

p. 2-3. P. B. King - ^{Structure} a look of W. North America -

PACIFIC PETROLEUM GEOLOGIST

NEWS LETTER OF THE PACIFIC SECTION
AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS

ASSOCIATION ACTIVITIES

Volume 15

January 1961

Number 1

PACIFIC SECTION INCORPORATION

Your Executive Committee recommends approval by the membership of our proposal to incorporate the Pacific Section, A.A.P.G. because, by incorporating, we reduce exposure of officers and members to personal liability involved in incurring of financial obligations.

Bill Edmund, the Sacramento Petroleum Association member on the Executive Committee, has rendered us a great assistance and financial saving by securing the voluntary services of Mr. Vernon Barrett, of the law firm Wellborn, Barrett and Rodi, in the drafting and processing of the papers connected with incorporation. Mr. Barrett advises the following: "The outstanding advantage of incorporating an organization of this type is to reduce the exposure of its members to personal liability, particularly those members who take action in behalf of the association which leads to the incurring of financial obligations. A corporation is an artificially created person who can own property and have duties and obligations in much the same manner as a natural person. When officers deal in behalf of a corporation, they can without much difficulty make it clear that the obligations they are incurring are those of the corporation and not their own. An unincorporated association is generally an unsatisfactory arrangement in terms of its rights and duties and its ownership of property and corresponding rights and duties of its members."

Prior to filing papers on incorporation, it is necessary that our membership approve this proposed move. In addition, certain minor constitutional changes are in order so that the printed matter fits currently recognized facts.

Please refer to your December, 1960 issue of P.P.G., page 2, and note the following proposed changes:

Article I. After the words "This organization" insert "whose area of interest comprises the Pacific coastal region"

Article III, Section 1. Delete "and residing in California, Oregon, or Washington."

Article IV, Section 2. Delete the word "and" after the words "San Joaquin Geological Society", substitute a comma for the period after the words "Coast Geological Society," and add the following, "and one member selected by the Sacramento Petroleum Association."

In connection with Article I and Article III, Section 1, above, the facts are that we do have a large membership residing outside of the three Pacific Coast states, and in connection with Article IV, Section 2, you will remember that we welcomed affiliation by the Sacramento Petroleum Association late last year.

Please vote yes on the ballot below, sign your name, and return to:

Robert O. Patterson, Secretary
Pacific-Oil Well Logging, Inc.
714 West Olympic Boulevard
Los Angeles 15, California

Ballot must be in hands of Secretary by January 25, 1961 to be counted!!

Ballot		(Put "X" in box below)	
	Yes	No	
1. Incorporation of Pacific Section of A.A.P.G.	<input type="checkbox"/>	<input type="checkbox"/>	
2. Amend Articles of Constitution as proposed above. (Note, that if you favor incorporation these changes should likewise be approved by a "yes" vote.)	<input type="checkbox"/>	<input type="checkbox"/>	
Signature - Active Member			

EXECUTIVE COMMITTEE, PACIFIC SECTION
AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS

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Andrew J. MacMillan	Vice-President
Robert O. Patterson	Secretary
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PACIFIC PETROLEUM GEOLOGIST

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Los Angeles Correspondent	
Northwest Correspondent	Malcolm B. Greene
Sacramento Correspondent	Lowell Garrison
San Francisco Correspondent	D. H. Pfeiffer
San Joaquin Correspondent	Ronald G. Heck

Next Deadline: January 27, 1961

SACRAMENTO GEOLOGICAL SOCIETY

On December 13, 1960 Philip B. King (USGS) spoke on the "Structural Evolution of Western North America" before members of the Sacramento Geological Society.

Abstract

Western North America is the region of the Cordilleran system of mountain ranges, which extend inland from the Pacific Coast 400 to 1,000 miles to the Great Plains of the continental interior. The landscape of the region has been shaped by surface processes of erosion, sedimentation, and volcanism, but ultimate cause of the features is deeper in the crust, in processes that have deformed the rocks, brought about emplacement of magmas, and raised or lowered

large sections of the surface. These processes, though spasmodic, are persistent through history. In considering the growth of a mountain system such as the Cordillera, they may be generalized into a geosynclinal phase, an orogenic phase, and a post-orogenic phase.

The geosynclinal phase was a time of sedimentation and rather mild crustal activity. In the Cordilleran region it persisted through Paleozoic time and through the first half of Mesozoic time.

The orogenic phase began earliest in the western part of the Cordillera, broadly in mid-Mesozoic time--in places in the Jurassic, elsewhere somewhat later. Rocks formed in this part of the geosyncline were deformed, metamorphosed, and invaded by large bodies of magma. The deformed rocks were raised into a land surface, from which detritus was shed westward into the Pacific Ocean basin, and eastward as a broad sheet into the interior of the continent, across the remainder of the geosyncline.

During Cretaceous time, deformation progressed eastward from the initial disturbed belt, folding and faulting the rocks of the Great Basin area, more lightly affecting those on the site of the Colorado Plateau, and more heavily affecting those in the Rocky Mountains beyond. In the southern part of the Rocky Mountains, zones of weakness had already been created by mountain-making during Paleozoic time. By the close of the orogenic phase, in Late Cretaceous and Paleocene times, deformation had reached the edge of the present Great Plains, but it progressed no farther inland.

The folding and faulting of the orogenic phase did not produce the modern topography. While the surface was raised and lowered by it, leveling processes of erosion and sedimentation were active and prevented development of strong relief; moreover, regional altitudes remained low.

Modern surface features evolved by a multitude of crustal processes during the post-orogenic phase, in Tertiary and Quaternary times. Intermontane basins subsided (as in Wyoming and Colorado), large areas were broken up by block faulting (as in the Great Basin), and other large areas were overspread by lava (as in the Columbia Plateau), and mountains were formed by the building of chains of volcanoes (as in the Cascade

Range). Besides, extensive regions were uplifted relative to their surroundings, with little internal deformation. The largest uplifted region centered in the Rocky Mountains and extended into the Great Plains and Colorado Plateau; it was raised mainly before later Tertiary time, but with diminishing uplifts into the Pleistocene. Smaller, more complex uplifts took place somewhat later in the Sierra Nevada and Cascade Range; in the Sierra Nevada, uplift was accompanied by marked faulting along the eastern side.

The post-orogenic (Tertiary and Quaternary) movements raised the Cordilleran region to its present generally high altitude. Streams quickened by the uplift and by increased rainfall during the Pleistocene, etched out the mountains and canyons; mountain barriers prevented free circulation of moisture-laden winds from the Pacific and heightened the climatic contrasts. Since mid-Tertiary time, regional relief, local relief, and climatic contrasts have been greater in the Cordillera than at any earlier period.

Throughout geologic time, the Cordilleran system has been bordered on the west by the deep Pacific Ocean basin, floored by crustal material different from that of the continent. It is unlikely that any additional lands ever existed offshore that have since foundered to oceanic depths. More likely, continental area has been added at the expense of ocean basin by various accretionary processes. On the other hand, land connections persisted intermittently along the strike of the Cordilleran system, between North America, Asia, and South America, as the coastal areas of all three are part of a circum-Pacific belt of mountain structures whose origin, like the North American Cordillera, extends far back into the geologic past.

NORTHERN CALIFORNIA GEOLOGICAL SOCIETY

The Northern California Geological Society has elected the following slate of officers for 1961:

President: William P. Winham
Standard Oil Co. of Calif.
Vice-President: Earl W. Hart
Calif. Div. of Mines.
Secretary-Treasurer: William K. Gealey
Calif. Exploration Co.

1962 NATIONAL MEETING

Technical Program Committee Chairman Graham Moody and Co-Chairman John Kilkenny, AAPG-SEPM Convention 1962, held an important meeting with General Convention Chairman Gordon Oakeshott recently to begin crystallization of the program for the 1962 Convention to be held in the San Francisco Civic Auditorium March 26 - 29 of that year. Members of the Committee are: Graham Moody, John Kilkenny, Ed Lammers, Antonie Paap, Art Huey, Bob Dyk, Dana Braislin, Vic King, William Barbat, Oliver Bowen, Herschel Driver, Bill Goth, Roger Alexander, Mason Hill, and John Hazzard. Tentative plans are for a research symposium and discussion Monday afternoon and evening, March 26, 1962, on automatic data processing and its application to geology. The following Tuesday morning, in conformance with tradition, will be devoted to the National President's program. Tuesday afternoon will offer a series of papers on the geologic setting for petroleum in California and selected papers on exploration for oil and gas in California, including

offshore geology and offshore developments. Wednesday morning will continue the convention theme of circum-Pacific petroleum exploration, with a wider group of circum-Pacific papers, including authoritative discussions on Alaska, Baja California, the Gulf of California area, and the western coast of South America. That afternoon the eastern hemisphere will be treated by a series of papers dealing with Japan, the Philippines, Indonesia, Papua, and New Guinea, and the latest developments in Australia. The Thursday morning program will be on the general oceanic area of the Pacific, including Pacific oceanography, submarine features, seismicity of the Pacific belt, deep sediments in the Pacific Ocean, and an up-to-date account of the Mohole project. Thursday afternoon will conclude the program with papers on world-wide developments outside the circum-Pacific theme. These will be on such areas as Africa, the Middle East, and Europe. The Committee is currently crystallizing these ideas into invitations to geologists and related scientists who are best prepared to make presentations of value. The ideas of the readers of PPG are invited.

IN MEMORIAM

Rebecca Woodward, daughter of Warren Woodward, Shell Oil Company geologist, was aboard the United Airlines plane that recently crashed over New York. Miss Woodward was returning to New York for the Christmas holidays.

HOLIDAY DINNER DANCE

The Holiday Dinner Dance, sponsored jointly by the Pacific Section, A.A.P.G., S.E.P.M. was held December 17, 1960, at the Oakmont Country Club. 224 persons enjoyed the dinner and dancing to the music of Ivan Scott and his orchestra, as well as the cocktail party preceding which was sponsored by donations from the following service companies:

Lane-Wells
Exploration Logging
Robert Ray
Schlumberger
Western Offshore
Cook Testing
Formation Logging
B. J. Service
United Geophysical
Western Geophysical
Munger Oilogram
Rapid Blueprint
Pacific Towboat
Geol. Exploration
Partain Exploration
Johnston Testers
Welex
Mojave Mud Company

The dance committee wishes to thank all the persons attending and the service companies for their help in making the dance a successful affair.

COAST GEOLOGICAL SOCIETY

An interesting and well-presented talk on "The Timber Canyon Field," was given by Spence Fine, Richfield Oil Corporation, Ojai, at the Pierpont Inn, Ventura, on December 13, 1960.

Located approximately 4 miles north of Santa Paula at an elevation of about 2600 feet, Timber Canyon Field is one of the more unique fields of the Ventura Basin. The producing sands

dip steeply northerly and are overturned, being part of the south flank of the Sulphur Mountain anticline. The sands also crop out updip from the producing wells and are oil-stained. There is a column of oil sand nearly a mile high, thus the reservoir is literally standing on end. The geology of the area is complex. A typical well may spud in Eocene, encounter the San Cayetano fault, where a Monterey fault sliver may be present, then drill in Pliocene of the north flank of the anticline before encountering the Sisar (?) fault, below which the "Santa Margarita" and producing basal Pico sands are overturned. About 500 bbls/day of 35 gravity oil is produced at the present time, and the principle mechanism of drainage may be gravity.

NORTHERN CALIFORNIA PETROLEUM ROUND TABLE

On Friday afternoon, December 23rd, the Northern California Petroleum Round Table held a cocktail party for members of the Sacramento industry at the Sacramento Inn. Thanks are extended to contributors to the 7th annual N. C. P. R. T. Barbecue held this summer at the Yolo Fliers' Club, Woodland. Their generous support financed both activities:

Blackwelder Iron Works
 Newton Drilling
 Borst and Giddens Well Loggers
 Johnston Testers
 Exploration Logging
 Santa Fe Drilling Co.
 Western Geophysical Co.
 Schlumberger Well Surveying Co.
 United Geophysical Co.
 Rental Tools Corp.
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 Asta Construction Co.
 John N. De Witt
 Brown Service Co.
 Guarantee Title Co.
 Hunnicut and Camp Drilling Co.
 Evers Drafting Service

COAST GEOLOGICAL SOCIETY

John Beall, who was elected Vice President of the Coast Geological Society in November, has found it necessary to resign because of a transfer to Los Angeles. The Coast Society has, therefore, elected a new officer, Charles F. Johnson.

President: Harry Whaley
 P. O. Box 811
 Ventura, Calif.

Vice President: Charles F. (Chuck)
 Johnson
 P.O. Box 670
 Santa Paula, Calif.

Secretary: Eugene C. (Gene)
 Johnson
 P.O. Box 691
 Ventura, Calif.

Treasurer: James J. (Jerry)
 Williams
 P.O. Box 3035
 Ventura, Calif.

LOS ANGELES LUNCHEON MEETING

Clarence Allen spoke before the Los Angeles Luncheon Meeting, December 1, 1960, on "Strike-Slip Faulting in Northern Chile." Pierre St. Amand, as senior author, worked jointly with Allen on the paper.

Abstract

Several right lateral strike-slip faults parallel the north-trending coastline throughout most of northern Chile. A conjugate left lateral set strikes east to northeast and is particularly evident north of Iquique. Here the system rotates so the dextral faults trend northwest parallel to the Peruvian coast. Evidence of Recent activity decreases markedly inland.

The major north-trending Atacama fault zone probably is more than 1000 km long. Discontinuous breaks delineate its southern end for 300 km south from Copiapo, but northward the El Salado segment is clearly continuous for 180 km through El Salado to Taltal airport, where it is offset by a northwest-trending sinistral fault. The probable offset equivalent extends 450 km north from Pajosa through Salar Remiendos and Salar Carmen to Salar Grande, where branches pass out to sea. Alluvial scarps testify to Recent activity along all segments of Atacama fault. Although the youngest displacements near Antofagasta have been predominantly vertical, an overall history of dextral strike slip is suggested by (1) linearity over hundreds of kilometers, (2) rift topography, with no consistent differential evaluation across the fault, (3) dextral stream offsets near Salar Grande, (4) Moletrack scarps, and (5) widespread horizontal slickensides. Rakes of slickensides averaged 29° in 52 mines throughout northern Chile along this and subsidiary faults.

The largest demonstrable Recent displacements are on northeast-trending faults: sinistral stream offsets average 0.4 km along Camarones fault 7 km southeast of the mouth of Rio Camarones, and a parallel fault 10 km east offsets Quebrada Chiza 1.5 km.

DIRECTORY AND CROSS SECTIONS

The new directory and cross sections are available from Harry Stuvelling, Jr., Pacific Log Exchange, 11515 East Washington Blvd., Whittier, Calif. Remittance in full must accompany orders: Directory: \$3.50 postpaid. Cross Sections: \$2.00 each postpaid.

No.	A.A.P.G. Sections
1	Sacramento Valley - South (2 sheets). North side of Sacramento Valley through Rio Vista, Thornton and Lodi Gas Fields, including Mt. Diablo-South Sacramento Correlation Chart.
2	Ventura Basin - East (1 sheet) Basement North of Oak Canyon Oil Field to Aliso Canyon Oil Field.
3	Los Angeles Basin (1 sheet) Palos Verdes Hills to San Gabriel Mountains.
4	Salinas Valley (1 sheet) San Antonio River northerly to San Andreas Fault, through San Ardo Oil Field.

- 6 Sacramento Valley - North (2 sheets)
A. From T-23N, R-1W through R-16N, R-1E; and
B. Correlation Chart.
- 7 Ventura Basin - Central (1 sheet)
From Santa Ynez Fault north of Ojai to Western Santa Monica Mountains, through Ventura Avenue and West Montalvo Oil Fields.
- 8 San Joaquin Valley - South (1 sheet)
From San Andreas Fault to Sierra Nevada Foothills, passing through Belgian Anticline, McKittrick, Elk Hills, Coles Levee, Fruitvale, Kern River and Round Mountain Fields.
- 9 Central San Joaquin Valley (1 sheet)
From San Andreas Fault to Sierra Nevada Foothills, passing through Coalinga, Guijarral Hills and Riverdale Fields.
- 10N Central San Joaquin Valley (1 sheet)
From Rio Vista to Riverdale through Rio Vista, McDonald Island, Tracy, Chowchilla, Gill Ranch, Raisin City, Helm and Riverdale Fields.
- 10S Central San Joaquin Valley (1 sheet)
From Riverdale to Tejon Ranch through Riverdale, Trico, Wasco, Rio Bravo, Greeley, Strand, Ten Section, Paloma, Wheeler Ridge, Grapevine and Tejon Ranch Fields.
- 11 West Side San Joaquin Valley (1 sheet)
From Coalinga to Midway-Sunset and across San Andreas Fault to southeast Cuyama Valley.
- 12 Santa Maria Basin (1 sheet)
From Lompoc to Nipomo Hills through Lompoc, Orcutt and Santa Maria Valley Fields.
- 13 Sacramento Valley - North-South (1 sheet)
From Redbluff to Rio Vista through Beehive Bend and River Island.

PERSONAL ITEMS

The Union Exploration Department Hawaiian Christmas party was held in Bakersfield just prior to the holidays. Secretaries Sharon Liefer and Betty Michele provided authentic hula entertainment.

Chuck Cary is the Union San Joaquin Valley 1960 Golf Champion with a low 12 month total. Ed Borglin is runner up and Joe Rossi placed 3rd.

Joe Johnson formerly with Shell in Bakersfield, Los Angeles, and Olympia has resigned and is home in Bakersfield. Future plans have not been announced.

John Castano, Shell, Bakersfield, after ordering a new Rambler with refrigeration quickly changed the order to an extra heater upon learning of his transfer to the Southern Alaska District. John and family are presently residing in Seattle.

As of the second week in January, 1961, the California Division of Mines and Geology will be located in new quarters in the New State Building: Room 1065, 107 South Broadway. Please note the change in Telephone, too. MADison 0-3560.

Exploration Logging threw a dance at the Del Norte Country Club, Thursday, December 18th. Some suggestions for the next time (?) --- Friday night instead of a week night.

Ernie Lian, Ohio, and wife have just recently sold their La Crescenta home and plan to move elsewhere after the first of the year. They are reportedly looking for a neighborhood full of children. This is difficult?

Humble Oil's Bill Smith is being transferred to Chico, California from the Los Angeles office.

Lauren Wright of the California Division of Mines made his annual journey to Shoshone to mail his Christmas cards, as evidenced by the postmark on the incoming mail.

Hal Fothergill, Union Oil, henceforth known as the "Durango Kid", took over Union's Durango District office January 1. Anyone looking for a place in Arcadia that has just been recarpeted, redraped and repainted can contact Hal's local representative for further heart-breaking details.

Welcome to Ed Larson and George Harlow of Humble, who have just transferred from Eugene, Oregon to undertake subsurface work in the Los Angeles office.

Gene Johnson, Shell, was recently nominated Secretary of the Coastal Geological Society by Frank "Mum-C-Puffs" Yule and was elected in spite of campaign promises of a drink for each vote cast for his opponent. We expect many good personal items as a result of this election.

Eric Lindvall Richfield, Ojai, recently decided to go into orbit via the electronics industry. Eric has resigned from geology to join an electronics firm in the San Fernando Valley. Rumor has it that Eric will earn more greenbacks as a trainee than he would as a senior geologist!!!

Have you noticed the quizzical look on the brow of Wayne Lowell? It seems that an original geological map of the Santa Monica Mountains that he loaned to an unnamed friend some 30 years ago, was returned by mail with an illegible signature.

Word has come in that John Kirkpatrick of Superior has been transferred to their Billings, Montana office.

Hurry - hurry - all prospective purchasers of Bull. 170, on the geology of Southern California, California Division of Mines, are advised to buy at the old price of \$12.00 plus 48¢ tax for California residents. All orders received prior to February 1, 1961, will be honored at the \$12.00 price. After February 1, 1961, the price for this set will increase to \$13.00 plus 52¢ tax for California residents. Copies of this set may be ordered by mail from either the Los Angeles office, 512 W. Fifth Street, or the San Francisco office, the Ferry Building.

Warren Woodward, formerly of Los Angeles, was recently transferred from Farmington, New Mexico to Shell's New York office.

Union Oilers up and down the coast and points east are tensely waiting for the tentative visit of the modern-day hatchet men, the "McKensie Raiders!". Reliable sources report that these efficiency experts do not sport horns or fangs!

Anchorage Petroleum Club members are anxiously waiting the picture spread in Sports Illustrated which will depict Gulf's Jim Wylie and Ivy League friends braving the wilds of Alaska on a moose hunt. It is understood that Jim missed the shooting of both moose and pictures.

Humble Oil's double switch brings in John Elliott from the Castaic office and sends Glen Specht from Los Angeles to Castaic.

Earl David, Shell Scout from Seattle, and Harry Jamison, Richfield geologist from Los Angeles, were recently seen together in the Chart Room Bar of the Westward Hotel in Anchorage. They were overheard discussing the relative merits of being trapped by bad weather in King Salmon or Yakataga.

Walt "Curly" Fillippone has left the Ivory Tower and is setting up shop as District Geologist in Union's Denver office.

The grapevine has reported Bob Paschall's grudging admission of actually enjoying his Los Angeles transfer from Ojai. Sheer heresy, Bob!

The Richfield Research Department is researching the identity of Santa Claus at John Wiese's Christmas-Housewarming party. The party was a tremendous success and it is only hoped that house damages were not too extensive.

Bob McConville, Signal Oil, was recently in town, thawing his bones during a well timed business trip from Signal's Calgary, Canada office.

J. Hubert Mee has joined Standard's Sacramento staff as area landman.

A recently observed get-together east of Piru involved Sam Cayetano and Oscar Oakridge, prominent tectonic experts.

New personnel to the Sacramento area are Joe Jones and Dorman Graves of Southland Royalty Company. Offices are at 3382 El Camino Avenue, Sacramento 21, California. Telephone is IVanhoe 33146.

A total of 15 U.S.C. alumni from the South San Joaquin Valley area got together to renew old ties December 15th, and found it to be such a success they would like to make it a regular affair. Interested ex-S.C.'ers should contact Dick Pierce, Richfield, Bakersfield at TEmple 1-1600. Turning out were: Glenn Ferguson (I. W. Bosworth), Bill Lewis (Standard), Ray Knight (Franco-Western), Al Simpson (McCullough), Ed Sprotte (Shell), Vince Scurry (Texaco), Ed Karp (Kern Oil), Ralph Brodek (KCL), Hank Walrond (Sunland Refng.), and Warren Stoddard, Bill Horsely, Hal Reade, Ray Arnett, Dick Pierce (Richfield).

Jean Senteur deBoue, Gaviota Consultant, has donated a free course of exercise at Slenderella reducing salon to his good friend Jim O'Neal, Montgomery Drilling, Bakersfield. Jim has lately been accused of wearing leg-o-tards to work but claims they are only tight trousers.

The Continental crowd is on the move. Chuck Norman has been transferred from Bakersfield to Los Angeles and passing him on the Ridge Route was A. T. Anderson moving from smog valley to fog valley.

NURSERY NEWS

Quentin and Susan Moore, Mobil Oil, Santa Fe Springs, have added a fourth member to their family. Susan Virginia was born November 29, 1960 and weighed 8 lbs. and 6-1/2 oz.

Pat and Frank Exum of Ohio Oil, Los Angeles, beat the income tax deadline with the arrival of Susan Elizabeth, 7 lbs., on December 28.

Tod and Babette Harding, Humble Oil, Los Angeles, are pleased to announce the arrival of their first daughter, Helene Elizabeth, born on November 18, 1960. She is the Harding's third child.

Bill and Dee Adent of Wico Oil Company, Sacramento, are the proud parents of a new daughter, Alicia, born on October 27, 1960.

Dave and Coleen Engstrom, Standard Oil, welcomed their second son, John David, on December 7th. John David weighed 8 lbs., 7-1/2 oz.

Lowell and Colette Garrison of Gulf Oil, Sacramento, announce the arrival of a daughter, Nicole, born on November 10, 1960.

CALENDAR

January 10, 1961: Sacramento Geological Society, William B. Bull, U.S.G.S., Sacramento, "Tectonic Significance of Alluvial Fans" and Charles A. Lee, Engineer with P.G.E., "History and Development of McDonald Island Gas Field, San Joaquin Co., California."

January 12, 1961: Thursday noon, S.E.G. Luncheon, Rodger Young Auditorium, Los Angeles. A tour of the plant of Fairchild Aerial Surveys, Inc. will follow the luncheon.

January 16, 1961: Los Angeles Forum Meeting, 7:00 P.M. sharp, Union Auditorium, Union Oil Building, Los Angeles. "Financing Wildcat and Development Wells", Richard C. Bergen (O'Melveny and Myers), "Bank Financing of Oil and Gas Properties", R. L. Hock (Vice President Oil and Gas Division, Citizens National Bank), Moderator, Milton W. Lewis (Consultant).

Following the talks, for those interested, a movie of the recent disturbances at the House Un-American Activities Committee Session in San Francisco will be shown.

January 18, 1961: Wednesday evening, 6:30 P.M., Coast Geological Society dinner meeting, Wagon Wheel Restaurant, Oxnard (Jct. of US 101 and 101A); "Geology Along Hadrian's Wall, England", by Dr. William H. Easton, Professor of Geology, University of Southern California.

February 2, 1961: Thursday Noon, A.A.P.G. Luncheon Meeting, Rodger Young Auditorium, Los Angeles. Robert H. Paschall (Signal), "Dip-Slip Versus Strike-Slip Movement on the San Gabriel Fault."

February 6, 1961: Monday Evening, 7:30 P.M., Science and Engineering Building, Room 56, Bakersfield College, Dr. Harold E. Sullwold, Jr. (Consultant), "Turbidity Currents."

BIBLIOGRAPHY OF RECENT PUBLICATIONS

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, Bulletin, vol. 44, no. 12, December, 1960.

Relation of deformational fracture in sedimentary rocks to regional and local structure, by John F. Harris, Garvin L. Taylor, and Jack L. Walper.

Electric log interpretation in exploring for stratigraphic traps in shaly sands, by Howard A. Slack and Carol Otte.

Recent domal structures in southeastern New Mexico, by James D. Vine.

Concepts of foraminiferal paleoecology, by Orville L. Bandy and Robert E. Arnal.

AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS, (Tulsa, Oklahoma).

Stratigraphic cross section of Paleozoic rocks, West Texas to Northern Montana, edited by John C. Maher (1960). (\$4.00; to members, \$3.00).

WESTERN OIL AND REFINING, Vol. 57, No. 12, December, 1960

Why drill in the Sacramento Valley, by Eugene F. Reid.

WESTERN OIL AND REFINING, Review Number, vol. 57, no. 12, November 15, 1960

Alaska, its infant oil industry is beginning to grow up, by Charles W. Barnes.

Gas was the star in California during 1960, by L. P. Stockman.

Exploration in the Pacific Northwest, by R. J. Deacon.

Alberta-California pipeline stimulates Canada, by Leslie Orr Rowland.

California waterflood practice, by API Pacific Coast District Study Committee on Fluid Injection.

Refinery construction will stress quality not quantity, by Dr. Clyde Berg.

West Coast refining review, 1960, by L. K. Cheney.

WORLD OIL, volume 151, no. 7, December, 1960

Abo reef play in southeast New Mexico, by William J. LeMay.

New pipe configuration reduces wall sticking, by Fred K. Fox

How to determine permeability from well log data, by Karl P. Johnson.

OIL AND GAS JOURNAL, vol. 58, no. 46, November 14, 1960

Sacramento Valley is hottest California exploration prospect.

OIL AND GAS JOURNAL, vol. 58, no. 45, November 7, 1960

California toys with leasing change.

OIL AND GAS JOURNAL, vol. 58, no. 48, November 28, 1960

Market for Russian exports has limits, by Paul Swain.

New electric rig is compact, portable, flexible--for Rocky Mountain drilling, by F. R. Mayer.

Swan Hills may be Canada's largest reservoir, by Frank J. Gardner.

U. S. GEOLOGICAL SURVEY

Professional Paper 365: Apparent resistivity of a single uniform overburden, by Irwin Roman...\$.70

Circular 435: Summary of preliminary findings in ground-water studies of southern Oahu, Hawaii, by F. N. Visser, and J. F. Mink. 16 pages.... Free

Circular 434: Progress report on use of water by riparian vegetation, Cottonwood Wash., Arizona, by E. L. Hendricks, William Kam and James E. Bowie.....11 pages..... Free

OPEN FILE REPORTS

Geology of the Baldwin Hills area, California, by R. O. Castle.....Inspection Only.

Surficial geology of the Beverly Hills and Venice quadrangles, Calif., by R. O. Castle.Inspection Only.

Preliminary geologic maps of the La Habra and Whittier quadrangles, Los Angeles Basin, California, by R. F. Yerkes....Inspection Only.

Geologic interpretation of magnetic data in the Copper River Basin, Alaska, by G. E. Andreassen, Arthur Grantz, and Isidore Zietz.....Inspection Only.

BOOKS

How to collect mountains, by Charles Hunt. 38 pages, 1958. W. H. Freeman and Company, San Francisco, Calif.....\$1.25

Paleogeologic maps, by A. I. Levorsen. 178 pp. 102 ill., 1960. W. H. Freeman and Company, San Francisco, Calif.....\$6.00

Many geologists on the Pacific Coast may be interested to learn that the results of a comprehensive study of Cretaceous Ammonites of California and Alaska by T. Matsumoto have now been published and a limited supply of these publications are now available for sale at the Stanford Bookstore, as follows:

T. Matsumoto, 1959, Cretaceous Ammonites of California, part I: Memoirs of the Faculty of Science Kyushu University, Series D, Geology, v.8, no. 4, p. 91-171, 16 plates.....\$3.00

-----, 1959, Upper Cretaceous
 Ammonites of California, Part II:
 Memoirs of the Faculty of Science
 Kyushu University, Series D,
 Geology, Special volume I, 172 p.,
 41 plates.....\$6.00

-----, 1960, Upper Cretaceous
 Ammonites of California, Part III:
 Memoirs of the Faculty of Science
 Kyushu University, Series D,
 Geology, Special Volume II,
 204 p.....\$3.50

-----, 1959, Cretaceous Ammonites
 from the Upper Chitina Valley, Alaska:
 Memoirs of the Faculty of Science
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PACIFIC PETROLEUM GEOLOGIST

NEWS LETTER OF THE PACIFIC SECTION
AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS

ASSOCIATION ACTIVITIES

Volume 15

February 1961

Number 2

NATIONAL A.A.P.G. PRESIDENT

Mason Hill has been elected President of The American Association of Petroleum Geologists. He will assume office at the National Meeting in Denver, April 24-27.

SPRING MEETING

A two-day joint meeting of the Pacific Section A.A.P.G.-S.E.P.M.-S.E.G. is planned for May 12-13, 1961 in Bakersfield. Papers will be presented on Friday followed by an evening dinner meeting. A field trip to the south end of the San Joaquin Valley is scheduled for Saturday.

The usual fall meeting of the Pacific Section will not be held in 1961, and in 1962, the section meets jointly as host with the National A.A.P.G. in San Francisco.

SACRAMENTO PETROLEUM ASSOCIATION

The Sacramento Petroleum Association held an inaugural at the El Rancho on January 20th. It was second only to the one farther east held that same day.

Frank Jacobs (Union) spoke on "Fifty years of Petroleum". Newly installed officers for 1961 are:

Art Hawley (President)
Ron Ackerley (Vice-President)
John Evers (Secretary)
Joe Parmenter (Treasurer)

!!! 1961 DUES !!!

To those of you who have not yet paid your 1961 dues..... This is the last issue of the Newsletter that will be sent until dues are paid.

Mail you check for \$3.50 to:

Mr. Richard L. Hester
Pauley Petroleum Inc.
10,000 Santa Monica Blvd.
Los Angeles 25

LOS ANGELES LUNCHEON MEETING

A regular monthly noon luncheon was held at Rodger Young Auditorium, January 5, 1961. D. G. Herring, Jr., (Texaco) presented an unusually fine group of colored slides on the geology, geography, culture, and ancient history of Libya.

Most of Libya is a near-featureless desert with slight topographic relief and scant vegetation. Outcrops of significant thickness are

restricted to mountains in the northwest, where Triassic, Jurassic, and Cretaceous carbonates may be observed, and to mountains in the northeast, where the Eocene and Upper Cretaceous are exposed. A Tertiary embayment, reflected by the present outline of the Gulf of Sirte, allowed deposition of carbonates, from which the bulk of the presently discovered oil comes. The structures show little compressional type folding, and five degrees is a steep dip. These gentle folds may represent draping over basement horsts and grabens.

Most of Libya's people live on the coastal fringe along the Mediterranean. Tripoli and Benghazi, the largest cities, have populations of approximately 150,000 and 20,000 respectively.

Historically, this part of North Africa has always been under foreign domination. About 800 B.C. the Phoenicians founded Carthage and other settlements in present-day Libya. The Greeks moved into Cyrenaica about the same time, occupying a coastal strip. Neither the Greeks, the Phoenicians, nor any of their successors succeeded in conquering the interior.

Around 250 B.C. the Romans overthrew the Greeks and Phoenicians in North Africa, and developed a high level of culture. Many fine buildings were built, but were later covered by sand and were not excavated until the 20th Century. North Africa reached a peak about 200 A.D. and declined thereafter with the Roman Empire. With the final collapse, Arabs and Turks became the rulers, and the Ottoman Empire held Libya for 1000 to 1200 years. In 1911 Italy took over, building roads and cities and contributing many Italian nationals as colonists. After World War II, Libya was a ward of the United Nations until 1952, when it became an independent nation.

The dominant influence today is Arabic, modified by the Italian occupation. Several thousand people of Italian descent live in Tripoli and other cities, dominating the business life. Higher education is rare among the Libyans, and only about 700 have college degrees. Very few of these have technical knowledge.

Nationalism is strong and, according to Herring, is likely to be felt more as actual production is established. At present, red tape and delay in the government causes problems for the operating companies.

SACRAMENTO GEOLOGICAL SOCIETY

Charles A. Lee (P.G.E.) and William B. Bull (U.S.G.S.) recently presented the following papers before the Sacramento Geological Society:

McDonald Island Gas Field (C.A. Lee):

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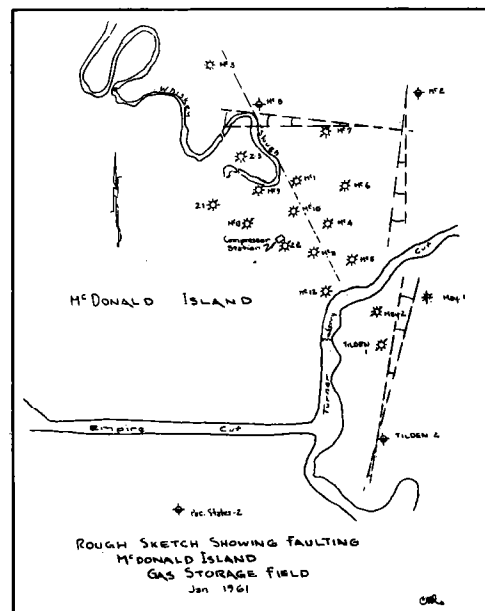
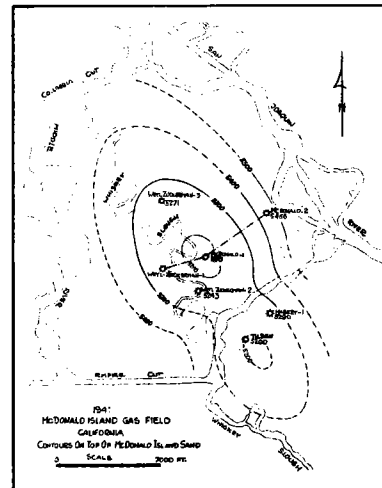
The P.G. and E. Co. has a gas demand that is widely variable throughout any given year. As California's population has grown, so has this variation in demand. The existing and proposed supply lines of interstate gas necessarily are operated at near maximum capacity on a year round basis. For this reason, additional capacity is needed for winter peak loads and inversely, there is a smaller market for the steady supply during low load periods in the summer.

One of the most effective methods for combating this problem lies in storing that surplus supply during off-peak load periods and withdrawing this stored gas during peak load periods. When the McDonald Island program is complete, 30 billion cubic feet can be stored as in-and-out gas. An average of 150 million cubic feet a day is the planned injection rate and withdrawal rates will vary between 150 to 400 Mmcf/D.

The Standard Oil Company wildcat well, McDonald Island Farms No. 1, (1936) paid out at a discovery pressure of 2086 psig at approximately 5150 feet. Five additional wells were drilled within a few years after the original discovery. This development indicated the field to be a domed trap with the sand having good porosity and permeability. The McDonald Island sand is the producing gas sand of the structure. It is a fine- to medium-grained friable gray sand, with interbedded siltstone, brownish-gray shale, and occasional streaks of carbonaceous material.

In 1949-1950 Standard drilled five additional development wells and built the combination 16"-18" main from the Island 16 miles westerly to the Brentwood Terminal Station. At this time it was determined that the field was ideally located and structurally suitable for gas storage after depletion of the native reserve. Standard produced the field until the pressure had declined to 450 psig in February of

1958. During March of 1958 the P.G. and E. Co. and a subsidiary conducted injection tests on the Island using transmission main pressure from Brentwood Terminal Station.



Pressure observations between March and September of 1958 indicated the possibility of water encroachment into the sand. Accordingly, P.G. and E. personnel began gas injection in September with an available line pressure of 610 psig. On 11 December 1958, Natural Gas Corporation of California completed negotiations with Standard and ownership of the field rights came under P. G. and E. control.

A 3000 HP compressor station at Brentwood was engineered and constructed allowing a maximum line pressure of 867 psig at 75 Mmcf/D. With this source of pressure the field has been brought back to 780+ psig at present. An ultimate minimum field pressure of 900 psig will be maintained and operations will vary between 900 psig and 1500 psig in order to store the 30 billion cf. In order to reach a field pressure of 1500 psig and in order to attain the 400 Mmcf/D production rate, the P.G. and E. will accomplish the following construction work:

1. Drill a total of 16 new gas wells in addition to the five

drilled in 1960 and install collection mains thereto.

2. Construct a 3000 HP compressor at McDonald Island. This will be in addition to the 2000 HP compressor now being completed.
3. Construct a 2500 HP compressor at Brentwood.

FACTS

1. McDonald Island Gas Field production prior to P.G. and E. acquisition - 148 billion cubic feet.
2. Estimated original gas volume - 178 billion cubic feet.
3. Estimated size - 1600 acres with approximately 81000 acre feet of sand.
4. Ground elevation in the field averages 10' below Delta water levels. This water is held back by 16' high levees.
5. Peak soil in the field erodes, decomposes and compacts at an average rate or 4-1/2" a year.
6. The entire operation is designed to be automatic and remotely controlled from Brentwood. The compressors as well as the wells will be controlled by "push button" operation.
7. Due to the instability of the peak soil, the McDonald Island compressor station rests on 70' cast in place cement piles - the area supported by these piles is 80' x 100'.
8. The compressor at McDonald Island and the well head controls are designed to operate under a 20' head of water. The compressor is elevated above ground level by concrete columns which rest on the pilings.
9. 54 billion cubic feet will remain in the field as cushion gas. This estimated figure stems from the minimum field pressure of 900 psig.

Tectonic Significance of Alluvial Fan Geomorphology in Western Fresno County (W. B. Bull):

The geomorphology of the alluvial fans along the western border of the San Joaquin Valley in western Fresno County, Calif., is interesting because the fans are classic examples of segmented fans, and because their shape can be used to help decipher part of the tectonic history of the area.

The overall radial profiles of the alluvial fans are gently concave upward, but the slope does not decrease at a uniform rate away from the mountain front. Instead the radial profiles are segmented. Profiles of fans whose streams head in the foothill belt have three straight-line segments; profiles of fans whose streams head in the main Diablo Range have four segments: three are straight lines but the uppermost segment may be concave upward.

The uppermost fan segments and the valleys upstream from the fans for a distance of 1/2 to 1 mile have the same general slope. High terraces found in some drainage basins may indicate that intermittent uplift has steepened the slope of the valley floor upstream from a fan. A rapid change in the valley slope may produce a straight-line segment, but a gradual increase in the

valley slope may be accompanied by a gradual steepening of the fan, resulting in a concave upward fan segment.

Stream-channel trenching helps preserve the upper one or two fan segments by preventing deposition on the fan surfaces within the extent of the trenching.

Fan segmentation may be useful for deciphering part of the diastrophic history of mountain ranges, because the fan profile and the volume of material within a given fan segment reflect the erosional and diastrophic conditions within the drainage basin. The segmented fans of western Fresno County indicate three or four episodes of uplift of the Coast Ranges rather than continuous uplift. Part of the uplift may have occurred in the last 3,000 years. Charcoal that was 10.5 feet below the surface of the upper fan segment of the Arroyo Hondo fan was 1,040 ± 200 years old according to a radiocarbon age determination. The total thickness of deposits of the fan segment at this locality is estimated to be 24 feet, which suggests that the segment is 2,000 to 3,000 years old, if a similar rate of deposition existed throughout its history.

INTRODUCTORY PETROLEUM GEOLOGY COURSE OFFERED BY U.C.L.A.

The University Extension of the University of California will offer a course on Introductory Petroleum Geology during the spring. The class will meet at the U.C.L.A. campus, Room 3656 Geology Building, for 18 weeks starting Monday, February 6th. Hours each Monday night are from 7:00 to 9:30 p.m. Three units of university credit are offered and enrollment fee is \$35.00. Richard L. Hester of Pauley Petroleum Inc. is the instructor.

The course covers the processes and materials of physical and historical geology with emphasis on applications to petroleum, with a study of the natural occurrence of petroleum and the geologic principles, methods, tools and techniques by which it is found and produced.

The course will be of particular benefit to those persons working for oil companies, but not directly involved with petroleum geology; such as, secretaries, draftsmen, landmen, engineers, and students.

SAM DOLMAN - TESTIMONIAL DINNER

Sam Dolman, consulting geologist, Santa Barbara and former president of the Coast Geological Society, was honored by a testimonial dinner at the La Cumbre Country Club in Santa Barbara on January 14, 1961. A group of approximately 67 friends, associates and wives gathered to pay tribute to Sam for his outstanding qualities which have endeared him to his friends and associates. Sam was presented with a scroll containing telegrams and letters of congratulations and a silver-plated geologist pick. Also, the local Santa Barbara luncheon group which meets every Tuesday will be known henceforth as the "Dolman Club". In addition to the above a large birthday cake was wheeled out to celebrate Sam's 74th year as a fine friend and member of the oil industry.

A brief biographical sketch follows: born in Brainerd, Kansas, 1887; graduated from the University of Kansas in 1910; following graduation did mining work in Mexico; in the early 20's worked for the Ray Consolidated Copper