerial photo of land reclamation in Oklahoma's strip-mined coal fields.

The book is well designed, the print is easy to read, and I found none of the printing errors that like to creep in.

I can find nothing adverse to say about this book, except that our copy separated from the spine in spite of careful handling. I would wish that the Arbuckle Mountains and the Wichitas could have been included, as were the Ouachitas, but you can't have everything.

Walter Sullivan, the science editor of the New York Times, is one of several fine writers who are doing a great service in bringing science to the citizen, making it interesting without being demeaning to either scientist or layperson. Year before last he received the award of the year from the Association of Earth Science Editors. It was well deserved.

Read the book—*Land Prints on the Magnificent American Landscape.*

NOTES ON NEW PUBLICATIONS

Brines and Evaporites

Contents of this 624-page reference by Peter Sonnenfeld include formation of brine, primary precipitation, admixtures to precipitates, postdepositional alterations, morphology of evaporite deposits, and mineralogical data.

Order from: Academic Press, Inc., Attn: Promotion Dept., 6277 Sea Harbor Dr., Orlando, FL 32821. The price is $75.

Eruptions of Mount St. Helens; Past, Present, and Future

R. I. Tilling presents highlights of the Mount St. Helens volcano's past and present eruptive activity and speculates about its possible future behavior in this 52-page publication.

Order from: U.S. Geological Survey, Western Distribution Branch, Box 25286, Federal Center, Denver, CO 80225. Single copies of the book are free.

Geologic Map of Wyoming

Compiled by J. D. Love and A. C. Christiansen, this map is the first to show the subdivisions (23 units) of Precambrian rocks in Wyoming. The map locates kimberlite pipes and intrusives in diatremes, a subsurface impact structure, and subsurface thrust faults that are based on new seismic and drill-hole data. The three-sheet map is printed at a scale of 1:500,000 (1 in. = about 8 mi). The map indicates correlation and ages of map units by areas, and the explanation contains 232 stratigraphic units. More than 450 references to sources of geologic data are listed. About 90% of this map is compiled from post-1955 geologic mapping.

Order from: U.S. Geological Survey, Western Distribution Branch, Box 25286, Federal Center, Denver, CO 80225. The price is $7.30 per set. A $1 postage and handling charge is applicable on orders of less than $10.

National Water Summary, 1984; Hydrologic Events, Selected Water-Quality Trends, and Ground-Water Resources

This USGS water-supply paper contains an overview of the occurrence, distribution, and use of ground water in each of the states and the territories and reviews significant hydrologic events of the 1984 water year. The articles describe the occurrence of nitrate in ground water, ground-water declines in different hydrogeologic environments, and the distribution and trends of several water-quality constituents in major rivers. The state summary for Oklahoma was prepared by J. S. Havens and M. V. Marcher and includes a section on ground-water management by J. W. Schuelein. The 467-page, multicolor report is the second of an annual series.

Order W 2275 from: U.S. Geological Survey, Eastern Distribution Branch, Text Products Section, 604 S. Pickett St., Alexandria, VA 22304. The price is $29, postpaid; add 25% to the price for foreign shipment.

Mapping of Brine Contamination in Osage County, Oklahoma, Using Transient Electromagnetic Soundings

D. V. Fitterman is the author of this 58-page USGS open-file report.

Order OF 85–0210 from: U.S. Geological Survey, Western Distribution Branch, Open-File Services Section, Box 25425, Federal Center, Denver, CO 80225. The price is $4 for microfiche and $9 for a paper copy; add 25% to the price for foreign shipment.

Effects of Brine on the Chemical Quality of Water in Parts of Creek, Lincoln, Okfuskee, Payne, Pottawatomie, and Seminole Counties, Oklahoma

R. B. Morton is the author of this USGS open-file report, which contains 103 pages and one oversized sheet at a scale of 1:125,000 (1 in. = about 2 mi). The report may be inspected at the Oklahoma Geological Survey, 830 Van Vleet Oval, Norman, OK 73019; and at the U.S. Geological Survey,

Water Resources Division, 215 Dean A. McGee Ave., Room 621, Oklahoma City, OK 73102.

Order OF 84–0445 from: U.S. Geological Survey, Western Distribution Branch, Open-File Services Section, Box 25425, Federal Center, Denver, CO 80225. The price is $10.75 for microfiche and $22.25 for a paper copy; add 25% to the price for shipment outside the U.S.A. (except Canada and Mexico).

Ground-Water Levels in Observation Wells in Oklahoma, 1983–84 Climatic Year

Written by R. L. Goemaat, L. D. Mize, and D. E. Spiser, this 580-page USGS open-file report is available for reference at the U.S. Geological Survey, Water Resources Division, 215 Dean A. McGee Ave., Room 621, Oklahoma City, OK 73102.

Order OF 85–0087 from: U.S. Geological Survey, Western Distribution Branch, Open-File Services Section, Box 25425, Federal Center, Denver, CO 80225. The price is $4 for microfiche and $89.75 for a paper copy; add 25% to the price for foreign shipment.

Annual Yield and Selected Hydrologic Data for the Arkansas River Basin Compact, Arkansas–Oklahoma, 1984 Water Year

M. A. Moore and T. E. Lamb are the authors of this 32-page USGS open-file report.

Order OF 85–0179 from: U.S. Geological Survey, Western Distribution Branch, Open-File Services Section, Box 25425, Federal Center, Denver, CO 80225. The price is $4 for microfiche and $5.25 for a paper copy, postpaid; add 25% to the price for shipment outside the U.S.A. (except Canada and Mexico).

Manual of Carbonate Sedimentology

An overview of the field of carbonate sedimentology with an emphasis on trends of porosity development is presented by T. J. A. Reijers and K. J. Hsü. The 358-page reference is intended for workers in the industry as well as for students in petroleum geology. It contains a list of approximately five-hundred keywords with their definitions and translation into Dutch, German, Spanish, and French. Widely used informal abbreviations are also given.

Order from: Academic Press, Inc., Attn: Promotion Dept., 6277 Sea Harbor Dr., Orlando, FL 32821.

Earthquake Prediction

Based on the results of various field observations and laboratory experiments, this book discusses what features should be focused on when carrying out earthquake prediction. Kiyoo Mogi explains, from the

viewpoint of physics, how earthquake prediction depends on the extent to which precursory phenomena appear and how these phenomena depend on such factors as the heterogeneity of the earth's crust. The 376-page book includes an explanation of the current state of earthquake prediction methods and covers the establishment of a practical system for predicting earthquakes through a 24-hour-a-day system of constant monitoring. Numerous examples are cited from Japan, where geophysical data have long been kept.

Order from: Academic Press, Inc., Attn: Promotion Dept., 6277 Sea Harbor Dr., Orlando, FL 32821. The price is $58.

Troubled Waters: Financing Water in the West

While demand for water across the country is increasing, federal funds for water projects are drying up. This 214-page publication shows how the challenge to preserve and improve the nation's water systems can be met. Author Rodney T. Smith sets out a collection of policies designed to finance water projects at the lowest possible cost. While the book focuses on the western region, it shows how states can initiate reforms that can help build state collateral for financing water needs.

Order from: Council of State Planning Agencies, Publications Dept., 400 North Capitol St., Room 291, Washington, DC 20001. The price is $17.95 plus $2.50 for postage and handling.

Inventory of Filmed Historical Seismograms and Station Bulletins at World Data Center A

The Historical Seismogram Filming Project, begun in 1979 by World Data Center A for Solid Earth Geophysics and by the National Geophysical Data Center, and the Seismograph Station Bulletin Filming Project, carried out by St. Louis University researchers, are described in this 220-page report. These two projects were undertaken to preserve seismograms and station bulletins, which are becoming increasingly important for assessing earthquake risk and hazards, determining seismicity, and conducting earthquake prediction programs or other studies where data covering long periods of time are needed.

Part I of this publication, compiled by Dale P. Glover, H. Meyers, R. B. Herrmann, and M. Whittington, describes the Seismograph Station Bulletins Project, in which pages from 450 seismograph stations in more than 200 countries were filmed. A country/station index provides access to the bulletins included in the data collection. Part II describes the Historical Seismogram Filming Project, which includes more than one-half million seismograms (pre-1963).

Order Report SE-37 from: National Geophysical Data Center, NOAA, Code E/GCx2, 325 Broadway, Boulder, CO 80303.

Advances in Petroleum Geochemistry, Volume 1

Aspects of petroleum geochemistry will be covered in this new series. Contents of Volume I, edited by J. Brooks and D. H. Welte, include thermal models for oil generation, models used in petroleum resource estimation and petroleum geochemistry, applications of biological markers in petroleum exploration, isotope studies in petroleum research, pyrolysis studies and petroleum exploration, and biodegradation of crude oils in reservoirs. Volume I contains 334 pages.

Order from: Academic Press, Inc., Attn: Promotion Dept., 6277 Sea Harbor Dr., Orlando, FL 32821. The price is $49.50.

Reservoir Characterization

Edited by Larry Lake and Herbert B. Carroll, this volume is based on a conference held in Dallas, Texas, April 29–May 1, 1985. The objectives of the conference included: reviewing current practices and procedures in the area of reservoir characterization, identifying problems and difficulties related to current practices, publicizing current research in all related areas, and identifying trends in this field for future conferences and workshops.

Order from: Academic Press, Inc., Attn: Promotion Dept., 6277 Sea Harbor Dr., Orlando, FL 32821.

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