the president’s page

We at Western have never attached particular significance to the coming and going of the years. Usually we are much too busy to pause on our Company’s birthdays for nostalgic reminiscences. In fact, our Silver Anniversary issue of the Western Profile five years ago is the only special recognition given to the passing of the years since the inception of our organization.

As the end of our thirtieth year slipped past last month, however, I realized that no year has been more fruitful in terms of our progress in the science of geophysics — not even our first one. For this reason we owe the anniversary at least a friendly and grateful acknowledgment.

I call this to your attention, not to boast, but because it signifies to me that the people of Western are every bit as enthusiastic, alert, and aggressive today as they were in those early times when our work was all pioneering. While there is no substitute for experience (of which we have had our full share in the free world’s oil provinces), there also is no substitute for initiative, energy, and scientific curiosity. Thirtieth Anniversary Westerners have demonstrated an abundance of these qualities.

Readers of the Profile may remember some of the important announcements of the past year: the dual cable recording system, which proved to be a major breakthrough in marine seismology; our multirecorder magnetic tape compositing and transcribing system; and our visually displayed programmed gain control. From continued research on our transistorized recording instruments came an exceptionally fine VLF (Very Low Frequency) radio receiver.

Progress in geophysics involves field application, of course, as well as instrumentation. Here we have also experienced very gratifying advances. Westerners carried our petroleum geophysical data-gathering techniques into the “deep ocean” with spectacular results. The story of the first survey of possible sites for the Mohole into the earth’s mantle is told in this issue of the Profile. A second Mohole site survey is now in progress near the Hawaiian Islands. We also completed a large-loop (12-mile) continual observation magnetometer survey in Hawaii for the U. S. Army in connection with studies of hydro-magnetic waves (see the June 1963 Profile).

Working on the North Slope of Alaska, above the Arctic Circle, Westerners encountered a new type of extreme cold and solved a multiplicity of operating problems that had not arisen in other frigid areas. (This story also appears in this Profile.) Meanwhile in the “Empty Quarter” of the Arabian Peninsula other Westerners tackled a new desert environment where life is impossible during much of the year without air conditioning. This year also saw Western extend its services to Kuwait, East Pakistan, Australia and its adjacent waters, the North Sea off Denmark and Holland, and the Arabian Sea off West Pakistan.

Under construction in Anchorage is a new building for our Alaska offices and shops. Recently completed at our constantly expanding Shreveport division headquarters is a large installation for reproducing record sections in great volume and at high speed. Experts have told us that the massive camera equipment is the finest in the industry.

Near the end of the memorable third decade of Western’s history, our Company entered into its largest single contract. This was perhaps the biggest ever awarded to any geophysical contractor. The contract covering this survey, just recently begun in the Persian Gulf, came to us primarily because of the demonstrated superiority of our instrumentation and techniques in this difficult area.

Because of all that was accomplished in Western’s thirtieth year, therefore, and not because there is any magic in the number 30, I wish to express my sincere appreciation to all of you who made it possible.

Let me also note that the record of this past year bears out the truth of what I wrote to you last December: “The future with its opportunities for achievement is in our hands to do with what we will.”

Suren Salling
FAR FAR NORTH. Yes, the globe-encircling efforts of the petroleum industry in search for new Eldorados in oil have brought Western Geophysical Company and its Party 93 to the Arctic Ocean border of our most northerly state — and a crew cannot get much farther north than that and still be a land crew. Operating in the vicinity of latitude 70°, Party 93 is getting close to being at the top of the world. It was in early February that supplies and key personnel began to arrive in Fairbanks, “golden heart of Alaska,” which serves as base for this North Slope operation.

The North Slope can be loosely described as the vast area between the Arctic Ocean and the Brooks Range, which crosses northern Alaska from west to east and forms the northern boundary of the Great Interior. The entire North Slope region lies well within the Arctic Circle and is a white desert. As far as the eye can see, the landscape is a barren expanse of snow and ice. One might suppose the depth of the snow to be very great. Actually, except for drifts, it varies from a few inches to possibly two feet above the frozen ground. On the basis of precipitation, the North Slope is, in fact, a desert.

Temperatures in the area of crew operation ranged from 43° in late February to +46° in May. The cold here is different from that encountered in southern Alaska or the Rocky Mountain states. Perhaps it can be best described as a burning cold. A person receives the same sharp sting from the cold as he would from a burn. Even the ice is so super cold that it resembles “dry ice.” Working in the Arctic brings about a real awareness of this because any skin, moist or dry, will stick to cold metal. Therefore, the men have to exercise great care in handling all objects outdoors. Gloves are indispensable.

Adequate clothing for not only the hands but also the rest of the outer body becomes of utmost importance when one has to contend with both this cold and the strong winds that sweep unobstructed across this great white desert. Everyone wears a parka with a furry hood, which gives good protection for the face. Due to the bulky hoods, the men appear to be headless, no man is recognizable unless he is close enough for his face to be seen clearly. The field personnel also wear insulated and thermal underwear and mukluks. The latter are boot-like footwear of canvas. They have laces that bind the lower part of the
Driller Carl (Smiley) Marlette displays what the well-dressed North Sloper wears. Above, Smiley models the latest — and warmest — in ‘hats,’ the parka, a furry hood, which protects the face, as well as the head, from the bitter cold. At the right is Smiley in full trappings, including Arctic footwear, mukluks.

Put it: “You don’t have any sense of direction, you just feel suspended.”

Snow generally falls in early winter and early spring. The blowing snow, however, is not falling from above; it is caused merely by ground blizzards. The fury of a Rocky Mountain ground blizzard is no match for its Arctic counterpart. At times field personnel of Party 93 have had to rely on group stakes and empty fuel barrels to find their way back to camp when swirling snow obliterated tracks used for orientation purposes. On one occasion Surveyor Carlos Droescher and Rodman Tim Hartner had to use the chain to locate successive group stakes. It was a difficult and time-consuming process, covering four miles in 240-foot intervals with the survey truck. Said Carlos after the ordeal was over: “I put my nose to the ground like a bloodhound trying to find the path left by our track units.”

Besides the extremely cold temperatures, winds, and ground blizzards, Mother Nature offers some other rather unusual elements to the crew, such as sundogs (small or incomplete rainbows), northern lights, whiteouts, ice fogs, and days when the sun never sets (mid-May to mid-August). The ice fogs make plane landings even more hazardous than usual, and on occasions the planes have to be “talked in.” One time the radio operator told the pilot where he was at various points in his approach to the runway. She did this by watching the men outside, through a large picture window, as they pointed into

boot and then are wrapped around the leg and tied. Wool felt insoles, felt booties, and wool socks are worn inside the mukluks. Trouser legs are tucked into the upper part of the mukluks to retain body heat. The equipment, as well as the men, seems to be aware of this different type of cold, and it, too, has to have “clothing,” which will be described later.

The windstorms are so intense that whenever one is coming up there is nothing to do but to sit in camp and wait out the storm, whether it be for one day or several. Camp is set according to the direction of the wind so as to limit the drifting of the snow. Wind in this area comes from either the northeast or the southwest. Actually both, for it will blow from one direction and, when it reaches its peak, gradually calm. This does not mean, however, that activity can resume. Several hours later the wind will start up again from the opposite direction and blow itself out the other way.

During a windstorm visibility becomes almost nil, the snow swirls in all directions, the sun is vaguely outlined, and only patches of sky are visible. Party Manager Lloyd Logan’s order is that no one leave camp, for a person can become lost just a few feet from camp. By the time the storm is over, he may be dead or even never found. Being in one of these Arctic storms gives one the sensation of being in a vast void, for no matter in what direction one looks — out, up, or down — it is white. As one Westerner
the sky where they could hear, but not see, the plane. That plane made it safely—but they never did see it until it rolled up the runway in front of them.

The actual geophysical prospecting as carried out by Western on this Arctic North Slope makes for an exciting story. Party Manager Lloyd Logan and Party Chief R. C. (Rudy) Berlin were the first Westerners to arrive in Fairbanks, from where they directed the flow of supplies, equipment, and personnel, as well as a seeming million other details, large and small. Party 93’s first base of operations was near the mouth of the Colville River. Drillers Carl (Smiley) Marlette and Mack Towns, the latter from Western’s Los Angeles shops, were the first arrivals at the base. Smiley flew in on February 18 with groceries and garage plywood, and Mack came the next day with diesel fuel. Until camp was established, they stayed with Mr. and Mrs. Bud Helmerick, who have built their own home and runway and live in splendid isolation on the shore of the Arctic Ocean, with their own plane and radio station to keep them in touch with the world. Bud is a guide, pilot, sportsman, and, with wife Martha, has written a series of books about their Arctic adventures. Martha also doubles as housekeeper, cook, mother, and radio operator.

Last January Lloyd had gone from Anchorage to Calgary to oversee getting the recording units, drills, camp trailers, and other equipment mounted on tracks and ready for service. They were then trucked to Fairbanks. As this city is the end of all surface transportation, all equipment had to be flown over the range to Colville and thus had to be dismantled so that it could be loaded in C-82 “flying boxcars.” Therefore, with the equipment due to come in dismantled and by plane, the early arrivals had to do two things immediately — build a plywood garage large enough to hold a unit and complete a strip on which the large planes could land.

This they did, and the first plane brought in part of a D-6 caterpillar, which was to be used in clearing runways, hauling gear, and helping on heavy pulls. A second plane brought in the rest of the “cat” a few hours later. The first piece of track equipment, the shooting unit, took the most time to unload as airline employees had put it on the plane backwards, making it difficult to get it out. This took almost four hours. The fastest unloading was 14 minutes from the time the plane was down until it took off. (Because of the extreme cold, the men had to break every 10 minutes from taking the equipment from the planes so that the engines could be revved up to avoid oil freezing in the lines and making takeoff impossible.)

Planes came and went in such numbers that Colville seemed to be as busy as a huge international airport. As all the vehicles and equipment arrived, Mack and Smiley were able to assemble most of the units and get a lot of other work done in the garage before the other crew members arrived. These Party 93 Westerners, doodlebuggers with a wide range of backgrounds and much experience, flew onto the white scene at Colville during the first two weeks in March.

Also, Observer Supervisor Ben Niehenke came up from the Los Angeles laboratory to help get the recording unit and equipment in perfect operating order. Observer Neo Ferrari and Ben worked for several days in checking out the new unit prior to putting it in operation.

All of the units are diesel-powered. More than operational know-how, it takes a complete understanding of the equipment’s capabilities to make it function in the Arctic environment. Mack put it well when he said “A person might just as well forget all about how things are done in other parts of the world because up here it is different from anywhere else.”

One of the early difficulties encountered was in getting
the diesel motors up to their normal operating temperatures. This all took place in late March when the temperature was around 40°F. The engines would remain cold for hours. Mack and Lloyd, however, in true Western tradition found a way of solving the problem by insulating all of the openings in the engine compartments.

Earlier, while Lloyd was still in Fairbanks, Mack had radioed for two electric blankets, plainly not intended for personal sleeping comfort. The party manager later learned that the propane gas tanks in the kitchen unit did not care for this different, far Fair North cold any more than did some of the equipment. Mack wanted the electric blankets to keep the tanks warm so that the cook would have gas with which to prepare the hot meals.

Obtaining water for camp proved to be another problem for the Party 93 field crew. Holes drilled in lakes have encountered ice to the very bottom, and as a result it is difficult to obtain water for camp. One day while seeking camp water, Smiley was surprised to discover water gush-

Left—As surface transportation ends at Fairbanks, all vehicles had to be dismantled and flown over the Range in "flying boxcars" such as this one, which is parked almost on the Arctic Ocean while being unloaded. Below—Using the "cat" blade as a jack, Carl Marlette (right) and Mack Towns (center) put the wheels back on the unit as Harry Swayne kibitzes.

ing out of the hole. Imagine his reaction, though, when the water turned out to be saline. Unknowingly, the hole was drilled over the Arctic Ocean. In the wintertime in the Arctic there is no differentiation at all between land and sea along the meandering coastline.

The Party 93 field operation is approximately 400 miles from Fairbanks, and personnel and supplies are carried to and from camp by charter aircraft or regularly scheduled flights between Fairbanks and Umiat. From Umiat, helicopters and fixed-wing charters on skis or floats serve the camp. A helicopter is permanently assigned to Party 93, and its crew works in close harmony with Western personnel. Keeping the air strip cleared for these "birds" is the responsibility of the Western bulldozer. This 'dozer also insures that an adequate fuel supply is maintained from the fuel deports set up on various lakes in the area.

Camp is a "trailer town," which includes three sleepers with eight beds each, a combination office and sleeper with four beds, a kitchen-diner, a shower-utility, and a workshop unit. Each is well insulated and heated with an oil stove. They have been very comfortable even at these extreme temperatures. The kitchen-diner perhaps comes in for the most unanimous praise from the crew, not for the facility itself but for the excellent meals and ample servings prepared in it by the cooks.

Party 93 field crew made its first move when it left the assembly area at Colville on March 24, just five weeks after the initial piece of equipment had landed there. On this bright, clear, sunny, warm (18°F) day, the wide kitchen unit led the way, with the trailers and operating units falling in behind, to proceed to their first prospect along the Arctic Ocean coast at a 2 1/2-mile-per-hour pace. It was on their third day out that they encountered their first Arctic storm and all of its eccentricities, many of which are described in preceding pages. The men learned much about this unique, white land, dotted with snow-
covered lakes — and how to live with it and even admire it — as they made their initial work circle. They arrived back in Colville in mid-May and prepared for their next prospect, which was farther inland, higher, and drier.

While the field personnel were exploring in the Arctic Ocean area, the Party 93 men back in Fairbanks were kept busy not only filling the radioed messages for supplies but also interpreting the records. Their office is in

the building of one of the airways at Fairbanks International Airport. It is a particularly convenient spot inasmuch as this airway line is one of the two that handle a portion of the flight contact with the camp operation. The office accommodations are first class. As the owner of the airway and his wife are quite sports-minded, two of the rooms are adorned with the trophies of Dall sheep, and in other parts of the building can be found the trophies of deer, a stuffed pheasant, and a large oil painting of a moose. It is a good vantage point for observing the flight activities at the airport, and the view is attractive, especially by Fairbanks standards.

Away to the southwest lies Mount McKinley, or, as it is called by the natives, Denali, the High One. Reaching an elevation of 20,320 feet, Mount McKinley is the tallest peak on the continent. On exceptionally clear days the mountain can be seen from both Fairbanks and Anchorage.

The history of Mount McKinley is an exceedingly inter-
esting one. Though it was named for a United States president, the peak was known long before 1897 when word finally reached the outside world. A second mountain within McKinley National Park, Mount Foraker, is named for another Ohioan. Alaskans, being proud of their state, have tried in vain to change the names of these two peaks to something connected with Alaska rather than Ohio.

The early efforts to climb Mount McKinley have produced some heroic, as well as fanciful, tales. The claim of one explorer, Dr. Cook, who allegedly got to the top in 1906, proved to be false. He had persuaded his only companion to falsify the reports about reaching the summit and was also guilty of making false photographs. The distinction of finally making the ascent went to a team led by Archbishop Hudson Stuck, of Fairbanks, in 1913.

Fairbanks owes its birth to the discovery of gold in 1903. Near the geographical center of Alaska, Fairbanks is in the northern part of the Tanana Valley, one of the two chief agricultural areas of Alaska. How on earth a farmer can eke out a living from this barren land is one of the first perplexities of a cheechako (local jargon for newcomer or greenhorn). The veteran homesteader, or sourdough, must be a rugged and tenacious type of fellow.

To become an Alaskan sourdough, one has to endure an entire winter up here, like it, and be willing to stay for
more. Some refer to a sourdough as a person who has soured on the country and does not have the dough to leave. Be that as it may, one must have a great deal of "cookeyed optimism" to attempt farming in this land. The corn may never grow as high as an elephant's eye in Alaska, but the sourdough farmer is yearly betting on its being knee-high by the Fourth of July, the Iowa criterion for good corn.

Talk about betting. Some of the Party's members witnessed the exciting climax to the Nenana Ice Classic, famous throughout Alaska. This annual sweepstakes takes place at the confluence of the Nenana and Tanana Rivers.

Tens of thousands of lottery-minded persons try to guess the exact day and minute for the ice breakup in the Nenana River. A long pole with supports is driven into a hole cut in the ice. From the pole a wire is stretched through an ingenious mechanical setup and attached to an official timepiece on shore. This clock records the exact time when the ice movement in spring carries the pole downstream and sets off the mechanical device. This year more than $80,000 was divided among the winning entries. The 1963 lucky day turned out to be May 5. For the benefit of Western Profile readers in other states who might be thinking up ways to get rich quick in 1964, it must be added that the Nenana Ice Classic is a somewhat exclusive "casino." Tickets are sold only in Alaska, and several days before the expected breakup guards are posted nearby to insure that nobody tampers with the "croupier's wheel."

Another event of local interest was the Fairbanks Winter Carnival, held in the latter part of March. Ambitiously billed as the "Mardi Gras of the North," it included such attractions as curling matches, a folk dance festival, parachute jumping, art exhibits, Eskimo dances, blanket tossing, and the like. Of course, the main events are the mushing contests. A "musher" with a team of 11 dogs races three heats of approximately 30 miles each. No substitutions of dogs are allowed during the race, and the entire starting team must cross the finish line. The sport is very popular in Alaska but seldom seen in other parts of our country. Certainly not at the "other" Mardi Gras.

The University of Alaska is five miles from Fairbanks in the little community of College. Opened in 1922, it was known as the Alaska Agricultural College and School of Mines until 1935. In a beautiful setting on top of a hill overlooking Fairbanks, the University is the center of higher education in Alaska. Beginning with only six students, the college has grown from year to year. The
present enrollment is approaching 1,400 students. A campus development plan is scheduled for completion in 1975. The University of Alaska hopes by that date to accommodate about 5,000 students.

Of special interest to Westerners is the Geophysical Institute, established in 1949 by an Act of Congress. Equipped with a laboratory to carry out broad studies in the earth sciences, special emphasis is on geophysics as related to the Arctic.

Perhaps when Party 93 has completed the exploration of this prospect in the far Far North of Alaska, the Geophysical Institute will be even more interested in the Westerners than vice versa because of the experience that these men have gained in the vast white desert of our 49th State. At least, the Westerners will have an unique experience to remember for the rest of their lives, one that few others will ever have.

Top—A covered wagon of the Arctic-geophysical style. The windbreaks give drills the appearance of the Censtegus of the Old West.
Right—A helicopter view of Arctic drilling shows that when the mast goes up, the cover comes down to perform its function as a windbreak.
Western Surveys for Project Mohole

A potential site for the world’s deepest well—one completed through the earth’s crust—was surveyed by Westerners of special Party S-5 as a part of Project Mohole. Goal of the Project is to get a sample of the mantle, which is the part of the earth beneath the crust and which makes up seven-eighths of the earth’s volume. (The other eighth is the core — 2,000 miles down.)

Explaining the “Why?” of Project Mohole is not easy because there are many why’s. While it is convenient to sort the reasons into categories such as scientific, engineering, and commercial, there is so much overlap that these distinctions are more or less meaningless.

From the scientific point of view, Project Mohole is designed to answer a large number of questions, among which are: What happened to all of the sediments that must have been washed into the oceans over geologic time? What happened to all of the dissolved uranium that ran into the oceans from the world’s rivers? (Only the last 60,000 years’ worth are presently accounted for.) How were the oceans and continents formed? Of what is our earth made? (A knowledge of the exact nature of the mantle will greatly improve our ability to estimate the nature of the material that makes up the core.) What is the history of the molten rocks that come up through volcanoes and underground zones of weakness?

By-product scientific information from the Mohole Project will come from the ability to obtain observations of the ocean at a fixed spot for a long period of time, not only for the time that the hole is being drilled but after the hole is completed and permanent logging instruments are installed. Petroleum and mining industries should benefit greatly from the vastly improved knowledge of oil and mineral formation that will undoubtedly result from the drilling program. Important questions will be answered concerning the possible existence of useful minerals on and in the ocean sediments.

Those engineering advances that will be made in the course of drilling and logging the Mohole will be extremely useful in drilling deeper oil wells, drilling wells in deeper water, producing stable platforms for oceanographic purposes, and developing the myriad cables, pipes, propulsion systems, and vehicles that man will need in order efficiently to exploit the resources of the sea.

Project Mohole, as it presently exists, was conceived by a group of scientists in the spring of 1957. No formal organization sponsored this group. As a matter of fact, they called themselves the American Miscellaneous Society, or AMSOC. They prided themselves on having no charter, rules, dues, journal, or any other formalities of a regular association. As the idea for the Mohole grew and govern-
ment interest developed in the project to drill through the crust of the earth, the AMSOC group became a part of the National Academy of Sciences and acquired a staff.

A preliminary project sponsored by the Academy proved by actual test that it is possible to hold a drilling ship in place in water more than two miles deep, without anchors, simply by using four outboard motors and a control system based on sonar and radar measurements of distances to a group of buoys. At the same time the major oceanographic institutions ran a series of reconnaissance surveys in likely areas to find a thin spot in the earth's crust. Four likely areas have been nominated to date as a result of these programs.

Western's interest in Project Mohole began some years ago when information about the Project first appeared in print. Discussions between Western Geophysical representatives and the Project director began in 1960 when our Company presented its first tentative plans for conducting the deep-ocean seismic surveys that would be necessary to make a well location for the Mohole.

Early in 1961 the National Science Foundation, an independent agency of the United States Government, announced that it was going to seek a contractor to take over the entire Project and carry it to completion. Western was represented at the July 27 meeting in Washington at which the National Science Foundation described the duties of the proposed contractor and formally asked for bids. Western did not plan to submit a bid for the entire contract but actively co-operated with several prospective bidders in preparing the elaborate proposals that were to be submitted to the government.

Meanwhile, in order to prepare for deep-ocean surveying, a Western crew spent several days in experimental shooting in water two and one-half miles deep near the Bahamas. This work was primarily to find out how Western's ships and instruments would work under deep-sea conditions. (See Western Profile, December 1961.) Results of this experimental work were published in the Journal of Geophysical Research in May and November 1962.

Our experimental work in deep-ocean surveys prompted many of the bidders for the prime contract to accept our recommendations and advice in making their presentations to the Foundation. When the Foundation narrowed its list of prospective contractors from 26 to 5, it was found that four of the five finalists in the competition had named Western as one of their prospective sub-contractors. Results obtained in the deep-ocean Bahama experiments were presented directly to the Foundation in Washington by Western's Carl Savit as part of a larger presentation organized by Brown & Root, Inc., of Houston, the company that ultimately emerged with the prime contract.

Before we could begin actual work on the surveys, we had still another hurdle to cross. As required by government procurement regulations, Brown & Root invited proposals and bids from five geophysical companies to con-
dect the first preliminary surveys in the Outer Ridge area north of Puerto Rico and in the Barracuda Fault area east of Antigua. By this time our research staff had become quite experienced at preparing the 30-page, illustrated books and 10-page specification sheets that make up proposals acceptable to government agencies. This was their third formal proposal for survey work on the Mohole Project!

Western was awarded the contract just before Christmas last year. Plans got under way immediately, and by February 15, 1963, Western's recording ship, the Cedar Creek, and the shooting ship, Kay Walker, additionally rigged with special navigation gear, a deep-ocean fathometer (the Litton-Westrex WES-12 Echo Sounder and Precision Depth Recorder), and some miscellaneous oceanographic gear, were poised for action in the picturesque harbor of old San Juan, Puerto Rico.

Crew members arrived from all directions. Several had just completed a job in West Africa; Supervisor Fred DiGiulio, Observer Supervisor Ben Thigpen, and Chief Observer Charlie Crawford came in from Shreveport, Louisiana; Party Chief Charles F. (Chuck) Sebastian, Jr., came from Hawaii (with a short stop in Los Angeles); and Carl Savit and Don Blue arrived from the Los Angeles headquarters office. Carl directed the scientific aspects of the project, and Don was chief geologist. Brown & Root sent Lloyd Paitson, their chief geophysicist, to oversee the operation.

Fortunately, the Cedar Creek had been rigged to accommodate all of the extra crew members and Westerners who were to be on board, for, in addition to a normal complement, one extra ship's crewman was on board to keep the ship hovering or making oceanographic measurements during the nights. An experienced navigator, Capt. Thor Terjersen, made constant celestial fixes to check on the loran-A electronic navigation. The electronic navigation system itself was manned by two men on each ship. All in all, there were 18 men on the Cedar Creek and 10 on the Kay Walker.

Ship positioning was by loran, but ship-to-ship distances were controlled by shoran while the direction between ships was monitored by means of a radio direction-finder. In the Barracuda Fault area the loran-A stations were too distant to be of much use; so basic positioning was entirely controlled by celestial navigation.

Three completely different types of surveys were conducted in both areas. First, normal reflection shooting was performed on all lines, using the standard Western technique with a 2,300-meter cable. Reflection quality over much of the area was good to excellent, with penetrations below the bottom of up to three seconds (about 2 1/2 miles). Water depth ranged from about 2 miles to over 5 miles. The reflection sections obtained in this program were, so far as can be determined, the clearest, sharpest, and most penetrating ones ever obtained anywhere in the deep ocean.

A scientific first in oceanography was the determination of the detailed velocity values in the various layers of sub-bottom sediments by means of velocity surveys. A number of these were performed at various places. In the velocity survey (also called X^2, T^2 survey), the object is to get reflections from many layers below the bottom with varying distances between shot point and receivers. These Western velocity surveys in the Outer Ridge and Barracuda Fault areas were the first ones ever run in the deep oceans that gave separate velocities in individual sediment groups at specific localities.

Finally, actual depths to the mantle were to be determined by refraction surveys over both areas. Even in this, the oldest method of seismic crustal exploration in the oceans, Western contributed a significant improvement. By combining the reflection and velocity survey results with the refraction data, it was possible to make detailed adjustments for velocity changes in the sediments above the crustal, hard-rock layers.

Headquarters for the field operations were in an apartment on Punta las Marias (Point of the Marys) in the...
community of Santurce, a suburb of San Juan. Strung between the roofs of nearby buildings were the antennas that were needed to bring loran navigation signals and communication signals to the monitoring equipment, which occupied one room of the apartment. The dining-room table served as plotting board and drafting table for pre- and post-plotting of location maps.

Landlords of the apartment, Mr. and Mrs. Henry Carn, were, by coincidence, former residents of Los Angeles. They and their charming daughter Miriam helped to explain our project to the neighbors who kindly gave permission for stringing all the antenna wires. Supply man Mel Weidner made the myriad arrangements on shore that kept the sea-borne operations on schedule. His abilities were subjected to a real test when he found hotel accommodations for all Western, Brown & Root, and Westrex men who were to be in San Juan during the first rest period — this during a week when balmy Puerto Rico was completely filled with "refugees" from the United States East Coast, which was in the throes of a below-zero cold wave.

During this first rest period, Dr. William Tonking, deputy director of the Mohole Project, came to San Juan to examine, at first hand, the first group of records. He selected a particularly striking reflection profile across the Puerto Rico Trench to present to a meeting of the AMSOC group and the NSF a few days later.

During the rest period Supervisor Alan Knox, a Western research staff member, joined the crew to take over its technical direction as Carl Savit returned to Los Angeles to prepare for the exacting task of interpretation.

As this article goes to press, the field operations have finished, the field crew has gone on to other tasks, the magnetic tape processing has been completed, and the interpretation by the research department is nearly finished. Papers are being prepared for presentation at scientific and technical meetings and for publication, and a final report on the crustal structure of the two prospects is being readied for presentation to Brown & Root and the National Science Foundation.

Westerners can take pride in participating actively in a major research project that will have inestimable value to Geophysics and all the Earth Sciences.
PARTY 95—AHMADI, KUWAIT...

G. A. VORPAGEL, Reporter
ELIO SPURIO and J. R. SCOTT, Photographers

The sheikdom of Kuwait is presently the new home of Party 95 and has been since November 1, 1962, when it was re-activated. The members of the crew arrived at various times, after waiting for entrance visas or vacationing in popular cities of the Middle East. Following their departure from Party 93 in Libya, Drillers JIM MOORE and CHARLIE MARTIN, Surveyor HOWARD CRIDER, and Computer JIM SCOTT traveled in Italy and Lebanon enroute to Kuwait. Drillers ELIO SPURIO and CARMINE MANTINI left their families at home in Pescara, Italy, to join the crew. Drillers SAM MARTIN and JOHN CLINGAN and Computer BILL GOUZY, who had been with Party 74’s water crew, were well acquainted with Kuwait, having worked from there during the previous summer. Junior Observer LESLEY SCHMIDT and Camp Manager GEORGE VORPAGEL came directly from the States after a short wait for visas in Washington, D.C., and London, respectively.

Bordered on the east by the waters of the Arabian Gulf, on the north and west by Iraq, and on the south by Saudi Arabia and a Neutral Zone, the Sheikdom of Kuwait has approximately the same area as our own state of Connecticut. Even so, it is one of the most prolific countries in the world and ranks fourth in the production of petroleum. From the coast the desert terrain rises in gentle undulations until it reaches the depression of the Waid al Batin, which forms the western boundary.

Kuwait is more fortunate than other parts of the Gulf in that it has less of the intense humidity experienced elsewhere. The prevailing north wind, or shimal, is welcomed in the summer as a cooling breeze; but our crew regards it with some apprehension since it is often strong enough to cause severe sandstorms, which stop all seismic activity.

Before World War I this desert country had primarily an enterprising maritime population. Shipbuilding flourished, and cargoes were transported to ports all over the Middle East. In addition to shipbuilding and maritime trading, Kuwait was one of the chief centers of the pearling industry.

It was under Shaikh (Sheik) Sir Ahmad al Jabir al Sabah, ruler of Kuwait from 1921 to 1950, that the foundation of the oil industry was laid, and in 1934 the Kuwait Oil Company was formed. Shaikh Ahmad was succeeded by his cousin Shaikh Abdullah al Salim al Sabah, whose policy is to keep on good terms with all nations and to use the oil revenues for the improvement of his country while
launch was employed to carry men and equipment from the camp site to the areas of operation. To avoid time-consuming trips and to take advantage of all of the daylight hours, the crew worked from sunup to sundown.

Many of the shot points extended into the area between high and low tides, and it was during this time that Drillers John Clingan and Elio Spurio originated what Party 95 refers to as the “Kuwaitian Crawl” — that is, frantically waving both arms while waist deep in mud to avoid incoming tides.

Co-ordinating the lines between the lowlands and higher ground soon had Junior Observer Lesley Schmidt adept at transferring the instruments from the doghouse trailer to the recording truck.

This spring we had the problem of synchronizing our seismograph shooting with the cannon of Kuwait’s army and navy, who used many of our coastal prospects for target areas. The good reflections caused by this shooting possibly could be used if there were some way of eliminating the terrific ground roll!

Like the majority of Kuwait’s population, our local labor force is made up of many different nationalities. These include Saudi Arabsians, Persians, Somalians, Palestinian, and Lebanese. The laborers are much better at speaking English than we are at Arabic. Most of our translation problems are taken care of by our able labor boss, Said Ahmed Rashidy.

Working seven days a week without relief made our Christmas rest break most welcome, and money was found to be no object. Party Chief Calledare and Drillers Spurio and Mantini went home to Pescara, Italy, to spend the holidays with their families while the single men enjoyed Beirut, Lebanon. After one week, however, we left Beirut tired, broke, and happy that the next rest break would not come for another three months.

The seemingly endless working days have been somewhat lightened by the purchase of a TV for the crew. Reception is from both Kuwait and Abadan (Iran). English-speaking programs are regularly observed, but Arabian dancing runs a close second. Our best entertain-

at the same time preserving the traditional Arab and Moslem character of the community.

In 1951 Shaikh Abdulla inaugurated an impressive program of public works and educational and medical developments, which is quickly turning Kuwait, in this respect, into one of the best planned and equipped countries in the world.

One of the first problems that Party 95 encountered were restrictions placed on working in north Kuwait due to political friction with Iraq. Each member of the crew obtained a special permit to pass the checking stations on the way to the prospect. Also, the tops of all vehicle cabs were painted to show identification to any patrolling military planes.

With our equipment and supplies in order and the proper licenses and registrations obtained, Party Chief William C. Calledare led us to our first camp site, which was located near Subiya, 60 miles northeast of Kuwait (city). Although this is a camp job, it is unique that this first move was the farthest we would have to be from our main office in Ahmadi.

When our marsh buggies and other swamp equipment arrived a month later, we immediately switched from trucks to initiate work in the coastal lowlands. A large
ment is still that of home movies, which are shown under the technical direction of Howard Crider, Jim Moore, and Charlie Martin, who together have invested in a projector. Jim Moore usually has to narrate his films as many of his movies were originally taken with lens cover on. Most of the crew have purchased transistor short-wave radios as they are inexpensive here in Kuwait. Throwing horseshoes is the main outside sport if one cares to challenge the champion duo of Mantine and Spurio; and to settle the dust of the arguments, an “Eastern Hemisphere Championship Tournament” was grimly fought. The winner, but yet disputed, was the combination of Carmine Mantini and John Clingan. Runners-up were James Moore and Elio Spurio. Undisputed title of “lousiest” went to the duo of Howard Crider and George Vorgel.

Our two computers, Bill Goudy and Jim Scott, stay in Ahmadi, which is located 20 miles south of Kuwait town. Here by our client’s headquarters they have all the modern conveniences and recreational facilities, and both agree that they never had it so good.

Party Chief Bill Caledare was pleased to announce that everyone eligible on the crew received a Safety Award for the past year. The best safety record on the crew is held by Charlie Martin, who received his 13-Year Pin. With the popping of champagne corks, congratulations were extended to these men.

PARTY 54—MIDLAND, TEXAS . . .

Virgie Bryant, Reporter
Ken Bryant, Photographer

A cheery hello from the weary travelers of Party 54. It seems that it is the same old crew, dressed up with only a few new faces but with a new location.

Since last reporting, Party 54 made a 35-mile move from Odessa to Andrews, Texas. Actually, most members of the clan were happy with the change (after locating housing, that is). Apparently we are all country folks at heart! All were happy to give up the big city life in Odessa for the smaller and more friendly town of Andrews.

We had a pleasant surprise while in Andrews. Our gypsy friends, the personnel of Party 19, were in town for two months. The coffee consumption went up 100% during that time.

As usual in doodlebugging, good things must come to an end, and after 10 month in Andrews (that’s a record for this reporter) here we are in Midland. At this time we are in rather a state of confusion looking over a new prospect, house hunting, and also locating the closest of numerous city playgrounds and swimming pools for our vacationing school children.

PARTY 20—NEW ORLEANS and GRETNA, LOUISIANA . . .

Don Gardner, Reporter

The “Mosquito Capital of the World,” the marshes south of New Orleans and Party 20’s current working area, has brought some unusual experiences to the crew. One such event has Observer Don Meej considering taking up alligator hunting. Recently one of the swamp- buggies drivers caught and skinned one after a foot-race along a canal. He got the “gator,” plus a nasty whack alongside the leg, but was well repaid for the trouble. Alligator hides are worth $4.00 per foot.

Before our move to New Orleans and Gretna, the men and their families had a get-together at Lake Shelby, near
Hattiesburg, Mississippi. The combination of large, charcoal-cooked steaks, plenty of refreshments, boating, swimming, and water skiing are hard to beat. Don Meeh brought his boat and, although a good skier himself, could never keep “first-timer” Don Gardner above water more than a few seconds. (No pictures enclosed, thank goodness!)

Party 20 men include Party Chief J. B. (Jim) Arledge, Computers Don Gardner and Joe Boudreaux, Party Manager John Cubley, Observer Don Meeck, Assistant Observer Jim Monsey, Drillers Harvey Hearn and Leo Ivy, Surveyor Pat DeBrow, and a group of local hires. Now you know where these Westerners are.

We are hosts also to three summer hires: John Mireur, from Sugarland, Texas; and Bijan Mohajerina and Josef Biglia, both from Iran. Bijan is a 1963 graduate of McNeese State College, Lake Charles, Louisiana, with majors in math and physics. Josef is a student at the University of Alabama, studying to be a doctor.

PARTY F-63—TRUCHE, BRITISH COLUMBIA...

LEN SIDEROFF, Reporter
KEN DOBSON, Photographer

Truch, British Columbia — a hunting lodge, service station, cafe, and post office — is located at Mile 200 on the Alaska Highway and is the current “home” of Party F-63. Its motel provides first-class service to many Canadian and American tourists who, each summer, listen to the call of the North.

The owner of this small but prosperous establishment is one of the best outfitters and guides in the region. His hunting expeditions into the nearby Rocky Mountains have resulted in record trophies of grizzly, caribou, and mountain goat worthy of mention in the Boone and Crockett Club.

Left—Helper James Kennedy shows “perfect form” in picking up a Party 54 side cable. Center—This shot can only be titled “The Thinker.” Party 54 veteran Shooter Dick Rogers serves as record dryer to Observer Billy McNew (in truck). Right—Party 54’s “jester,” Helper Danny Hallbrook, shows off his “rattler for the day.”

While most of the crew are content to confine their exploration to that of oil, Nick Gooliaff, our junior observer, maintains that “that’s gold in them there hills” and in his spare time pans gravel in nearby stream beds.

Nick’s staunchest supporter in his as yet fruitless search is our “cat” operator, who was with us in our last year's operations in this northern bush country. Approximately half of our line is along previously cut trails, but he gets his share of spine-tingling chills putting his machine up sliding hills and sharp inclines, through muskeg holes cutting the new line, and doing a good job.

The ten men who comprise the crew are endowed with varied skills and ingenuity. Ken Dobson, our party man-
ager, is also surveyor. Rodman duties are performed by anyone who is handy, usually Erich Richter, our mechanic and supply man. Jock Coul is chief observer, and C. M. (Sandy) Larson is shooter. The drill and water truck are contract units mounted on tracks. Len Sideroff, cook, keeps the “inner man” content with his good food, as well as performing other camp chores.

This year we were given a modern new camp, the original fold-a-way type, mounted on tracks rather than bombardiers. We are now able to go over bigger and steeper hills — and get into bigger and wetter holes. Camp is moved every other day, a few miles at a time. Yes, it does get monotonous.

In two more days, however, we leave for a long-awaited time-off period, after 45 days of work. Our personnel carrier leaves Sandy and Len at Valleyview, Ken at St. Albert, and Jock at Edmonton. From Edmonton Erich flies on to Calgary, and Nick, the only single man on the crew, to where his fancy dictates (where the girls are).

Once home, we pick up our lives with our families where our last “time in” interrupted them. Our neighbors look askance at us for living this life of a modern-day pioneer; but to these tracked-unit operators, the bush is a challenging place to work and it is work that reaps satisfaction.

Greetings to all Westerners from Party F-63.

PARTY 37—LYMAN, WYOMING...

JOHN GRAY, Reporter
BILL ZALDIVAR and JOHN GRAY, Photographers

After staying almost a year in the Big Horn Basin, Party 37 left Cody, Wyoming, on May 4 and moved south for a new job. This prospect is located in the southwestern part of Wyoming near the little town of Lyman — population 400. Party Chief Steve Winborn and Party Manager Ed Planck stayed in Cody to tie up the loose ends of the old prospect and then moved to other assignments in Montana. The crew was met in Lyman by Party Chief W. H. (Bill) Young, who was only a week removed from the land “down under” — Australia, that is.

Lyman is situated on the old Mormon Trail, approximately 120 miles east of Salt Lake City. To the south is the very picturesque Uinta Mountains, with snow-capped
peaks well above 13,000 feet. Fishing streams are abundant as the Blacks Fork and the Smiths Fork Rivers run near here. Also to the south in these same Uinta Mountains is Party 37's field operation. Observer CARL SIVAGE can be found laying out spreads and shooting holes that Surveyor MAX STEWART laid out. Although beautiful, these mountains are also rugged. According to Shooter HOWARD KITTLE, it helps to be about half mountain goat when laying out the cables.

Before we left Cody, someone told Helper DON ERWIN that two could live as cheaply as one; and acting upon this startling bit of information, DON persuaded MISS JANICE MILLER to become MRS. ERWIN. Congratulations to DON and JANICE.

CARL SIVAGE was a bachelor of sorts for a few weeks until wife EVELYN and son CARL, JR., moved down from Cody. CARL, JR., is working on the crew for the fifth straight summer. This fall he will return to college, where he is a pre-med student. Computer JOHN GRAY also had a lot of time on his hands when his wife ANITA and daughters JUDY and LINDA spent a six-week vacation in Texas.

Chief Computer BILL ZALDIVAR has been practicing to become the fastest gun in the west since the purchase of a new Ruger six-gun. Seems he hopes to take over one of the leading spots on "Gunsmoke" soon. (Doc or Chester?) Helper RON SANDE apparently enjoys Lyman very much. He finds the night life somewhat stimulating and has made some very close "friends." JERRY TAYLOR and brother BOBBY are two additions to our crew from Lyman.

Golf, being the popular sport that it is, can be rated as a favorite among many of the people on Party 37. Among these are BILL YOUNG, MAX STEWART and wife MARY JANE, and CARL SIVAGE. At present no public links can be located near Lyman; however, much reconnaissance work is being done in hopes of finding one.
PARTY 68—BUENA PARK, CALIFORNIA...

ED GRACZYK, Reporter-Photographer

Disneyland, Knott's Berry Farm, Movieland Wax Museum, the roar of the freeways, many shipping centers, many golf courses, many bowling alleys, a choice of apartment houses, the smog, and the Los Angeles area — life of Party 68 men and families.

The city council meetings and the waiting; the powder storage, the fire marshal, the fire marshal permits, the fire marshal inspections, and the limitations; the freeway permits, the town permits, the railroad permits, the individual permits, and no permits — life of Party Chief GEORGE R. BYNUM and Permitman DAWSON (SLIM — "GETTING SLIMMER") EWERT.

The shuffling, staring crowds, the vibrating autos, the stolen jugs, the moved group stakes, the fascinating anatomical figures floating by, and the deep, very loose fill — life in the field.

Still lost somewhere on the freeways — Shooter MELVIN (PETE) RIX.

Peace and tranquility — gone.

Barbed wire fences — gone.

Variety — ever present.

Party 68 was led forth into this metropolis of red tape, confusion, and fees by its capable party chief, GEORGE BYNUM. Second in command of the office is the Australia rebound, ROYALL FRAZIER; and at the bottom of the office "totem pole" is the reporter, ED GRACZYK.

The people, the problems, and the scene have changed. In our last area we were bulldozing our way through; here we are trying to shoot up freeways. In that same previous area, Lompoc, California, we were often awakened by the rumble of missiles gliding into space; here we have relatively ancient helicopters lumbering about. Here and there, this and that, that and this, sooner or later something to soothe and at times irritate any temperament. For example, Observer JACK LITCHENBERG and Driller HOWARD QUAM and respective families are entertained nightly by an aerial display of fireworks from nearby Disneyland while the reporter and his recently enlarged family (7-pound, 2½-ounce CALLEN WARD) are hummed to sleep by the near-

by Santa Ana Freeway. Driller Warren Tufte has the hills of Taft through which to roam—he is on vacation.

Speaking of Taft, Party 68, since working in that area some months ago, has filled its ranks with former residents of that ancient oil capital. As the summer grows warmer, so swell the ranks of Party 68 with Taftians. They must be trying to escape high degrees of desert temperature to bask in the ever-enfolding smog of Los Angeles. Steve Lewis, “chief seismometer placement engineer,” was the first Taftian to join the crew. Alan Huey, rodman and helper, came to us in Lompoc. Later Helpers Dwight Canady and K. D. (Skeeter) Foust joined Party 68.

Though we have not been writing on the subject of fathers, we shall—and report that we have acting Junior Observer Bill Hill finding it difficult to believe that come July he will be one.

Whether Louis Bollinger likes the L. A. area or not is unimportant because Warren Tufte is on vacation and Louis finally has the drill all to himself. Helper Carl Willet who came to the crew from this area has finally made it back to his wife. Surveyor Gerald Nelson has quietly slipped off to Smog 9 for a two-week vacation.

Soon after coming to Buena Park, Supervisor John Adams asked if any nickels had to be put in parking meters before the recording truck could be set up for a shot!

**PARTY 36—ANCHORAGE, ALASKA . . .**

ROY MORRIS and C. L. SMITH, Reporters

CHARLES METZGER, Photographer

Defense Department “Whiz Kids” who plan and direct amphibious operations for the military could take notes from the operations of Western’s Party 36. On May 18, after weeks of careful planning by Supervisor Bill Rosser, Party Chief C. Q. Quin Williams, and Party Manager Roy Morris, Party 36 returned to the Alaska Peninsula. Within 24 hours after word was received that the ice had broken in Ugashik Bay, personnel were flying from Anchorage to commence operations.

Moving in the equipment was accomplished in a far more efficient manner than most military operations. A barge that had been standing offshore waiting for breakup nosed into the shore on the Pilot Point side of the bay and discharged a cargo of tires for the marsh buggies waiting at Pilot Point. The barge then reversed and moved across the bay to unload the rest of its load on the prospect side of the Ugashik River. Driller Ollie Krein and Mechanic Chuck Metzger fitted the tires to the marsh buggies from the winter camp at Pilot Point.

The difficult part of the move-in lay ahead. Before reaching the first shot point the entire crew, with additional supplies, had to be ferried from its winter camp to the work area across the Ugashik River. At the point of crossing, the Ugashik is 1/4 miles wide. High winds often raise 4-foot waves in the center, and the water level changes 20 feet twice each day with the tides.

The crew battled high winds, mud, and tides. Many of the buggies were carried across the river by the supply barge, but mechanical failure stopped the barge before the operation was complete. An attempt was made to tow the buggy trailers across the river with the buggies, but this was abandoned when a combined tow was almost overturned by a sudden gust of wind. Some of the buggies crossed under their own power, floating high on their enormous tires. The remainder were towed across by a chartered fishing boat. Supplies were put into the boat and the buggy trailers by the men and then laborously unloaded at a central supply dump or positioned at smaller, strategically-located resupply points throughout the work area. From the air this operation resembled a convention of beetles from Mars, with the yellow cabs of the buggies sprouting radio antenna in all directions. (See picture.)
Surveyor Del Stephens staked the first location, and the crew was “on the job.” Driller John Orth and Helper Chacon Shannon raised the mast and began making hole, and Driller Fay Gorrod and Helper George Rice moved to the next hole. Recording started the second day. Helpers Carl De Priest and John Kuarfard and Assistant Observer Kent Logan fought their way through the marsh laying out cables and hooking up jugs while Observer Russ Kaminsky and Shooter Paul Pederson tested radio communication between the recording and shooting units. (Party 36 undoubtedly has more radios in operation than any other seismic crew in history. Ten receiver-transmitter units are in use on the crew.) On May 23, after weeks of planning, co-ordination, and plain hard work, the first shot was detonated. Tangible results were being returned to the client in the form of seismic records.

“Home” to Party 36 is an amphibious trailer camp consisting of kitchen and dining trailers, several sleeping trailers, and a shower trailer. Camp etiquette requires that hip waders and muddy rain pants be removed before entering the dining and sleeping trailers. Cook Frank Taylor operates the kitchen with the help of E. V. Smith. The two use approximately 100 pounds of groceries each day to prepare meals and snacks for the crew. Frank estimates that at least 13 pounds of these are used to satisfy the cookie requirements of the crew. Most supplies must be flown in from Anchorage. At various times these have been transported by DC-3, DC-4, L-180, L-185, Widgeon, and Goose. After being unloaded at the central supply dump, the supplies are hauled to camp location by Paul Schlemmer.

Field operations on the Alaska Peninsula present all the problems encountered normally in doodlebugging and a few that are unique to the Peninsula. The solutions that have been reached by members of Party 36 are equally unique. For example, almost every surveyor has had the experience of crossing a stream and “hanging up” on a mud bank out of winch-line reach of either shore. Del Stephens and Mike Gross, however, are among the few who have been able to wait for 30 minutes until the incoming tide floated them off the bar and onto the bank.

Helper Bob Craig has found that walking on the spongy muskeg along the Ugashik requires an entirely new technique. If any Westerners in the “South 48” would like to learn this, he recommends that they try walking on a trampoline wearing hip waders and rain clothes.

Computer Rodney Kraus and Chief Computers Bob Hail and C. L. Smith have organized a softball team from the office crews of Party 36 and Party 17. The first scheduled game will be with an oil company team as soon as the team is whipped into shape.

Supervisor Bill Rosser is very busy with crews scattered from Port Moller to Umiat and, in addition, getting bids for the construction of Western’s Anchorage shops and offices. In spite of this, Bill took time one weekend to go bear hunting and help kill two black bears that were harassing a Boy Scout camp where his son Jerry was camping.

Left—Some Party 36 men gather to board the Widgeon that will take them to Anchorage for a break. They are, from left: a client representative, Helpers Bill McKenzio and Bob Craig, Party Manager Roy Morris, Chief Observer Russ Kaminsky, Helper Mike Gross, and Driller Fay Gorrod. Above—Roy is intent as he adjusts and listens to one of Party 36’s 10 radios the crew uses on the Alaska Peninsula.
EVERYONE LIKES A PARTY, and so have a party we did. Members of Party 65 converged and congregated in the banquet room of Cooper’s Restaurant, Ardmore, Oklahoma, for a well-deserved Safety Dinner and dance. The Oklahoma City office force was well represented by Host-Party Chief Ben and Brenda Langston and Computer Jim and Susan Mundy. Receiving Safety Awards were the following men: Observer N. D. Taylor, an 11-year medallion; Surveyor Don Watts, a 9-year medallion; Shooter Dale Morgan, an 8-year one; Assistant Observer Dan Shea, a 2-year medallion; and Driller Clarence Perryman, a 1-year award. Naturally, proud of their spouses and hoping that they would not be required to listen to any food-cooling speeches were the Mmes. Jeanette Watts, Hazel Taylor, Dora Shea, and Christine Perryman. Enjoying the after-dinner music were dancers Vauglin and Gail Bryant, Henry Ross and Sharon McGill, and Macey and Ruby Dart. Incidentally, Dale and Mary Jo Morgan were in neighboring Madill, Oklahoma, on their vacation from Party 21 and could not resist the prospect of a Safety Dinner.

New Western personnel on Party 65 include a transferee, a new computer, and two brand-new wives. The transferee is Computer L. G. Hawkins, who came to us from the Shreveport office and also brought his December bride, Pat. On December 22, 1962, in the Shreveport City Baptist Church, Miss Patricia Greer became Mrs. L. G. Hawkins. Ron MacGowen, of the Western Shreveport office, served as an usher.

Another new bride is Mrs. Henry Lee Ross, the former Sharon Ann McGill, who was wed in a beautiful double-ring ceremony May 25 in the Oakland Church of Christ, Oakland, Oklahoma. Following a week-long honeymoon in Dallas, Texas, and other parts of East Texas, Mr. and Mrs. Ross joined the field crew of Party 65 in Ardmore. Last, but not forgotten, is our new computer, R. L. Griffin, a 1960 geology graduate of the University of Oklahoma, who lives in nearby Yukon, Oklahoma.—J. B. Mundy.

MIDLAND WESTERNERS have been even more “on the go” than usual. Observer Supervisor W. T. Ross, at this writing, is in Mississippi after a short stay at home following his return from England and Denmark. Boats were outfitted at London and then proceeded to Denmark. Actually, it is more news-worthy when Ross is at home than when he is away as he is gone so much!

The Jay Fraizers took their first boating-camping trip of the season Memorial Day weekend when they went to the Highland Lake area. Then Shop Supervisor Jay spent about three weeks or so lending an assist in the Shreveport shop. One weekend while he was away, wife Eloise went to El Paso to visit their daughter Beverly and family.

Mike Shoup, son of Supervisor George J. and Betty Shoup, is enrolled for the summer term at the University of Texas in Austin. He recently completed courses at Odessa Junior
College. George and Betty spent a weekend in June visiting Betty’s sister and family in Anthony, New Mexico. In case you have not heard yet, they are now grandparents for the third time, daughter Nancy having presented them with the third little boy, on April 13. Incidentally, George had to miss the christening of his third grandson because of a trip he had to make to Trinidad, where he helped get a crew under way. We understand that Fred Di Giulio arrived there a day or so before George left; but he, too, is back in the States and has made at least one trip to the Midland area to visit his crews, one of which recently moved from Andrews to Midland. Fred told us that his oldest son, John, who has just completed his first year in college, is “doodlingbugging” in the bay area this summer.

Linda Wardell, who has just completed her first year in Centenary College in Shreveport, Louisiana, is spending the summer vacation here with her parents, Dick and Mary Wardell, who made a trip to Shreveport over the Memorial Day weekend to bring her home. While here, Linda is using a part of her spare time taking a course in art. Mary, too, is busy, doing a little “brushing up” through a correspondence course. Mary, as many of you may know, taught in an elementary school in Midland last term and plans to do so again, provided Western does not move them away from Midland. The Wardell family manages a trip to Lubbock frequently to see Mary’s parents and other relatives.—Eloise Fraizer.

NOW SETTLED in Natchitoches, Louisiana, which is located on the Cane River and surrounded by several beautiful lakes, Party 52 field crew has found a “fisherman’s paradise,” and most of the men can be found on one of these lakes when they have a free weekend.

Party Chief Tom Toschlog, wife Carol, and children, from Jackson, Mississippi, were visitors in Natchitoches over a weekend, and the crew enjoyed cake and coffee with them at the home of Party Manager and Mrs. C. N. Hardin. The girls honored Carol with a shower as “ole Mr. Stork” is expected to arrive at the Toschlog residence in September.

Burkett and Lea Neely returned to Party 52 from a leave of absence and Mississippi Southern, where Burkett is studying biology. He says he is learning more every day about such plants as poison ivy. As they leave again in the fall for another school term, our best wishes go with them, especially with Lea, as she waits for the arrival of the “wee one,” due in September.—Audie Hardin.

DEATH TOOK one of Western’s first employees June 7 when John Bauernschmitt passed away, after a short illness, in a Los Angeles area hospital at the age of 62. John joined Western in its earliest days as a shooter—and a good one—for several years. More recently John, a native of Minnesota, worked in the Los Angeles body shop as a welder. He was a true Westerner—loyal, conscientious, capable, and a good husband and father. John and his wife, Muriel, made their home in Lynwood, California. In addition to Mrs. Bauernschmitt, John’s survivors are a daughter, Mrs. Paula East, and two grandchildren. The friendly “veteran” is missed by all Los Angeles Westerners, who extend their deepest sympathy to his widow and family.

MONOTONOUS IT MAY SEEM; nevertheless, an honor is not to be hidden or treated lightly. Yes, the Western Profile has done it again, won another one! In a contest that drew close to 1,000 entries from the United States, Canada, and South America, our Profile received a Merit Award Certificate given to the finalists in the category of internal (employee) magazines of under 5,000 circulation. The contest was sponsored by Edward Stern & Company, Inc. (a large Philadelphia printing firm) in cooperation with New York University and the American Association of Industrial Editors.

The specific elements for which all entries were reviewed included: (1) design and layout, (2) typography and effective use of graphic processes, and (3) inventiveness and originality. Profiles entered in the contest were the March, June, and September 1962 issues. They were judged by James L. Harrison, U.S. Public Printer; Otto Storch, art director of McCall’s magazine; and Hillier Kriehbaum, chairman of the department of journalism of New York University.

WESTERN PROFILE
HAVING FINISHED her first year of college work with a 3.8 average for the year and straight A's the second semester, Carolyn Jones has been awarded a full scholarship for academic achievement at Louisiana Polytechnic Institute. She was able to maintain her high average and grades while working part time in the library and assisting one of the professors in the English department. Also, she was a member of the Dormitory Honor Council. Carolyn is the daughter of Dot and Ray Jones, Shreveport playback center.

WESTERN CHILDREN in the Canary Islands have learned the language and customs of the people here so well that they are able to take part in the Islands' activities, thus greatly enriching the children's education during Party 98's stay here. For example, Rebecca Bouchillon, 9, and Cynthia Davis, 7, study Spanish dancing with Trina Borrell, one-time prima donna of Spain, and this summer appeared on stage in two recitals. Rebecca is the daughter of Chief Observer Thomas C. and Mary Ruth Bouchillon, and Cynthia's parents are Driller Floyd and Gwen Davis.

Also, Cynthia and Floyd, Jr., 14, study Spanish music with Don Antonio Medina and have been on stage displaying their ability on the timple and guitar. At this recital Cynthia and the Bouchillons' 7-year-old twins, Gary and Cary, were among those in the Spanish language class who sang cowboy songs — in Spanish, of course. — Gwen Davis.

A TRACK SCHOLARSHIP to Southeastern Louisiana College has been awarded to a young Westerner, Colden (Butch) Jones, following consideration of several outstanding track men. Butch, the son of Mr. and Mrs. Colden Jones, Party 72, New Orleans, and a recent graduate of East Jefferson High School was the winner of the outstanding track athlete honor for three consecutive years. Although his major sport achievements have been in track, he also has lettered in football, basketball, and baseball. — Donald R. Beeler.

Geophysics students from the University of Rome look at a record just taken by Western Ricerche's Party F-79 near Italy's Adriatic Coast. Observer Guido Del Monte is holding the record, and standing apart from the group is Surveyor Alberto Chiar.

PUBLISHED in the April 1963 Geophysics was a paper by Mark Holzman, Western research engineer in the Los Angeles laboratory. Titled "Chebyshev Optimized Geophone Arrays," Mark's work was termed "... a significant contribution to the theory and practical design of seismometer arrays" by the editor and staff of this official magazine of the Society of Exploration Geophysicists.

The article outlines a new short-cut method for computing the characteristics of a "tapered spread." Tapered spreads are used to reduce drastically the amount of horizontally traveling seismic noise picked up on a seismometer spread.

Before joining Western's research staff in 1947, Mark spent several years in academic and research work, including two years with the California Institute of Technology. After he received his B. A. degree from New York University, he did graduate work in mathematics and mathematical physics at both the University of California in Los Angeles and the University of Southern California.

Mark is currently a member of the SEG Reviews Committee, American Physical Society, American Mathematical Society, Mathematical Association of America, Society for Industrial and Applied Mathematics, and The Philosophy of Science Association.

A GROUP of engineering students from the University of Rome, members of a class in geophysics conducted by Mr. Conforte, visited Western Ricerche Geofisiche in late spring. After spending the morning in our laboratory and shop at Pescara (Italy), they traveled 40 miles farther south on the Adriatic Sea coast to Vasto to call at the Party F-79 office. From there Party Chief D. W. Scharf took them to see a geophysical field crew in operation. The location was in the hills bordering the Sangro River, about 12 miles inland from the coast. — Dave Scharf.

JUNE GRADUATIONS brought pride to three of Western's Los Angeles laboratory families, the Niehenkes, the Glens, and the Towns.

A college graduate was Margo Niehenke, daughter of Ob-
server Supervisor Ben and Leona Niehenke. Margo, who majored in accounting, received a bachelor of science degree from the University of California at Los Angeles. She was a member of Phi Chi Theta, national honorary women's business fraternity; secretary of Kappa Sigma Alpha, accounting society on campus; and a Prytanean, an honorary group for women in the upper division, membership for which includes service, as well as scholastic, achievements. Before she even had her degree, Margo was hired, in April, by Haskins & Sells, a large and well-known accounting firm. She started her new job September 3. During the summer Margo was back at the University beginning work for her CPA and will continue these studies in night school while obtaining the two years' on-the-job experience that is one of the requirements for the title of Certified Public Accountant.

Sixteen-year-old Gwen Glenn, daughter of Senior Seismic Engineer Hardy and Gloria Glenn, received three honors in addition to her diploma when she was graduated from North Torrance High School. One was a scholarship to the University of Southern California. Because this is deferrable and because Gwen is rather young to enter a large university, she will attend El Camino (California) Junior College for two years and then take up her USC scholarship as a junior. Her second honor was a scholarship to the Flavio Beauty College. She started this course in July and hopes to complete it at evening classes after she starts in September at El Camino. The third was a Certificate of Merit in Business awarded by the Bank of America. Only the top 1% of a class are even considered for the Bank's Certificates, and Gwen was chosen from the three nominees for the business certificate.

A city boy who wants to be a farmer, Walter Towns received his diploma from Cleveland High School in Reseda, California. The son of Senior Shop Foreman Mack and Eletha Towns, Walter started his college career at Pierce Junior College in Woodland Hills, California, this summer. Not only did he attend classes, but also he worked in the college's poultry division, tending chickens and cabling eggs. A lover of the mountains and the open spaces, Walter took an agricultural course in high school and is continuing it in college, with plans to follow in his grandfather's footsteps and be a farmer.

PARTY 75-6 HAS NEWS of graduates (of various ages) and other important events this summer. Ann Buckingham, daughter of Party Chief W. T. (Buck) and Lou Buckingham, graduated from East Jefferson High School recently in New Orleans. She intends to continue her studies at Louisiana State University in New Orleans and pursue a career in nursing. We all wish Ann the best of luck in her future.

John White snagged a 6½-pound bass while fishing in the marshy area in the outskirts of New Orleans.

Kay Riddell, a newly hired employee in New Orleans, has been doing a tremendous job in track and field competition in New Orleans. She holds a number of records in the women's competition here, one being that she broke her own record in the 50-yard dash, with a time of 6.3 seconds.

Cathy Nicholls, daughter of Bob and Catherine Nicholls, graduated from grade school in June. Not only did she receive very good grades in her grade school career, but she received an award for perfect attendance for three years. She will attend Archbishop Chapelle High School for Girls.

Howard Dingman, supervisor in New Orleans, was recently installed as district representative in the Southeastern Geophysical Society, the local chapter of SEG, for the year 1963 to 1964. Also regarding the Dingmans, W. T. Buckingham reported to us that Howard and Christine finally succeeded in graduating their fourth little girl from kindergarten and that Howard says this is a milestone in his career.

Aart de Jong, also a supervisor in New Orleans, is the general chairman of the 33rd annual Society of Exploration Geophysicists convention, to be held in New Orleans October 22 to 24, 1963. About 1,500 delegates are expected to attend the gathering.—W. P. Frommeyer.

Among the young Westeners who were graduated this June were these four, whose pictures were obtained by some enterprising PROFILE reporters. Details of these graduates' schools and plans are in the stories above.

ANN BUCKINGHAM
New Orleans, Louisiana

WALTER TOWNS
Reseda, California

GWEN GLENN
Torrance, California

MARGO NIEHENKE
Los Angeles, California
30 YEARS
McGrady, Dupree
Salvatori, Henry
Walling, Dean

22 YEARS
*Davis, Floyd E.
*Stave, Carl B.
Skaggs, Willis M.

21 YEARS
*Gable, Joseph T.
Holder, Homer C.
Putnam, Nuel L.

20 YEARS
Brown, Buran W.

19 YEARS
Buckingham, Walter T.
Powell, Richard C.

18 YEARS
Aronov, Norman
Hird, A. E., Jr.
Sickles, James W.
Taylor, James M.
*Young, William H.

17 YEARS
*Dungan, Wilton B.
Ferrair, Leo
Hancock, John W.
Ivy, James L.
Murphee, Harold F.
*Shat, Hon
*Smith, Jennings G.
Thornhill, Delmas C.

16 YEARS
de Jong, Aart
Holzman, Mark
Rogers, Richard
Williges, W. A.
*Zaldvar, William V.

15 YEARS
Calladate, William C.
Flord, E. E.
Hoyt, Leonard M.
*Johnson, J. Harvey
Kirst, William J.
Ross, Joseph C.
Savit, Carl H.
Winborn, Stephen A.

14 YEARS
Cramer, Neal P.
*Rau, Adolf
*Rodgers, Charles E.
Taylor, Dalton

*Interrupted Service

13 YEARS
*Bender, Edward
*Long, Richard L.
Robinson, Jack N.
Smith, Willis D.

12 YEARS
Harris, John
*Kaminsk, Russell A.
Kawabe, Eugene
*Klinkert, Eugene J.
*Miller, G. O.
*Moore, James A.
Quinlan, Benny
Robinson, James E.
*Sideroff, Leonard
*Treadway, W. L.
*Williams, Calvin C.

11 YEARS
Baker, Zane H.
Butler, Huey H., Jr.
*Goff, Bruner E.
Jare, Bernard
Morgan, D. D.

10 YEARS
*Bing, Charles E.
Carter, Robert A., Jr.
Coker, Roger M.
Evans, Rose W.
Jones, Glenn S.
Little, George E.
*Meek, Don
*Nees, James V.
O'Leary, Timothy D.
Saller, Byrd T.
*Samwell, Maurice O.
*Squires, James R.

9 YEARS
Budd, William R.
Crane, F. J.
*Good, Donald J.
*Goodgame, James O.
Jakubowski, George A.
*Kitchrist, Ray
Neison, Louis G., Jr.
Schueler, Paul A.
Scott, Carl W.
Southwick, Hillman
Steele, E. R.
tom Dieck, Detmar

8 YEARS
Biggs, Paul G.
Brittin, Robert M.
*Fehmoch, W. G.
*Handbough, C. C.
*Hearn, Harvy
*Holt, Dewey J.
*Hull, James S.
Le Blanc, Raymond
Lee, G. K.
McDaniel, Gene E.
Smith, Chester D.

7 YEARS
Barksdale, Walter R.
Bonderson, Merrill
*Cherniak, William J.
Garner, Bernard L.
*Goodfellow, Nick
*Hammond, Jesse W.
Libert, William
Mantini, Carmine
McCoy, E. D.
*Neely, Burkett
Paddie, Louis
Steil, Marie T.
*Thomas, T. E. B.

6 YEARS
deGruchy, Jack G.

5 YEARS
Bennett, Thomas G.
*Brannon, Marcelle
*Deveau, Rui
*Hayward, Peter
*Regan, Michael
Swanson, Larry
*Warren, T. A.

4 YEARS
*Johnson, Lloyd
*Pederson, Paul
Roundtree, J. E.
Toschlog, Thomas A.

3 YEARS
Brinkley, J. L.
*Bryant, E. V.
*Champlin, V. J.
*Flom, Floyd
*Hunter, Elizabeth
*Kampe, Reins
*Mangum, Ed
*McEachern, A. C.
*McGill, R. L.
*Nanni, Raffaela
*Pilkinson, Lawrence L.
*Savaggio, Frances
Smith, C. L.
*Stevens, Gene M.
Taylor, James E.
*Weidner, Melvin I.
*White, Travis
*Willis, Diane

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FRONT COVER

Although this is definitely a slope, it is not the North Slope of Alaska. It does show, however, another type of rugged country with which Western vehicles and personnel have cope for many years, that of the northwestern part of the United States. This Western drill and water truck are crossing a small Montana canyon. The “road” is not a road at all but a trail especially bulldozed for the Western operation.—Photo by James C. Olson.

MARIANNE CLARKE, Editor

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In our complex world, the "born leader" isn't enough. He needs training so he will possess the knowledge, technical skill, and the culture and vision that distinguish the leader from the rank-and-file.

These assets are, for the most part, the product of higher education. In fact America must count on college-trained leaders to hold our position in many areas—in science and invention, in business, trade, and jobs, in our living standard and moral influence.

But there are danger signs. Higher education is in trouble—some colleges face shortages. The big test is just ahead when applicants at colleges will double. To maintain our world lead, we must maintain our colleges—with enough classrooms, laboratory facilities and competent teachers.

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