them, staged at the St. Louis Art Museum preceded by luncheon in the Main Gallery; a visit to Ulysses S. Grant's farm, now brewer August A. Busch's 250-acre estate with its 34-room mansion, its Bauernhof, its zoo containing animals from all over the world, and a miniature train to carry you around.

Student housing.—Special low-cost, dormitory-style housing is being provided for students. Requests for these accommodations must be submitted on special forms, copies of which are available to college and university departments on application to A. F. Frederickson, Stanolind Oil and Gas Co., Box 591, Tulsa, Oklahoma.

Alumni functions.—Arrangements for alumni breakfasts, luncheons, and similar functions will be handled by a committee also headed by A. F. Frederickson.

Exhibits.—Monday, April 1, has been designated Exhibits Day. The newest equipment and techniques used in petroleum exploration, and maps and cross sections of geological societies, geological surveys, and university departments, will be displayed in Kiel Auditorium. A Convention Theater in the exhibits area will offer continuous free showings of outstanding films relating to exploration and other phases of the petroleum industry, throughout the convention. Applications for commercial exhibit space should be addressed to Claude Roark, Buffalo Oil Co., First National Bldg., Tulsa, Okla. Daniel F. Merriam, Kansas Geological Survey, Lawrence, Kansas, is in charge of educational exhibits.

Employment interviews.—An Employment Interview Bureau, bringing together employers' representatives and students and others seeking employment as geologists, paleontologists, and geophysicists, will be in operation for the duration of the convention. Announcements and other information may be obtained from R. C. Pattison, Warren Petroleum Co., Box 1589, Tulsa, Okla.

Field trip.—The field trip committee, headed by Thomas R. Beveridge, State geologist of Missouri, is arranging a tour of St. Louis County, Missouri, with perhaps an extension westward to visit exposures of upper Cambrian and lower Ordovician rocks equivalent to the Ellenburger and Arbuckle of Texas, Oklahoma, Kansas, and adjacent areas. Additional information may be obtained from T. R. Beveridge, Box 250, Rolla, Missouri.

Student contest: educational exhibits.—In order to encourage greater student participation in the national convention, the Educational Exhibits committee for the AAPG-SEPM annual meeting in 1957 at St. Louis announces a student contest for the best educational exhibit. All college and university recognized student organizations of the earth sciences are eligible for the competition. The theme of the displays will be any phase of the geology of petroleum. A first prize of $50 will be presented to the organization judged to have the best exhibit, and if there are more than ten entries, additional prizes will be awarded. For information write Daniel F. Merriam, Chairman, Educational Exhibits, Kansas Geological Survey, University of Kansas, Lawrence.

PACIFIC SECTION ANNUAL MEETING, LOS ANGELES, NOVEMBER 8–9, 1956

ABSTRACTS

DONALD E. BARRETT, General Petroleum Corporation, Sacramento, California

History of Exploration and Development of Willows-Beehive Bend Gas Field

The Willows-Beehive Bend gas field is in the center of the Sacramento Valley, approximately 70 miles north of Sacramento, California. The first gas in the area was discovered in 1937 in the old Willows gas field. A period of inactivity followed until production was developed in 1953 in the Beehive Bend field. A productive area approximately 10 miles in length and 2–3 miles wide has been delineated, with total productive limits not yet defined.

The sedimentary column from youngest to oldest is: Tehama formation (non-marine Pliocene); Kione formation (marine Paleocene and/or Upper Cretaceous); and the Chico formation (marine Upper Cretaceous). Gas is produced from sands of the Kione and Chico formations which aggregate

(*Continued on page 352*)

(This is copy of form already mailed to members)

APPLICATIONS FOR HOUSING ACCOMMODATIONS

A.A.P.G.-S.E.P.M. St. Louis, Missouri
ANNUAL MEETINGS April 1–4, 1957

For your convenience in making hotel reservations for the 1957 convention, St. Louis hotels and their rates are listed below. Use the form at the bottom of this page, indicating your first, second, and third choice; detach and mail. Use duplicate form immediately below for your own record of your request. Because of the limited number of single rooms available, you will stand a better chance of securing accommodations of your choice if your request calls for rooms to be occupied by two or more persons. All reservations must be cleared through the Hotels Convention, Reservation Bureau. ALL REQUESTS FOR RESERVATIONS MUST GIVE DEFINITE DATE AND HOUR OF ARRIVAL AS WELL AS DEFINITE DATE AND APPROXIMATE HOUR OF DEPARTURE: ALSO NAMES AND ADDRESSES OF ALL PERSONS WHO WILL OCCUPY RESERVATIONS REQUESTED MUST BE INCLUDED.

Hotel	*Rooms for Two Persons*			
	Singles	*Doubles*	*Twins*	*2-Room Suites*
Chase	$ 8.50–13.00	$12.00–15.00	$13.00–16.00	$23.00–55.00
*Claridge	4.50– 8.00	6.50–10.00	7.50–12.00	16.00–18.00
Coronado	7.50–12.00	9.50–16.00	9.50–16.00	17.00–40.00
*Lennox	6.50–11.00	7.50–11.00	11.50–13.00	20.00–35.00
*Mark Twain	5.50– 8.50	7.50–10.00	9.00–11.00	15.50–24.00
*Mayfair	6.50–11.00	7.50–13.00	11.00–12.00	17.50–25.00
Melbourne	5.50– 9.50	7.00–10.50	9.00–12.00	15.00–23.00
Park Plaza	10.00–14.00	14.00–16.00	14.00–18.00	24.00–40.00
*Sheraton-Jefferson	7.35–10.85	10.35–13.85	12.35–16.85	25.00–42.85
*Statler	6.50–12.00	10.00–14.00	11.50–15.00	28.00–35.00
*Warwick	4.50– 6.00	5.50– 8.00	7.50–10.00	

* Downtown hotels. In the event that the hotel room rate structure is changed prior to the above convention the rate will be changed accordingly.

ALL RESERVATIONS MUST BE RECEIVED PRIOR TO MARCH 1, 1957
Hotels Convention Reservation Bureau, A.A.P.G.-S.E.P.M.
Room 406A—911 Locust Street, DON'T BE A "NO-SHOW"
St. Louis 1, Missouri.

Please reserve the following accommodations for the A.A.P.G.-S.E.P.M. Meetings in St. Louis, April 1–4, 1957.

Single Room _____ Double-Bedded Room _____ Twin-Bedded Room _____

2-Room Suite _____ Other Type of Room _____ First Choice Hotel _____

Rate: From $ _____ to $ _____ Second Choice Hotel _____

Third Choice Hotel _____

Arriving at Hotel (date) _____ hour _____ A.M. _____ P.M.

Leaving (date) _____ hour _____ A.M. _____ P.M.

THE NAME OF EACH GUEST MUST BE LISTED. Therefore, please include the names of both persons for each double room or twin-bedded room requested. Names and addresses of all persons for whom you are requesting reservations and who will occupy the rooms asked for:

_____

_____

_____

(Individual Requesting Reservations)

Name _____

Company _____

Address _____

City and State _____

If the hotels of your choice are unable to accept your reservation the Hotels Convention Reservation Bureau will make as good a reservation as possible elsewhere, provided that all hotel rooms available have not already been taken.

9,000 feet. The oldest Upper Cretaceous rocks are Cenomanian in age (Goudkoff "H" zone), and these lie unconformably on quartz diorite, Sierra-type basement.

Exploration efforts in the initial stages were based on the drilling of what appeared to be structural anomalies. Well control since has indicated that structural closure is a minor contributing factor to gas accumulation. The bulk of the gas accumulation occurs in sand lenses along the flank of a gentle southeasterly plunging nose. Traps primarily are due to lateral and updip disappearance of these sands, and to less degree, to faulting. This lenticularity of sands has resulted in a high dry-hole ratio for normal field development.

C. L. DOYLE, General Petroleum Corporation, Sacramento, California
Santa Fe Pool Development Santa Fe Springs Oil Field, California

Development of the Santa Fe pool was begun with the completion on February 2, 1956, of General Petroleum Corporation's Santa Fe 243 from intervals between 8,050 and 9,010 feet. The initial flow rate was 1187 B/D, 33.3° oil with 844 Mcf/D gas.

The pool underlies the Clark-Hathaway zone, the deepest previously known commercial zone in the field which was discovered and developed between 1928 and 1930. A number of sub-Clark-Hathaway tests have been drilled since 1930. Late discovery of the pool was a result of its small size and the fact that the accumulation is not coincident with the best structural location of the shallower zones.

The Santa Fe pool is of late Miocene age and composed of a series of relatively low-permeability sands with interbedded shales. Total sand in the section is 300–350 feet. Primary control of the accumulation is structural with the crest offset easterly from that of the shallower zones.

The pool has a productive area of about 100 acres. Water is present in members between the producing zones. Gas-bearing members are found at high structural position.

Development of the pool has been rapid, for in spite of its small size, ten operators hold productive land. Well spacing varies from less than an acre to 10 acres. Production practices have been highly competitive, with all sands of the pool open to production.

ARCHER H. WARNE, Richfield Oil Corporation, Bakersfield, California
Structure of Wheeler Ridge Oil Field

Wheeler Ridge is a prominent topographic feature which stands out slightly from the southern margin of the San Joaquin Valley. This ridge is the surface expression of an anticline which contains nine or more oil-producing zones. The structure in all zones is that of an asymmetrical closed anticline, but the series of strata are separated into a hanging wall and a footwall group by a low-angle thrust fault. This thrust fault is nowhere exposed in outcrop, and it was long after discovery of the field that it became a known structural feature.

Maps and cross sections indicate that the movement on this fault was complex, and that, although the hanging wall and footwall anticlines are similar, they are genetically unrelated. Hanging wall structure therefore gave little clue, during early deeper exploration, to axial trends and the whereabouts of structural highs in the footwall block. Both structural blocks contain lesser faults, mainly of the thrust type. One of these is extensive enough to form an intermediate block containing several oil pools.

The Eocene rocks are cut by high-angle faults which cause anomalies in thickness and position of sands, and oil-water contact offsets.

Wheeler Ridge lies within the angle formed by the San Andreas and Garlock faults and is 12 miles north of their point of intersection. Also it lies on the probable extension of the steep buried White Wolf fault. Asymmetry of folds, multiple thrusting, and a component of strike-slip movement are effects to be expected in the area of the San Andreas-Garlock fault systems.

DONALD B. MCINTYRE AND JOHN S. SHELTON, Pomona College, Claremont, California
Preliminary Report on Tectonic History of Vizcaino Peninsula and San Benito Islands, Baja California, Mexico

Under the auspices of the Scripps Institution of Oceanography three visits have been made since April, 1955, to areas on the west coast of Baja California, 300–350 miles south of San Diego. Reconnaissance geologic maps have been prepared of the San Benito Islands and the nearby northwest part of the Vizcaino Peninsula.

Laboratory study of the rocks and fossils is not yet complete, but systematic examination of the areas shows the following.

1. Probably more than 10,000 feet of pre-Miocene chloritic sandstones, grits, and conglomerates occur in two series separated by faulting. A variety of intrusive and extrusive igneous rocks is confined to the older series, and probable Middle Cretaceous ammonites occur sparingly in the younger series.

2. These are unconformably overlain by more than 1,700 feet of highly fossiliferous middle Miocene siltstones, sandstones, and shales, locally of Monterey facies.