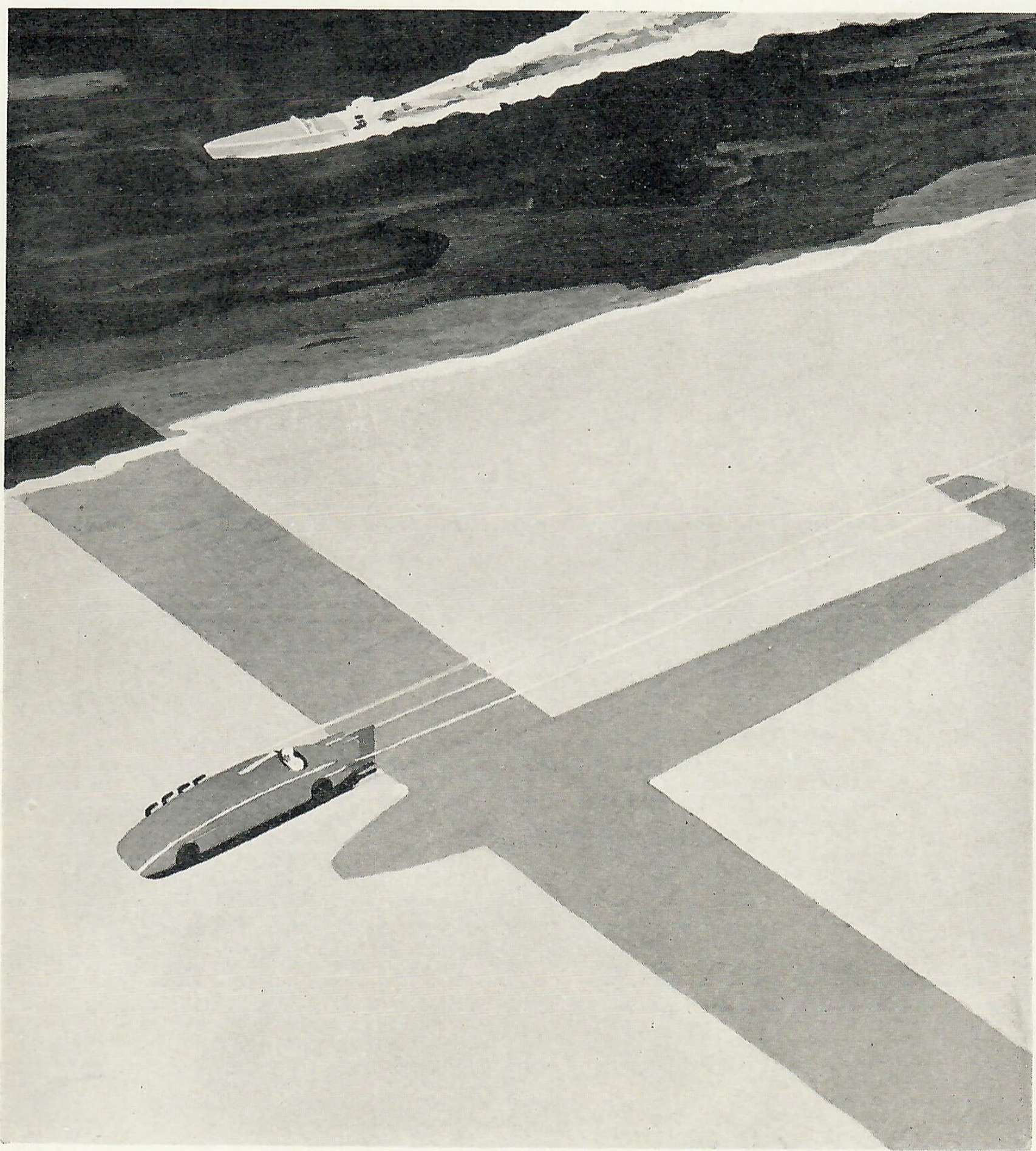


UNION OIL BULLETIN



MAY 1928

Records made with Ethyl



IN the air, on land and sea, Ethyl gasoline is the fuel used by those who make records. Lieutenant Webster used Ethyl in his seaplane last September when he won the Schneider Cup races at 281 miles per hour. Captain Malcolm Campbell used Ethyl when he set the new world speed record for automobiles at Daytona Beach by traveling at 206.9 miles per hour. At the same Daytona Beach meet, Frank Lockhart made unofficial records with his little Blackhawk car, fueled with Ethyl. Peter DePaolo, the 1927 A. A. A. Board Track Champion used Ethyl in every race he entered.

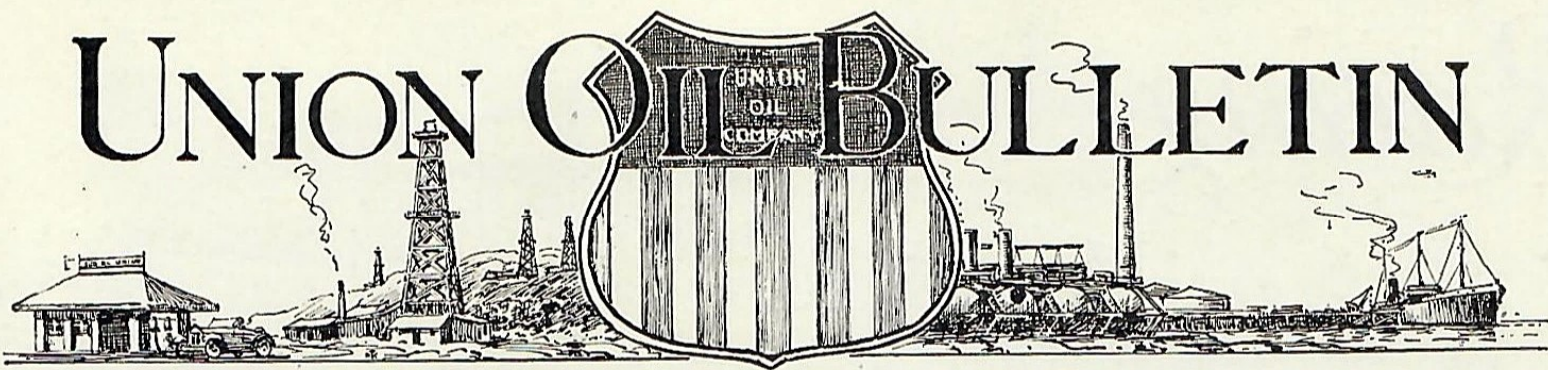
Ethyl is the modern fuel that revolutionizes the performance of *your car*. Try ten gallons of Union-Ethyl and see the marked improvement for yourself.

UNION ETHYL



UNION OIL COMPANY

UNION OIL BULLETIN



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VOLUME VIII

MAY, 1928

BULLETIN No. 3

PROFITS

IN any industry where realization on commodities is controlled by the law of supply and demand—and this includes all competitive endeavor—profits are limited by operating costs. When the return is less than the cost, that industry cannot long endure. Every organization in that industry strives to obtain an advantage over its competitors by lowering costs through more efficient methods of operation. After all, the crux of the situation is the value obtained by cash expenditures.

The American oil industry is now engaged in a cooperative effort to solve its own problems and to further improve all methods of operation. The American Petroleum Institute affords a medium for free exchange of ideas and information between executives and departments of all oil companies. Technical research problems are being studied under careful guidance and control. Committees are at active work in an effort to find means for more intelligent and economical development of oil lands and in a study of possible legislation which would afford greater freedom in cooperative control of production and distribution.

Economies resulting from work of this nature will benefit the industry at large and will tend to produce a healthy condition throughout. The degrees of efficiency in which new knowledge is applied will still leave one company better off than another. —E. W. CLARK.

Racing with ETHYL

By FRANK ELLIOTT, A. A. A. Race Driver

IT IS generally considered that the racing of specially built high-speed cars is at least partially justified by the fact that they serve as a testing laboratory wherein the ultimate value of the engineering fea-

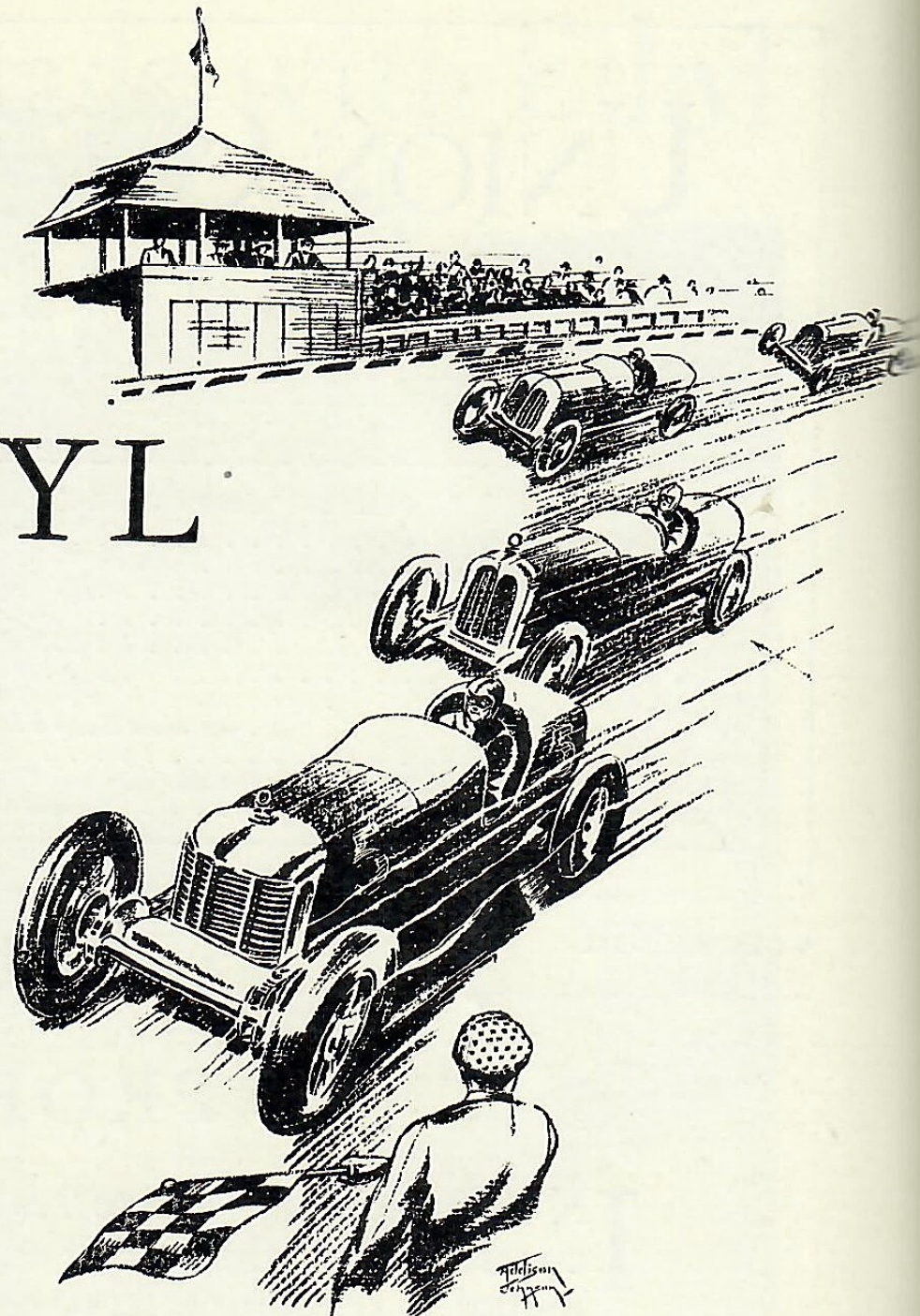


FRANK ELLIOTT

tures are measured. It might be mentioned that some of the conveniences and improvements which you now enjoy and which have passed through this ordeal of speed are balloon tires, four-wheel brakes, small high-speed engines, alloy pistons, special heat-resisting valves and spark plugs. Two features which are being very thoroughly tested in these cars and which we may see in our pleasure cars in the future are front-wheel-drive and superchargers.

High Compression Important

Perhaps the most important development which can be attributed to racing is the increase in the pressure to which the explosive gases are subjected before they are ignited by the spark plug. Real advances in this higher compression began with the discovery and development of a fuel which permitted its use. Since Thomas Midgley's discovery that the addition of tetra ethyl lead to gasoline permitted it to be used in

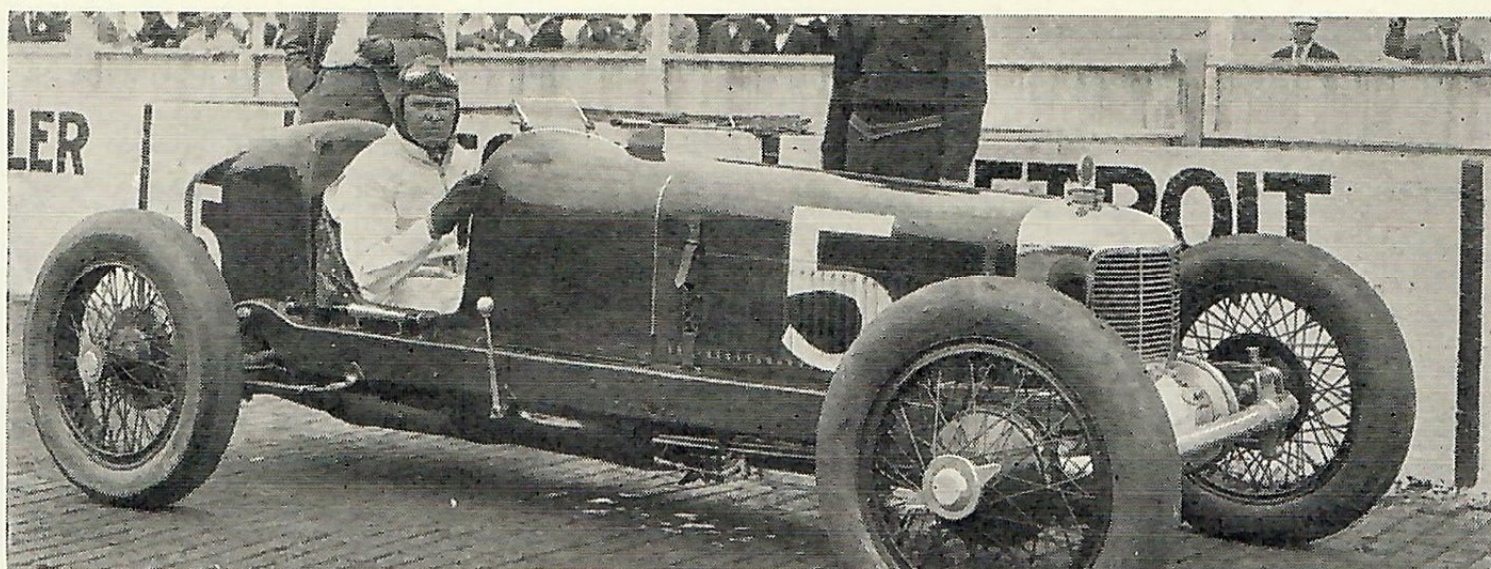


engines of much higher compression, the pressure in the supercharged engines of the race cars has been steadily increased until probably it is 180 pounds at the time of ignition, which would mean that the explosion pressure would be around 800 pounds. This accounts for the large output of horse power from so small an engine in comparison to our pleasure cars, which have an explosion pressure of from 250 to 400 pounds.

Tommy Milton First to Use Ethyl

To my knowledge the first use of tetra ethyl lead in race cars was in April, 1924, at which time Tommy Milton set two new world's records at Murroc Dry Lake, California, using gasoline treated with this chemical.

The following May at Indianapolis, Indiana, most of the drivers were approached to use it, but it was looked upon with some misgivings as to its efficiency. We were



Frank Elliott at the wheel of his front drive Junior Eight Special just before the 500-mile Indianapolis classic last year.

constantly being approached with new ideas to try out which sometimes proved quite costly as well as inefficient.

But after a few of the drivers had given tetra ethyl lead a trial and found that their engine ran much smoother and gained a few more revolutions, it was not difficult to get all of the best drivers to use it in this race. As a result, the Indianapolis classic of 1924 was won with Ethyl Gasoline, as well as every race and all major speed events since that time.

Supercharger Developed

It was not long after we had begun to use Ethyl Gasoline until we found that we could increase our compression and get still better results. By the time we began to install superchargers our compression had crept from 6 to 1 up to 8.5 to 1. All that was necessary with the 8.5 to 1 compression was the addition of sufficient amounts of tetra ethyl lead to eliminate detonation.

When we first used superchargers on our race cars we found we had greatly increased their volumetric efficiency, but our operating temperatures were raised to such a high degree that we burned holes in the pistons and sometimes melted the valves. By the addition of ethyl fluid to the gasoline we were able to eliminate this trouble. At the present time the race cars require several times the amounts of ethyl fluid than is required in the present day pleasure car.

A Diminutive Giant

A comparison can be shown by the performance of two cars in record runs last year. One had two large slow-speed engines, the other a small, high compression high-speed engine. The former was used by Major Segraves to set a new world's record of 203 miles an hour, and his engines had a displacement of 2600 cubic inches. With the latter, Frank Lockhart's speed was four-fifths as fast and made with an engine one-twenty-ninth as large. Ethyl Gasoline played a very important part in this performance.

Just this year a new record was made by Mr. Campbell of 206 miles an hour, using an engine not quite half as large as Major Segraves used. Mr. Campbell's engine had a compression ratio of 10 to 1 and Ethyl Gasoline also helped him to make his record.

Motor Car Manufacturers Ready

Now that we have a fuel that is truly an anti-knock fuel, it becomes necessary to educate the public of its value and how they can obtain the greatest efficiency out of their cars, *this* by the use of Ethyl Gasoline. The manufacturers are ready to build the type of engines which will give increasingly better performance with this fuel as soon as the public is willing to accept them.

CALIFORNIA OIL

A Glimpse of an Ever-Changing Picture

By L. P. STOCKMAN*

TREMENDOUS STRIDES have been made in the oil industry during the past decade, and while this period has been fraught with many vicissitudes due primarily to an abnormal production of crude



L. P. STOCKMAN

oil resulting from the discovery and successive development of a number of highly prolific new fields throughout the United States, achievements during the past ten years are little short of phenomenal. Research and exhaustive experimentation have resulted in improved methods of production and more efficient operation of refining units, but notwithstanding the rapid progress made to date the possibilities of the future are almost unlimited and it is needless to say that technologists will stimulate the production of both crude and refined oils by effecting a larger ultimate recovery of crude oil and increasing the efficiency of cracking processes and other refining methods. Artificial production methods, consisting of scientific application of the gas lift and repressuring operations, are coming into more general use, and while the introduction of dry gas or air into the oil-bearing formation dates back over a number of years the gas lift, probably the greatest single advance in recent production practice, is of comparatively recent origin. A combination of these two methods has proven exceptionally successful in several fields and as time goes on the independent

*Mr. Stockman is Chief Statistician for the Independent Oil Producer's Agency.

producer, like the major companies, will take advantage of this work, as the conservation and efficient utilization of natural gas is synonymous with increased economic production of crude oil and the elimination of waste. Union Oil Company was perhaps the first California concern to undertake conservation work on a large comprehensive scale, the activities of this company extending over a period of years. Union pioneered both gas lift work and scientific repressuring in California and the company's installations at Richfield, Huntington Beach, Brea, Olinda and Dominguez represent the first concerted attempt to utilize excess production of natural gas by reintroducing it back into the oil formation, both as a conservation measure and to stimulate the production of crude oil. These installations have been in constant operation for several years and the results obtained have been exceptionally gratifying. The Dominguez field is perhaps the best example of the efficacy of general conservation work, which includes normal development and the utilization of both gas lift and repressuring, and while a study would probably reveal similar favorable results in other areas, the outcome of this work in this district is more evident because the total field output does not reflect a false condition resulting from the flush production of new wells due to the fact that only a limited amount of development has been undertaken during the past few years as a result of the splendid cooperative efforts of producers to retard drilling until general conditions improve.

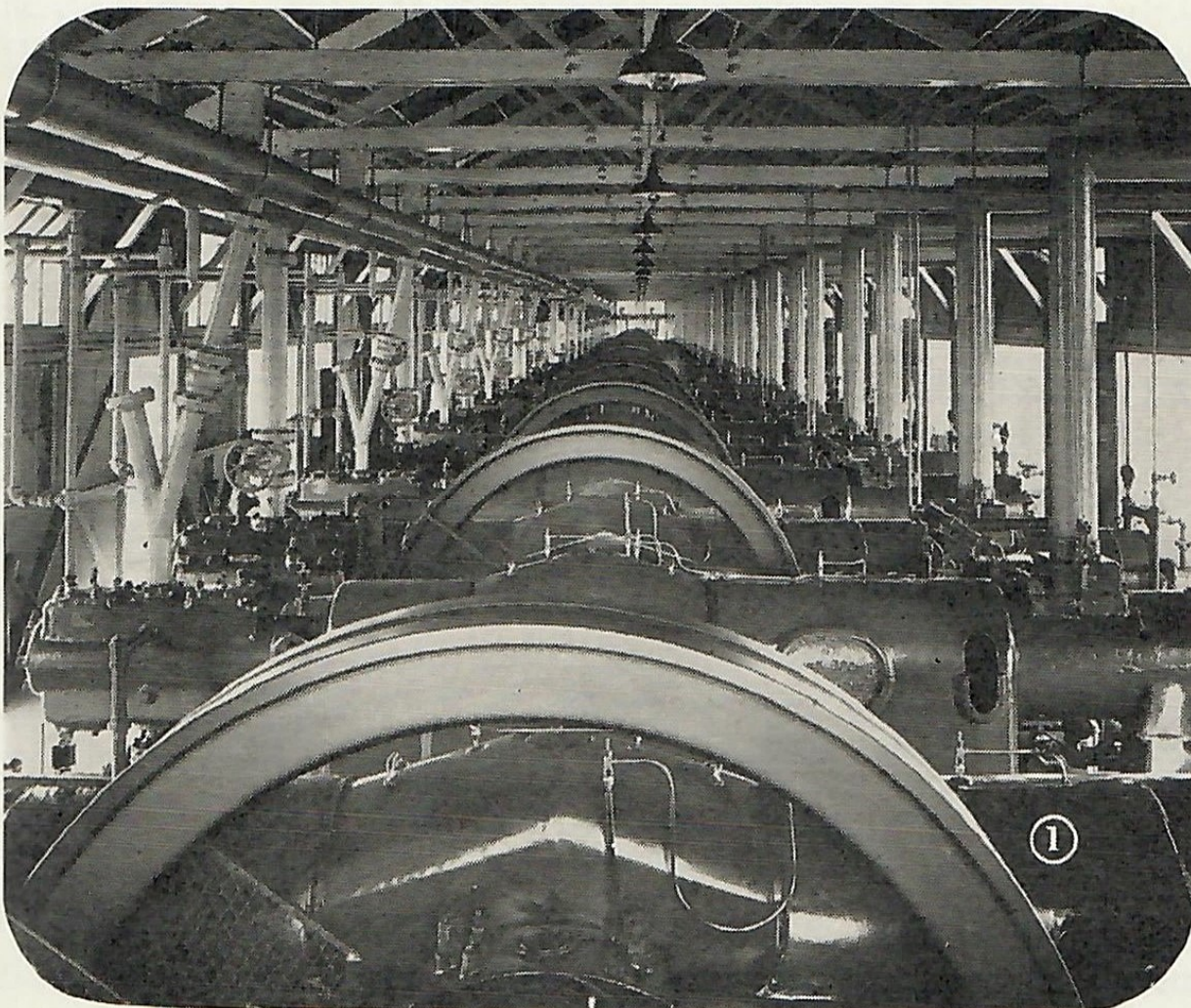
The Long Beach field, a rather prominent topographic high on the Newport-Beverly Hills fault zone, is the dominating factor in the California crude oil production situa-

tion at the present time and this district, sometimes referred to as Signal Hill, will probably continue its domination for several months as there is ample evidence to justify the expectation of its reaching a maximum peak of somewhere between 175,000 and 200,000 barrels daily before the present summer draws to a close. Recent developments tend to indicate the attainment of this goal sometime within the next sixty or ninety days and while it is usually customary for high-pressure fields to show a rapid decline after the period of flush production has ceased, it is not likely that Long Beach will show the abrupt drop which characterized production curves of Santa Fe Springs, as drilling operations in the former field are not all reaching the climax simultaneously but are spread out over a longer period of time. Long Beach is truly the wonder-field of California and although this district has produced in excess of 271,000,000 barrels of crude oil since its discovery back in 1921 it is still one of

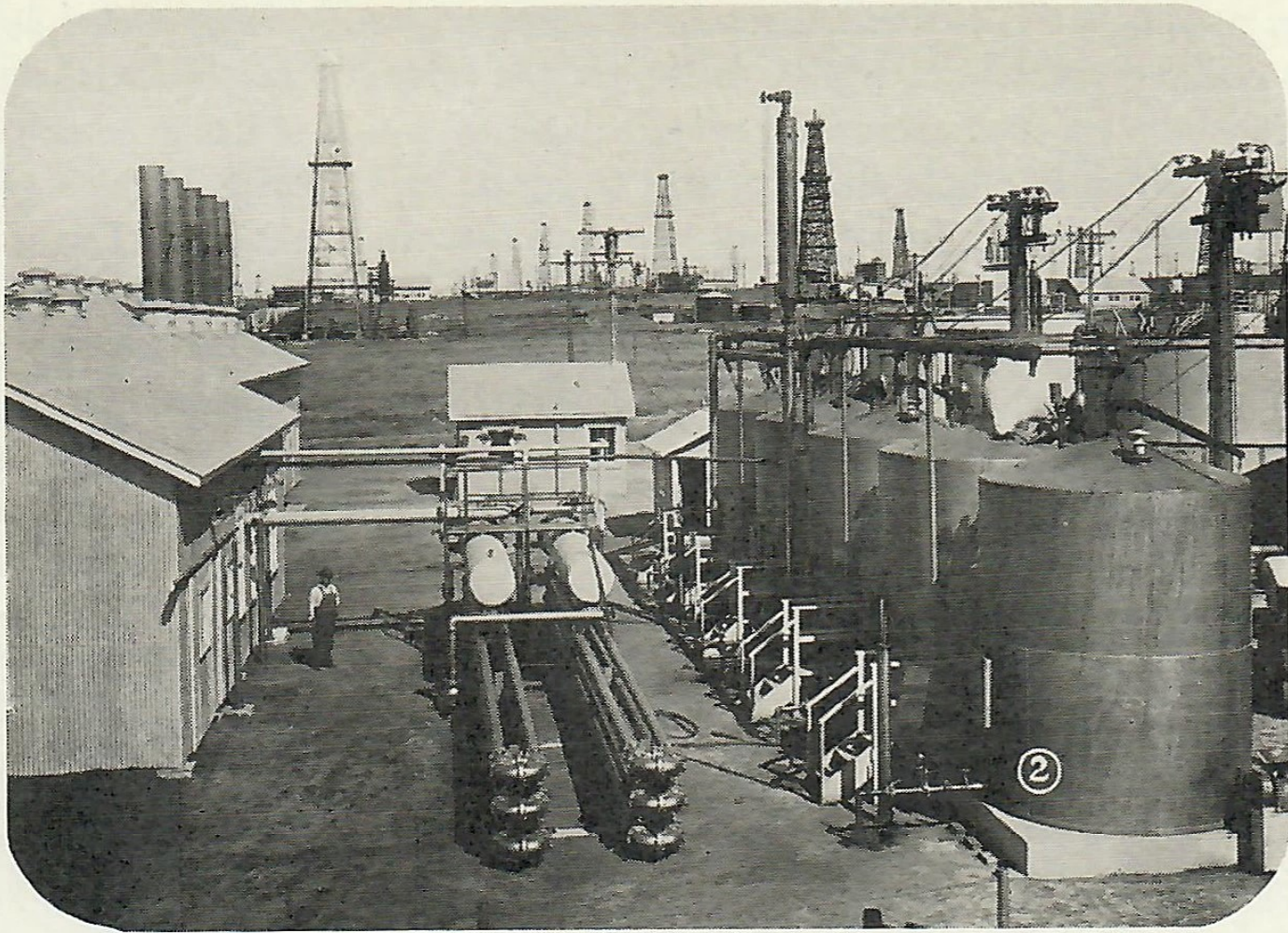
the most prolific fields under development at the present time, notwithstanding the abuse to which it has been subjected over a period of several years as a result of intensive town lot drilling. The prolific tendencies of this field are evidenced in a number of ways and although the proximity of wells permitted drillers to swap yarns from one rig to another, several producers have yielded in excess of two million barrels each while another project is credited with better than three million barrels since completion. The present deep sand exploitation at Long Beach got under way late last year following the cessation of development work in the Alamitos Heights town lot section of the Seal Beach field, but this lower horizon has been productive for a number of years although no one really appreciated the possibilities which it presented until a short time ago. During the early stages of development following the initiation of the present deep drilling campaign late last year, operators established

the six thousand foot level as their objective, but subsequent work indicated the existence of another thousand feet of oil sand and one well was recently brought in under a natural flow from below seven thousand feet with the bit still in the pay when drilling was concluded. Another uncompleted project recently passed the 7,325 foot level and it is the present intention to rotate ahead until a depth of 7,500 feet is attained unless something unforeseen develops.

The Ventura Avenue



Union Oil Company early recognized the benefits to be derived from the use of the gas lift in the Los Angeles Basin. Many new and novel schemes for operating the gas lift were conceived by employees. This picture gives one an idea of the magnitude of compressor plants used in connection with the gas lift and the bringing of gas in from the wells to be run through gasoline extraction plants. This picture was taken at the Gas Division Plant at Dominguez.

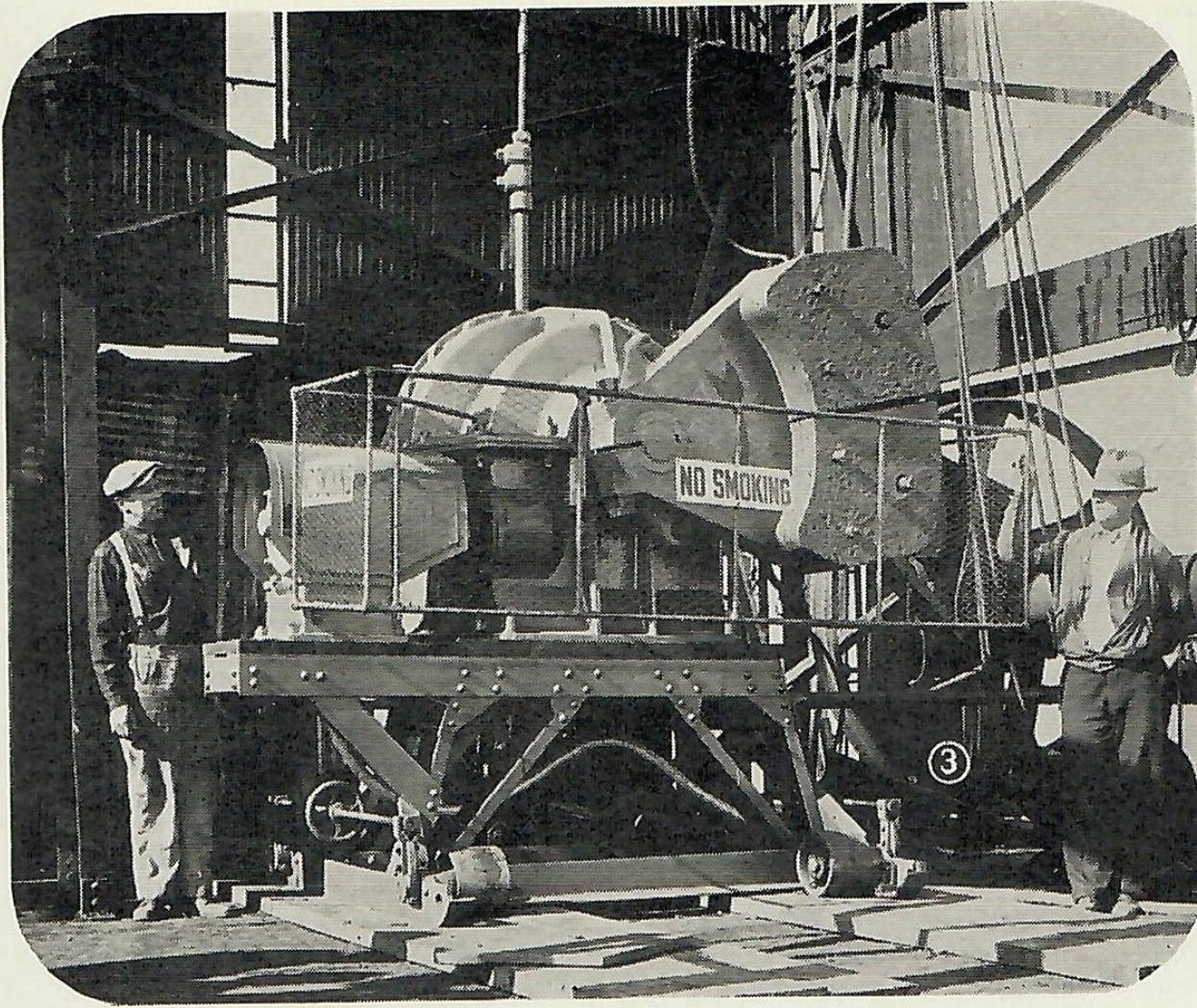


A central dehydrating plant taking care of all oil produced from the company's property in the Dominguez Field. This orderly looking plant is in keeping with the orderly development of the Dominguez Field, which has been made possible by the small number of lessors and operating companies, thereby permitting the uniform spacing of wells where the maximum oil production may be obtained at the minimum cost for development. A number of derricks will be noted in the background showing the layout of well spacing which is considered the nearest to perfection of any field in California.

field, however, has the distinction of yielding the largest deep flowing wells in the State and the total thickness of oil-bearing formation in this district has not yet been definitely determined, notwithstanding the fact that progressive drilling has already carried one deep producer down to 7,200 feet. This is the deepest producer in California at the present time as far as lineal footage is concerned, but subsequent drilling is expected to reveal oil sand down to eight thousand feet or better. This prolific field, a part of the major Ventura Basin, is located a little over two miles north of the city of Ventura, and its enormous drainage area and thickness of oil sands make it the equal of Long Beach, which has already yielded better than 271,000,000 barrels of oil since its discovery and may double this figure before exhaustion. Ventura Avenue could be stepped up to at least 200,000 barrels per day by increasing the scope of development work if necessary, but the recent pinching in of production in order to conserve natural resources indicates that no

such move will be made, as this district is closely controlled and will therefore be drilled according to well-established oil field practice.

Wildcatters in California have opened up five new fields, Rincon, Fruitvale, Potrero, Edison and Round Mountain, since January 1st, 1927, and it is quite probable that one or more may be discovered before the present year draws to a close, as several strategic intervals on well-defined fault zones are under development at the present time. The numerous prolific fields found in the Los Angeles Basin during the first major development cycle, which was recently concluded by the completion of a commercial producer at Potrero, had a tendency to concentrate activities within a relatively limited area and to divert attention away from the northern part of the State, which has possibilities comparable to those enjoyed by Los Angeles Basin previous to 1920. The picture is now reversed, however, and with the second major development cycle well under way, Southern Cali-



An individual pumping jack properly counter-balanced, which permits the use of a small motor for pumping thereby not having any dead load to run up power bills. If this works out successfully in deep well pumping, and a machine can be developed for pulling and bailing deep wells, then the expense per well for providing standard rig ends and pumping machinery will be eliminated. This jack operates at Callender No. 4, Dominguez Field.

fornia will play second fiddle as far as future wildcatting is concerned. Prospecting work during the next several years will center almost entirely in the San Joaquin basin, a vast area which lies north of the Tehachapi Range and attains a maximum width of approximately sixty miles across. The San Joaquin Valley, which is a huge elongated basin several times larger than Los Angeles basin in Southern California, is primarily a great block of the earth's crust which has been tilted westward. This tilting brings up granite on the east but sedimentary rocks appear and increase in thickness until far out in the basin they are thicker than any drill can at present penetrate. This tilting accounts for the prevalence of granitic outcrops east of the Mount Poso and Round Mountain fields in the eastern side of the San Joaquin Basin in Kern County. Both basins have at their centers organic rocks approximating 5,000 feet in thickness that generate oil, above which there are others of an equal thick-

ness which contain soft sands in which the oil collects. The similarity of these two basins indicates the probability of a vast untested reserve in the San Joaquin Valley, and in view of the results obtained to date it is logical to assume that most of the new fields to be discovered in future years will be located in this area.

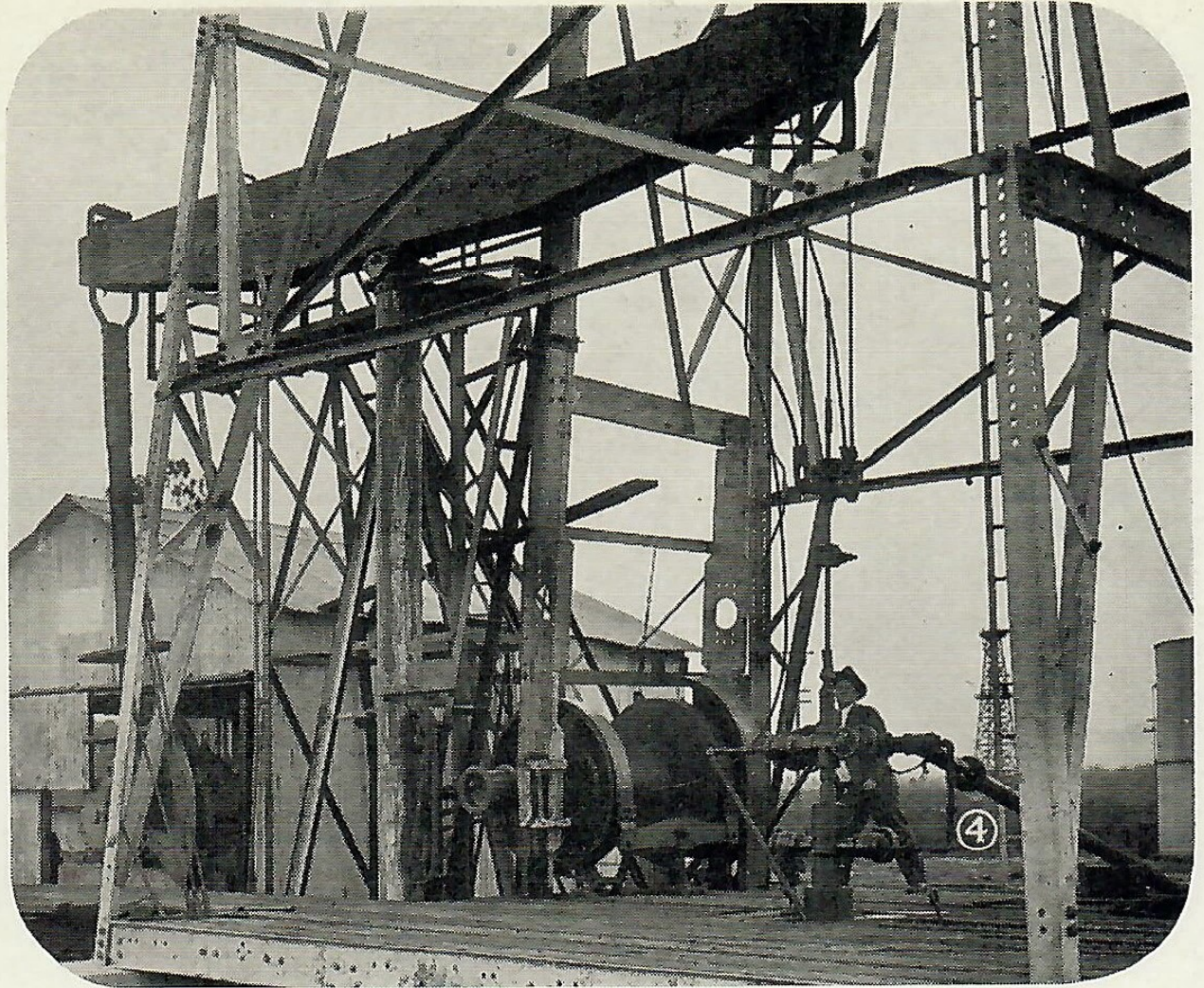
The Rincon field of Ventura County, which is located on the western extremity of the sixteen-mile Ventura Avenue anticline, lies approximately five miles west

of the prolific Ventura Avenue field and seven or eight miles northwest of the city of Ventura. Development work in this field up to the present time has not resulted in the completion of any exceptionally large wells, due to the fact that operators have been drilling ahead cautiously, and while this district will probably not be a second Ventura Avenue there is ample evidence to justify the expectation of developing substantial production at a later date when operators encounter the anticipated lower projected horizons. The acreage in this field is for the greater part held in large blocks and, while this would ordinarily preclude intensive drilling, the irregularity of property lines and other factors have resulted in the concentration of several relatively small leases along the ocean front. A number of wells have been spudded in on these small parcels and while the proximity of these wells does not quite approach intensive town lot drilling the well spacing is rather abnormal in comparison to an

ideal operating status. There were fourteen drilling projects under way in this field during March, and, although Rincon has only produced a total of 63,601 barrels of crude since discovery late last year, this is no criterion of what subsequent development may bring forth.

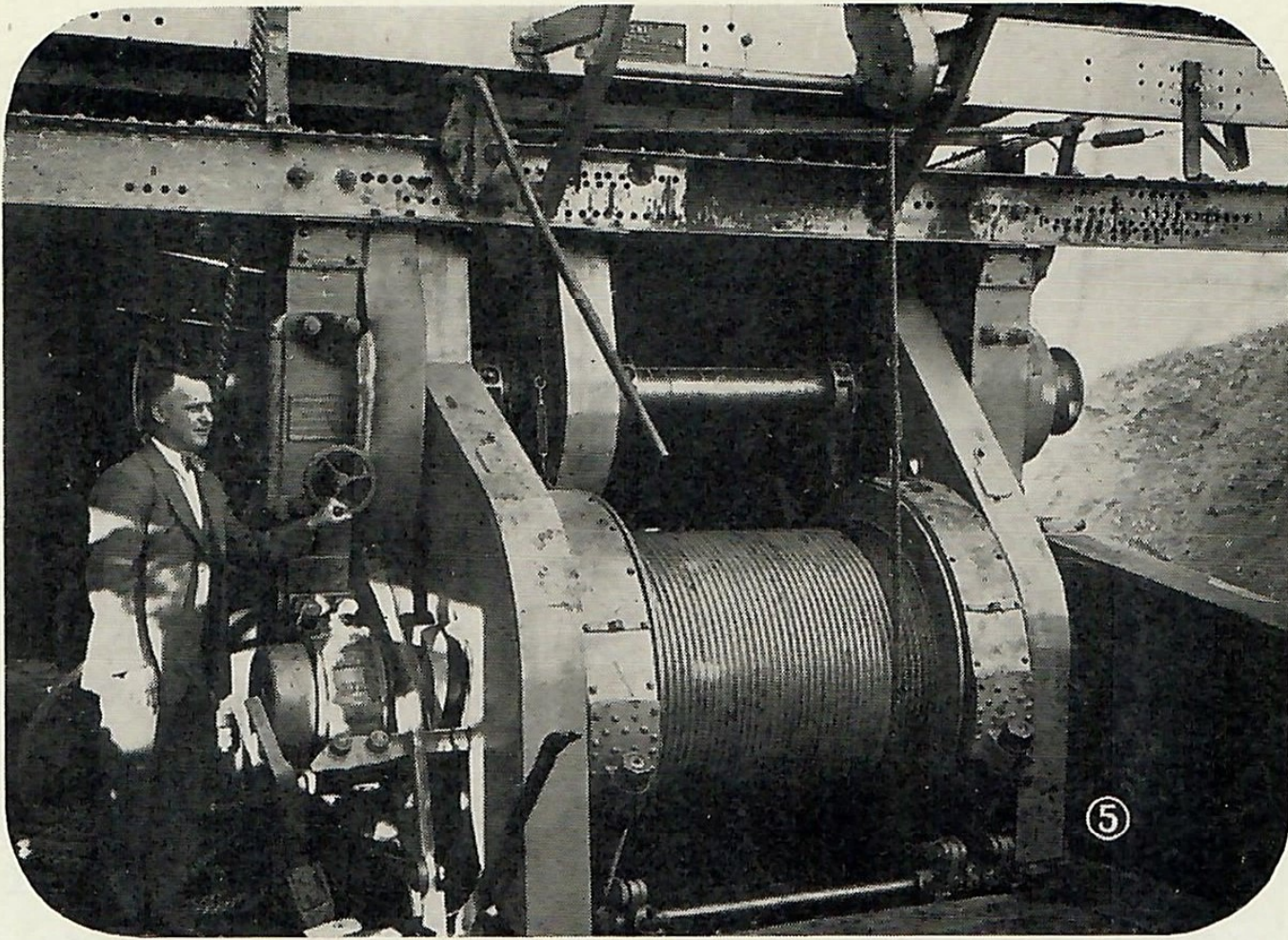
The recent completion of a 1,049 barrel flowing well in the Potrero field of Los Angeles basin has definitely proven up the existence of a new field located approximately midway between the Rosecrans and Inglewood fields, and recent developments indicate the probability of substantial production, although this new area will be conservatively developed due to the apparent absence of any factor which might precipitate intensive drilling. The first commercial producer showed the presence of a high gravity oil approximating 48.5 degrees A.P.I., and a distillation test showed 74.52 per cent, 437 E. P. gasoline. There are nine productive fields located on the Newport-Beverly fault zone, two of which, Dominguez and Rosecrans, were opened up by the Union Oil Company in 1923 and 1924. In the eastern part of the Los Angeles basin, the Union is credited with initial discoveries at Santa Fe Springs and Richfield, both of which have proven highly productive.

The conservation work recently consummated in California as a result of the concerted attempt to eliminate excess production of heavy crude and natural gas is one of the most progressive steps ever under-



A skeleton pumping derrick. This well was drilled with what is known as a bob-tail rig, not having any standard rig end, but drilled entirely with rotary with an extra engine stand-by in the event the rotary engine failed. The well later was equipped with a special pumping unit, through reduction gears using an ordinary gas engine and a derrick hoist for pulling as against the usual standard rig construction. This outfit has been in operation for nine months without any repairs, never having been shut down other than to change the oil in the gear case. This unit is operating at Stern No. 3 at Richfield.

taken and should prove mutually profitable to both producer and consumer. The successful conclusion of this movement has entirely eliminated the waste of natural gas and reduced uneconomic production of heavy crude to a minimum. A curtailment of approximately sixty-five million cubic feet per day has been effected in the production of natural gas at Ventura Avenue, and with the daily output arbitrarily limited to pipe line capacity, producers are no longer forced to blow this excess energy off into the air. Ventura Avenue is an exceedingly high pressure field and the excessive gas-oil ratio necessitated considerable study due to the number of complicated factors involved, but this was finally worked out however and the production of natural gas was arbitrarily reduced approximately sixty-five million cubic feet per day. This was accomplished by pinching in a number of flowing wells and although crude oil production was simultaneously reduced



Shows 36-inch rotary drum being developed by the company with a view to eliminating much of the damage to wire rope in rotary drilling due to over-winding on drums where the strands of wire drop in between two other strands. This is especially destructive to wire rope where the line is spooled up loosely without any load while drill pipe is being run into the well. The elevator goes up empty then suddenly takes the full load of drill pipe sometimes weighing fifty or one-hundred tons, causing the pulling line to cut through the loosely wound coils on the drum. It will be noted that the first layer of wire lies in corrugations thereby making it impossible for poor spooling. The second coil will spool smoothly as it has the grooves between the coils of rope to follow. The two coils on the drum will take the whole amount of line to be spooled each time a stand of drill pipe is raised, so the destruction caused by over-winding should be practically eliminated.

eleven thousand barrels per day, producers willingly accepted this diminution of light oil production in the interests of conservation. This curtailment indicates the high gas-oil ratio incident to the development of the prolific Ventura Avenue field, as it will be noted that over six thousand cubic feet of natural gas was conserved for every barrel of crude oil shut in. Under ordinary conditions one might anticipate an exceptionally large wastage of natural gas at Long Beach during the coming summer as a result of greatly increased production and a smaller demand due to the normal seasonal decline in consumption, but excess gas production will be used for repressuring work, and stored in other fields until needed. In addition to the gas conservation work undertaken in California during the past several months producers have arbitrarily shut in approximately fifty thousand barrels per day of heavy crude because of

greatly diminished tanker shipments of heavy crude and refinery residuum from California, due to increased importations from Venezuela. It is impossible for California producers to economically compete with heavy oil from either the latter area or West Texas, as this oil can be laid down on the Atlantic seaboard at considerably less than one dollar per barrel. It is interesting to note in this connection that not a single barrel of commercial fuel oil, either heavy crude or refinery residuum, has left California for the East Coast since last late year and no immediate improvement is yet in sight, although conditions sometimes change almost over night. The diminution of these tanker shipments of heavy crude and fuel oil to Atlantic and Gulf Coast ports has had the effect of reducing the consumption of California oil approximately 7,010,531 barrels, this representing the amount which was lifted during 1927.

(Continued on page 20)

To the Members of the Provident Fund

THERE IS HEREWITH SUBMITTED a report showing the financial affairs of the Provident Fund for the year ended December 31, 1927, together with duly certified Balance Sheet, Income and Reserve Accounts.

The Provident Fund was inaugurated July 1, 1923, and on December 31, 1927, the total resources of the Fund amounted to \$4,336,263.76, as compared with \$3,257,002.07 at the close of the year 1926.

Investments made in stocks, bonds, and mortgages during the year 1927 amounted to \$998,816.95, making a total of \$3,778,334.17 for securities owned by the Fund. The market value of these securities at the end of the year was in excess of the value shown on the Balance Sheet.

The Income Earned during the year was \$205,413.14, an increase of \$65,562.25 over the previous year. The Net Income for the year 1927 carried to Reserve was \$69,232.18, after deducting 5% interest credited to Members' Accounts amounting to \$136,180.96.

The Reserve Account as of December 31, 1927, amounted to \$809,480.38, an increase over December 31, 1926, of \$201,211.80. Of this amount \$131,979.62 represents credits from members' withdrawals and the balance of \$69,232.18 Net Income for the year.

Since the inception of the Fund, the members have contributed \$1,963,358.26 and the Company a like amount. Interest at 5%, compounded semi-annually on the combined contributions, amounting to \$303,130.00 has been credited to Members' Accounts, making a total of \$4,229,846.52 for the four-and-one-half-year period.

There has been a steady increase in membership in the Fund, and there are now 4,700 members representing 78% of those eligible, as compared with 4,256, or 73%, on December 31, 1926.

By order of the Board of Administrators.

GERALD G. BLUE,
Secretary

UNION OIL COMPANY OF CALIFORNIA
PROVIDENT FUND

BALANCE SHEET—DECEMBER 31, 1927

ASSETS

Cash with Union Oil Company of California at 5% and in Bank	\$	486,538.35
Securities Owned:		
Union Oil Company of California Capital Stock 13,948 Shares at \$45.00	\$	627,660.00
Union Oil Associates Capital Stock 19,016 Shares at \$43.12		819,882.49
		\$1,447,542.49
Common Stocks of Railroads, Telephone Cos., etc.		660,952.50
Preferred Stocks		547,540.35
Bonds		915,546.22
Mortgages		206,752.61
		3,778,334.17
Loans to Members		45,027.00
Income Accrued		26,364.24
		\$4,336,263.76

LIABILITIES

Members' Credits:		
Members' Contributions:		
Less Withdrawals and Death Benefits	\$354,905.06	\$1,759,994.01
Company Contributions:		
Less Death Benefits and Transfers to Reserve	\$348,109.70	\$1,766,789.37
Reserve		\$3,526,783.38
		809,480.38
		\$4,336,263.76

INCOME ACCOUNT FOR THE YEAR ENDED DECEMBER 31, 1927

Income from Interest, Dividends and Profit on Securities Sold		\$218,988.29
Deduct:		
Expense of Administering Fund	\$ 13,575.15	
Interest at 5% Credited to Members' Accounts	136,180.96	149,756.11
Income for the year carried to Reserve		\$69,232.18

RESERVE ACCOUNT

Credits to Reserve on Members' Withdrawals		\$326,059.98
Difference between Cost and Stated Value of Securities . .		343,419.42
Income Account:		
Balance December 31, 1926	\$ 70,768.80	
Add Net Income for year as shown above	69,232.18	*140,000.98
Balance carried to Balance Sheet		\$809,480.38

*NOTE:

Net Income from July 1, 1923 (date of Commencement of Fund) to December 31, 1927		\$443,130.98
Less Interest at 5% credited to Members' Accounts . . .		303,130.00
Total Net Income to December 31, 1927		\$140,000.98

AUDITORS' CERTIFICATE

Los Angeles, California, March 29, 1928.

We have examined the books and accounts of the Union Oil Company of California Provident Fund for the year ended December 31, 1927, and certify that the above balance sheet, reserve and income accounts in our opinion fairly set forth the financial position as of December 31, 1927, and the administration of the Fund to that date.

PRICE, WATERHOUSE & CO.

The Geologist Turns Skyward

By E. B. NOBLE

Geological Department

THE great strides made in the field of aviation in the last few years have made the airplane useful in many branches of the oil industry. It plays a conspicuous part in the present-day development work,



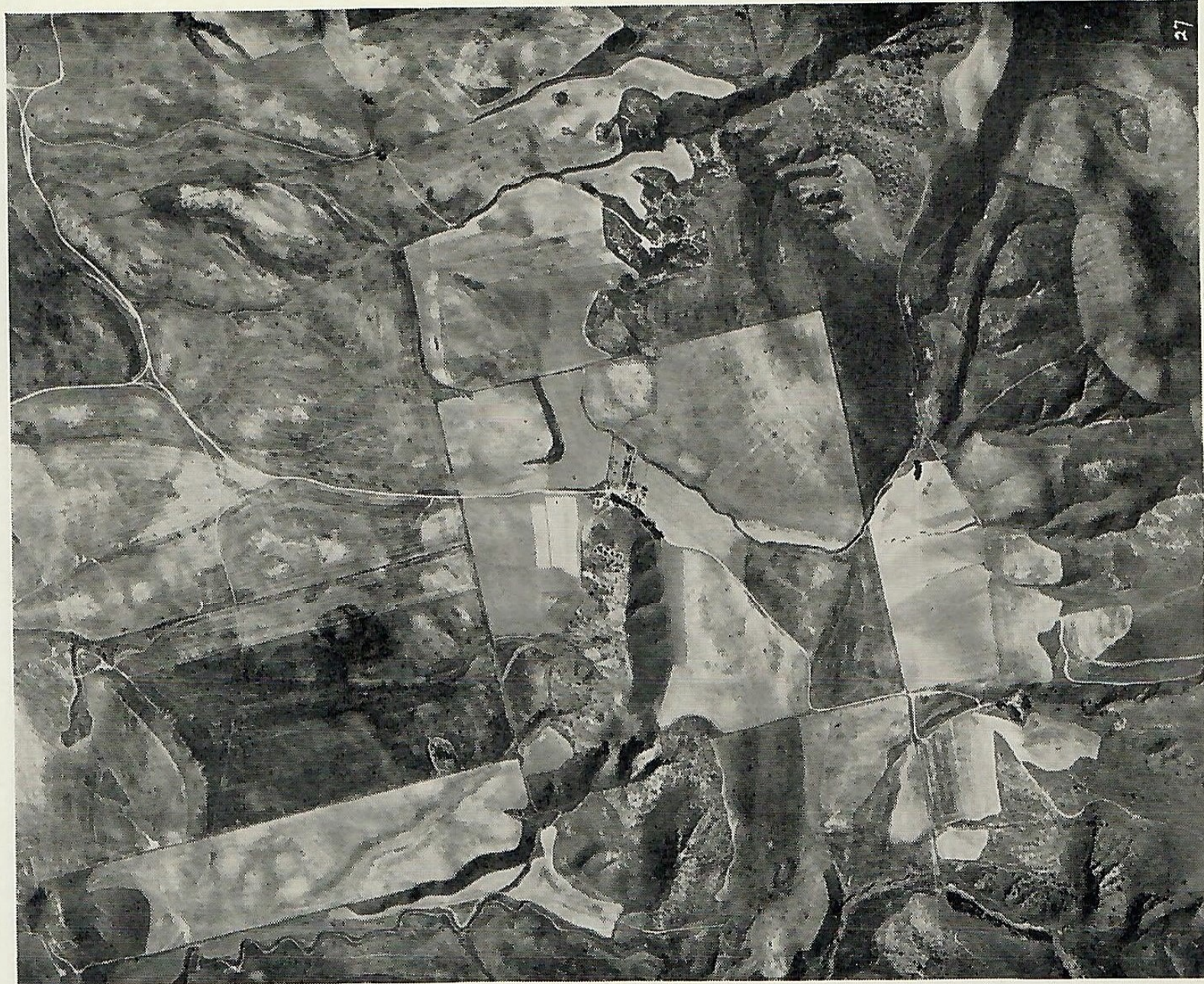
E. B. NOBLE

especially in the geological and land departments of the larger oil companies. The airplane is a great time-saver in preliminary work of a reconnaissance nature. In unexplored areas it is possible by this means to eliminate certain portions as unfavorable and to plan the work so that the time will be spent in the part most likely to bring definite results. It also aids in determining the best means of approach, and one can start out with a good idea of the obstacles to be met with enroute. As an illustration of the time saved by this method, the trip made by Rod Burnham, Manager of Lands, and the writer, over the Northern fields of Mexico, is of interest. This trip was made in an old "Jenny" plane during the rainy season when most of the area was flooded and it was almost impossible to travel by train, automobile, or in many cases even by mule. To cover this area would have taken at least a month of extremely difficult traveling on jungle trails, from which only the meagerest idea of the country could have been obtained. The actual trip, however, was made in $3 \frac{1}{4}$ flying hours and enabled them to obtain a comprehensive idea of the entire area.

In map making the airplane is also a time-saver, since it gives a fairly accurate working map in a fraction of the time necessary to prepare a map of the same accuracy by the ordinary methods of surveying. It is, however, necessary to do a certain amount of surveying, as a ground control must be established in order that the various parts of the map may be brought to the correct scale. It is usual practice to finish the map for ordinary geological field work to a scale of 1000 feet to 1500 feet to the inch. Working with the ordinary contour map, it is sometimes difficult to accurately locate one's self in the field, but with an airplane map this task is relatively easy. This of course is due to the fact that much more detail is included in the aerial map, and often a clump of bushes, a peculiarly shaped rock, or even a bend in some old trail that might not have been considered worthy of note by the topographer, will serve to locate one accurately and quickly.

When portions of various pictures are cut out and joined, a mosaic of considerable accuracy can be made, providing that sufficient care is taken to bring the various portions of the pictures to a uniform scale and to match them so that they assume the correct relative position. In working in the field the geologist uses only the individual contact prints, but this data may be transferred to the large map and eventually a complete map will be built up giving the whole geologic story.

Individual contact prints on dull paper are convenient to work with in the field, since the data can be put directly on these maps with pencil, whereas on a glossy finish it would be difficult to do this. The



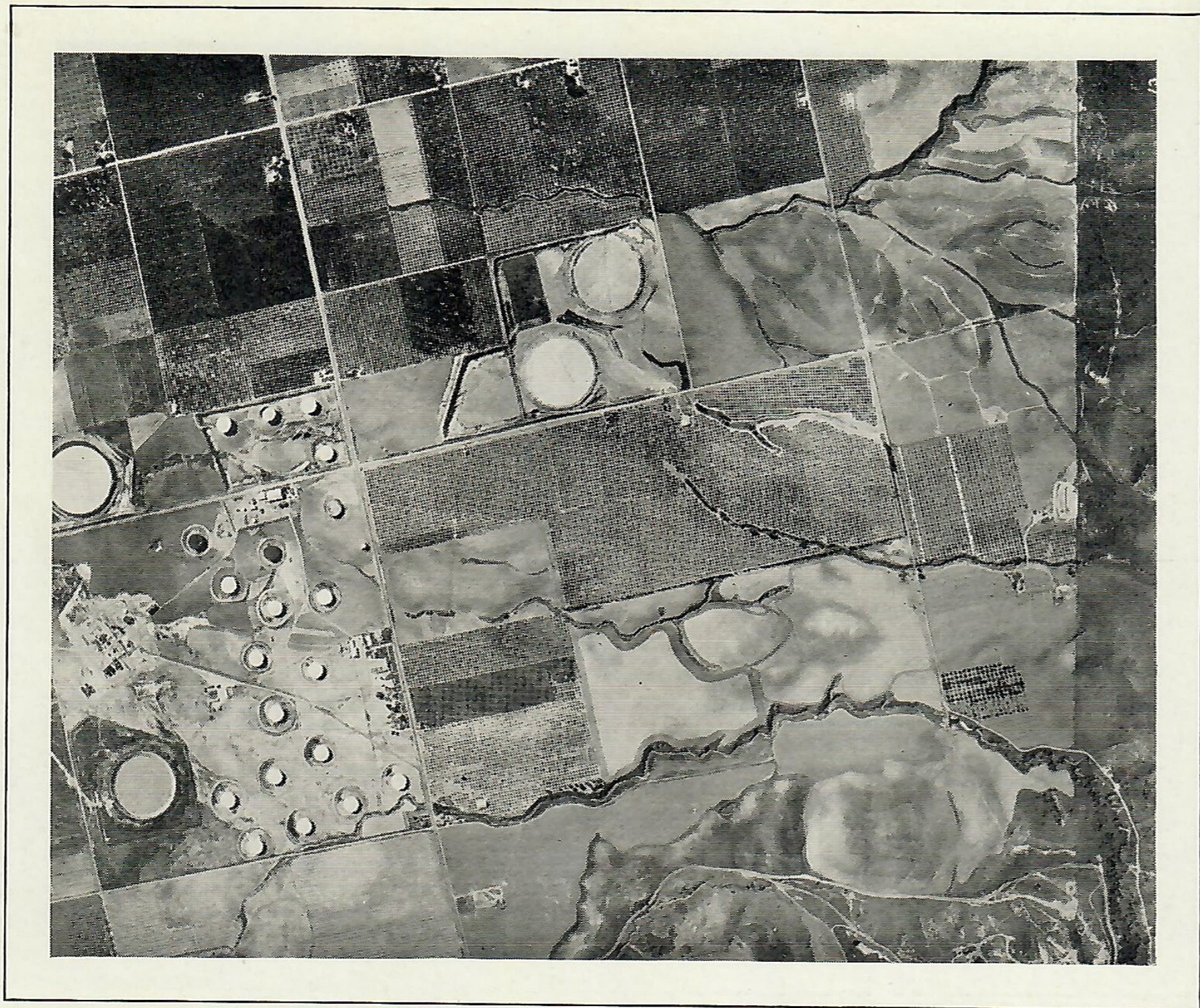
An example of fault-line topography. The scarp of the Puente Fault can be seen in the right half of the picture.

geologist may carry a small stereoscope and by arranging his prints so as to get the stereoscopic effect, he may see the various hills, valleys, trees, houses, etc., as clearly as if he were looking at a tiny model of the same area.

Although the airplane cuts down the time necessary to make working maps, and quickly eliminates certain unfavorable areas, it does not necessarily reduce the work of the geologist in the field. In fact it is quite likely to increase it, for practically everything of geological interest that is seen in the map must be visited and examined in detail. A study of the stream pattern and of the topography may give very valuable indications of structure, but in most cases a reliable check in the field is necessary. It is often possible to recog-

nize certain features in these pictures which might go unnoticed by the ordinary field methods. This is well illustrated by the discovery of several faults on the East side of the San Joaquin Valley in areas which had previously been covered by geological parties. Until the aerial photographs were studied many of these faults passed unnoticed, but their presence has since been definitely proven, either by detailed geological work or by drilling.

Under the jurisdiction of our Geological Department an interesting airplane map is now being prepared which will cover a number of Union Oil Company properties in Orange County. This picture will include a strip approximately two miles wide along the Puente fault, extending from Union Oil Company's Olinda property on the east to



Part of our Stewart tank farm. Notice how clearly the natural drainage system shows up.

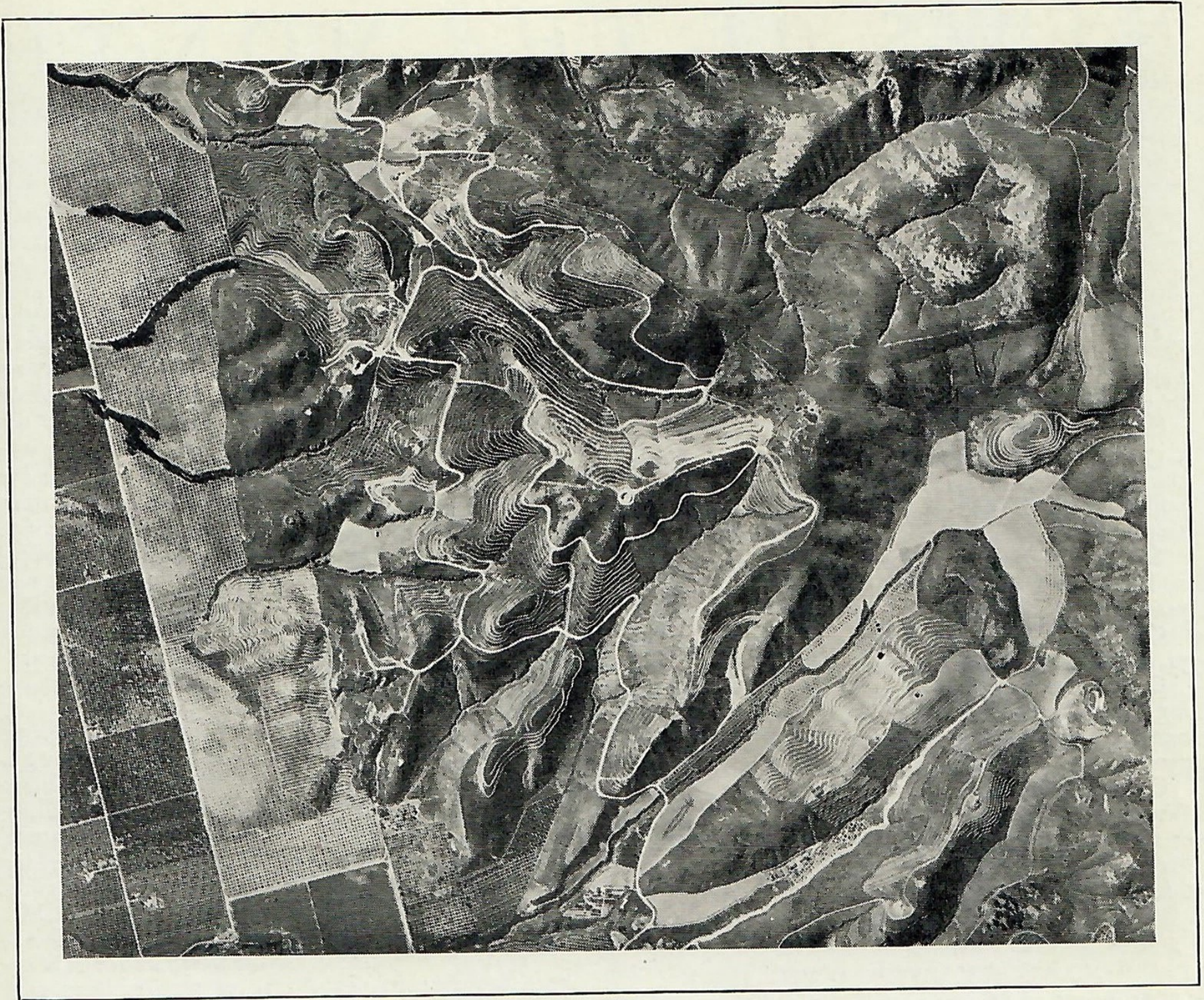
the Whittier field on the northwest. We hope that a study of this composite picture will give us a better understanding of the part the Puente fault has played in the geologic history of the Los Angeles basin and of its relationship to the present producing fields.

It is also probable that the company will utilize the airplane in preparing a map of our Miahupam concession in the State of Vera Cruz, Mexico. This property is located in a region heavily covered with forest and jungle growth, making it a difficult task to obtain a map by the ordinary surveying methods. To prepare a map by the old methods would require months of hard work in a tropical country, necessitating brushing out a dense jungle growth in order to prepare the net-work of triangulation points necessary to survey many

miles of property lines, and would require a force of fifty or more brush cutters. This entire area can be flown in a few hours and a finished map turned out in about two weeks time.

At the present time we know of no use being made of the airplane for geological mapping in Venezuela. This condition is not due to any impracticability in the use of the planes, but to governmental objection to private individuals or corporations operating them. Possibly this objection is based on the fact that planes falling into the hands of certain individuals might be used to further their political ends.

If a time comes when the government of Venezuela sees fit to permit planes being operated, their use as an aid to geological work should be of major importance. Only meager and inaccurate surveys have been



A portion of our Sansinena property. The hillsides have been terraced to plant avocados.

made of this relatively unexplored country and a large amount of the geologist's time is now taken up in trying to locate himself with respect to concession boundaries. The airplane map would be of great value in this work alone.

Contrary to the general belief, a large part of Venezuela is adapted to flying. Over

the desert areas no difficulty would be experienced in landing, while the Caribbean Ocean, Lake Maracaibo, and many of the larger jungle streams as the Orinoco, Apure, Meta, or Cura are accessible to the hydroplane. The proximity of the present producing areas to Lake Maracaibo makes the use of the hydroplane attractive.



NEWS OF THE MONTH



OPERATIONS FOR FIRST QUARTER

First quarter operations of the company for 1928 show a net profit of \$2,500,000 as compared with \$2,600,000 for the same period of last year and \$1,548,000 for the final quarter of last year.

Production for the three months approximates 3,350,000 barrels, a decrease of 910,000 barrels from the same period of 1927. This was occasioned by the policy of curtailing new drilling operations and shutting in about 18,000 barrels of crude oil per day.

Sales for the three months approximate \$19,370,000, an increase of \$1,300,000 over the same period of last year.

Crude oil and petroleum products in storage March 31, 1928, approximated 23,500,000 barrels.

Capital outlay approximated \$3,000,000, representing expenditures for the acquisition of additional territory, field development and additions and improvements to refining and marketing facilities.

Current assets, consisting of cash, United States Government and other bonds, accounts and bills receivable, oil inventories and materials and supplies on March 31, 1928, amounted to \$57,000,000, or about 6 to 1 of current liabilities.

QUARTERLY DIVIDEND DECLARED

The Board of Directors of Union Oil Company of California, at a meeting held in Los Angeles April 6th, declared the regular quarterly dividend of 50 cents per share, payable on May 10th to stockholders of record at the close of business April 18th, 1928.

COMPANY TO DRILL IN MEXICO

Development work is about to be started on the company's Hacienda Maihuapam lease in Mexico. The lease consists of approximately 26,300 acres south of the Tuxpan River, about 100 miles from Tampico.

The company is now surveying and building roads, and equipment is being assembled at Tuxpan River for shipment. Everything is expected to be on the ground within ninety days, and drilling will be started shortly thereafter.

Lease of the Hacienda Miahupam was made about a year ago, the company recently receiving concession from the Mexican government confirming the titles.

It is planned to pipe the oil from the field to the Tuxpan River, about twenty-eight miles, where it will be loaded on tankers.

WM. GROUNDWATER RECEIVES APPOINTMENT

Wm. Groundwater, Manager of Transportation, has been appointed to serve on the American Committee of Classifications, Lloyd's Register of Shipping. All problems involving the classification of American vessels are disposed of by this committee, the members of which are marine operators having active direction of large tonnage.

OUR NEW CREDIT MANAGER

C. W. Reeder, formerly Assistant General Credit Manager, was appointed General Credit Manager February 14th, this year, succeeding the late W. C. Trew.

Mr. Reeder became associated with the company in 1915, and has been in its continuous employ for more



C. W. REEDER

than twelve years. Prior to this he had been for five years in the New York City offices of the Pennsylvania Coal & Coke Corporation, employed in their joint Treasury-Credit Department, in charge of collections.

In 1921, after having acquired a thorough knowledge of the policies and methods of handling our company credit matters while carrying out various assignments in connection with sub-station sales, Mr. Reeder was appointed Assistant District Credit Manager, Los Angeles, in charge of metropolitan area credits. Four years later, February 1, 1925, he succeeded to the position of Los Angeles District Credit Manager. His capabilities were further rewarded January 1, 1927, when he was selected to become a member of Mr. Trew's staff in Head Office in the capacity of Assistant General Credit Manager.

PUMPING SPEED AT PANAMA

Word has been received from R. C. Worsley, District Sales Manager at Balboa, Canal Zone, that a new record has been established for the oil handling plants at the Canal. On the night of March 30th-31st Union Oil Company bunkered four vessels simultaneously and without delay to any ship.

As the Canal's pumping plant has only three pumps, this record was made possible by using the company's pumping station, pumping direct to the fourth vessel. It is unusual that one company will have four vessels to bunker at one time, and the fact that the four vessels were handled simultaneously demonstrates the efficiency of the bunkering facilities at the Balboa Terminal of the Panama Canal.

Following is a record of the deliveries made:

VESSEL	STARTED	FINISHED	BBLs. DELV'D
Orbita	7:15 P.M.	3:40 A.M.	20,353.44
King Edgar	10:00 P.M.	1:40 A.M.	4,124.00
City of Carlisle	9:25 P.M.	1:40 A.M.	2,140.15
West Honaker	5:00 P.M.	11:50 P.M.	9,820.41

LA BREA LEAVES FOR AUSTRALIA

The S. S. La Brea sailed April 5th for Australia and New Zealand with 74,000 barrels of refined oil for the Atlantic Union Oil Company, Ltd. A second cargo will be dispatched early this month, with a gradual quickening of sailings as the new enterprise gets under way.

The Atlantic Union Oil Company, Ltd., was formed last fall by Union Oil Company of California and the Atlantic Refining Company especially to develop the Antipodean trade. Since its formation the new company has constructed large bulk terminals at Sidney and Melbourne, Australia, and Wellington and Auckland, New Zealand. Facilities are also being developed for a wider distribution among the smaller cities.

FEMININE CAGERS ORGANIZE

On April 17th a meeting was held by the Los Angeles City Playground Department, at which girl representatives from most of the large corporations of the city attended, Miss Helen Curran of the Insurance and Personnel Department representing Union Oil Company.

Arrangements were made to start a series of basketball games between the girls of the different firms, and Union Oil Company entered two teams, one from the Geological, Land and Field Departments, and the other from the Insurance & Personnel and Comptrollers Departments.

Great enthusiasm is being shown and should result in some very exciting games. Dates and schedule of contests will be announced later.

MARCH CRUDE PRODUCTION

The total production of crude oil in California for March amounted to 19,118,324 barrels, an average of 616,720 barrels per day. This is a decrease of 5,296 barrels per day under February production.

Total stocks of crude and all products in Pacific Coast territory decreased during the month 417,489 barrels. The total stocks at the end of the month were 140,798,874 barrels. The total stock increase for 1928, up to March 31st, was 1,458,524 barrels.

Fifty-five wells were completed during the month with an initial daily production of 35,353 barrels, compared with 70 wells completed during February in an initial production of 40,333 barrels.

Complete details of production and development by fields for March will be found on page 23.

THIS OCCURRED YEARS AGO, HOWEVER

Walter P. Farrell, title examiner for the Franchise and Rights of Way Department, made an interesting discovery while searching the records of the title company recently.

In Book A, page 413 of Deeds, appears the record of a deed dated February 5, 1847, between one Ramon Valdez, as grantor, and Ygnacio Machada, as grantee. By the deed, Valdez conveys as follows: "Land containing 600 vines, and a few fruit trees, and a house containing three rooms, two doors, two windows with an iron railing and two porches, for the sum of 46 barrels of grape brandy to contain 150 quarts each and of 25 degrees and good quality, payable in seven years."

Although this deed held brandy in the old days, our legal department would probably advise us that it wouldn't even hold water today.

VENEZUELA TEST WELL

The initial test well to be drilled on the company's holdings in Venezuela was spudded in April 15th, provided nothing conflicted with the prearranged schedule. The well is located about two and a half miles from the Caribbean Petroleum's producing well, and about four miles south of the old Mene Grande field, one of the best known fields in Venezuela. It has been located structurally on what is hoped to prove an extension of the Mene Grande field.

Holdings of the company in Venezuela are approximately 880,000 acres in blocks scattered over both the eastern and western areas of the country. In nearly every instance these blocks adjoin properties held and being developed by other major oil companies.

MARINE NOTES

The following vessels went in for annual dry-docking, boiler cleaning and Government inspection during April:

S. S. Cathwood	S. S. Montebello
S. S. La Placentia	S. S. Utacarbon

The S. S. Santa Maria is proceeding from Cristobal to Port Limon, Costa Rica, to make a 60,000-barrel delivery of fuel oil into the United Fruit Company's (Great White Fleet) storage at that point.

Port Limon is one of the greatest banana loading ports in the world, exporting millions of bunches of the tropical fruit annually.

THIS MONTH'S COVER

The cover this month is by A. A. Hills of Laguna Beach. As a painter of skies this artist gets the quality of softness and movement which is the gift of few painters. The locale of this picture is probably familiar to many older residents of Pasadena. It shows a stretch of tawny mesa on the edge of the city as it looked several years ago after an "unusual" June shower. The old ranch house and the vineyard surrounding it have now disappeared, having given way to the rapidly growing city.

MUNICIPAL PARADE AT FALLBROOK

A celebration was held recently at Fallbrook, honoring the opening of the paved highway and installation of ornamental lights in Fallbrook. The celebration



consisted of a parade of decorated floats through the town, street dances and other entertaining events usually attendant wherever the carnival spirit prevails. Our agent, F. A. Kirkpatrick, arranged to have an automobile decorated, advertising Union Ethyl Gasoline, and featured in the parade. The float is shown in the accompanying photograph.



MODERN

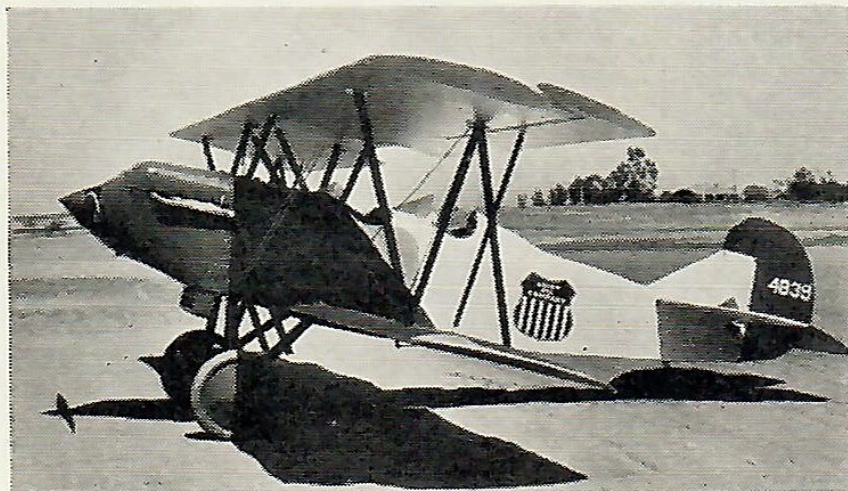
This is the new Beverly & La Brea station, Los Angeles, completed last month. Many new ideas in its construction were suggested by the prize-winning designs in the recent architectural competition.

MOONLIGHT AND PICKLES A LA BREWSTER

Shortly after dusk on the evening of April 5th, between sixty and seventy employees of the Phoenix sales district gathered at the foot of Camelback Mountain where they enjoyed another of their famous moonlight picnics on the desert.

TED TAKES THE AIR

T. S. Lundgren, our Aviation Representative, has been furnished with a 100-hp. Travelair Airplane in which to make the rounds of airports in Union Oil territory. It will also be used by C. F. Lienesch. The plane can carry three persons, go 100 miles an



hour, and has a cruising radius of about 700 miles. The wings are painted silver, the fuselage blue and white, with the usual Union Oil shield on each side of the fuselage and under the right wing.

OAKLAND GIVES FAREWELL PARTY

One hundred members of the Aristo Club of Oakland gathered together at a dinner dance on the evening of March 29th to bid adieu to several fellow workers who have recently been promoted to other districts.

H. E. Golding, District Accountant, was transferred to San Diego. F. E. Lee, District Credit Manager was transferred to head office, and Walter Davis, Lubricating Sales Engineer, left to assume his new duties as Railroad Lubricating Engineer.

J. H. Dasteel, District Sales Manager, acted as master of ceremonies, and his well-chosen remarks to his fellow workers on behalf of the Aristo Club and the Oakland District employees were enjoyed by all.

ORANGE DISTRICT MINSTRELS

The minstrel show which was given by the Orange District Social Club at the Graham & Loftus recreation hall on evening of March 22nd turned out to be such a "wow" that the management was forced to repeat the performance before a capacity crowd of 500 employees, families and friends on April 12th.

The show was directed by W. D. Kuhns and the players were composed of employees in the Orange District. The committee in charge of arrangements and to whom credit is due for the success of the entertainment was composed of W. D. Kuhns, Chairman, R. W. Landreth, L. L. Lemon and Hubert Leeson.

Following the entertainment, refreshments were served and music for dancing was furnished by Hubert Leeson's dance orchestra.



LOS ANGELES TO SAN FRANCISCO IN THREE HOURS

Three airplanes, each with a cruising speed of 120 miles an hour and a full speed of better than 150 miles every sixty minutes are now being operated by the Western Air Express, Inc., in the maintaining of a regular aerial passenger service between Los Angeles and San Francisco.

The trip between the two California cities is made in three hours, leaving one city at 10:30 A. M. and

arriving in the other at 1:30 P. M. The fastest railroad trains take approximately fourteen hours to make the same trip.

The airplanes, which were designed by Antony Fokker, offer every comfort of the modern parlor Pullman car. Each plane is operated by three motors developing 1275 horsepower. Any one of the three motors will sustain flight for 100 miles.

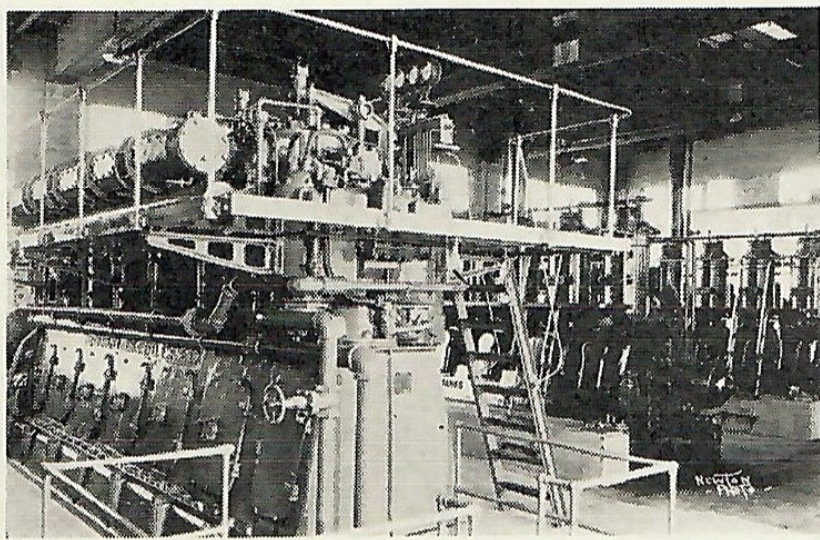
EMERGENCY HOSPITAL AT BREA

The company has about completed construction of an emergency hospital at Brea, California. The work has been under the direction of the Engineering Department, with Malcolm Bacon superintendent in charge. Dr. Glen Curtiss, company physician, will operate the establishment.

The building is of Spanish architecture with Mission tile roof and parapet walls, also tile covered. It comprises a large reception room, three treatment rooms, doctor's private office, laboratory, X-Ray room, surgical room and patients' ward. Only the most modern surgical appliances will be installed.

AMONG OUR SATISFIED CUSTOMERS

The accompanying photograph shows the interior of the municipal diesel electric plant which is being very successfully operated by the City of McMinnville, Oregon. It consists of two 300-brake horsepower



Type Y, two-stroke-cycle Fairbanks-Morse Engines, directly connected to 250 K.B.A. Fairbanks-Morse Generator and one 600-brake horsepower Type B-100 four-cycle Busch-Sulzer Engine directly connected to a 512 K.B.A. General Electric Generator.

This plant is lubricated throughout with Union Diesel Engine Heavy and Aristo Special Heavy. "The excellent lubricating qualities of Union products," writes Mr. Snyder, Chief Engineer, "have been a very

decided contributing factor toward the successful operation of this plant."

PINBUSTERS JUSTIFY THEIR NAME

The East Coyote Field Department team known as the Pinbusters, finished first place in the Orange District bowling league. The personnel of the winning team is as follows: Milton Varner, Captain, Ray Hatfield, Earl Fields, H. O. Van Duesen, Harry Alger, David Hearn, and Henry Dwyer.

On Wednesday evening, March 28th, 1928, the ten men having the highest average bowled for a cup donated by the Brunswick Balke Callander Company.

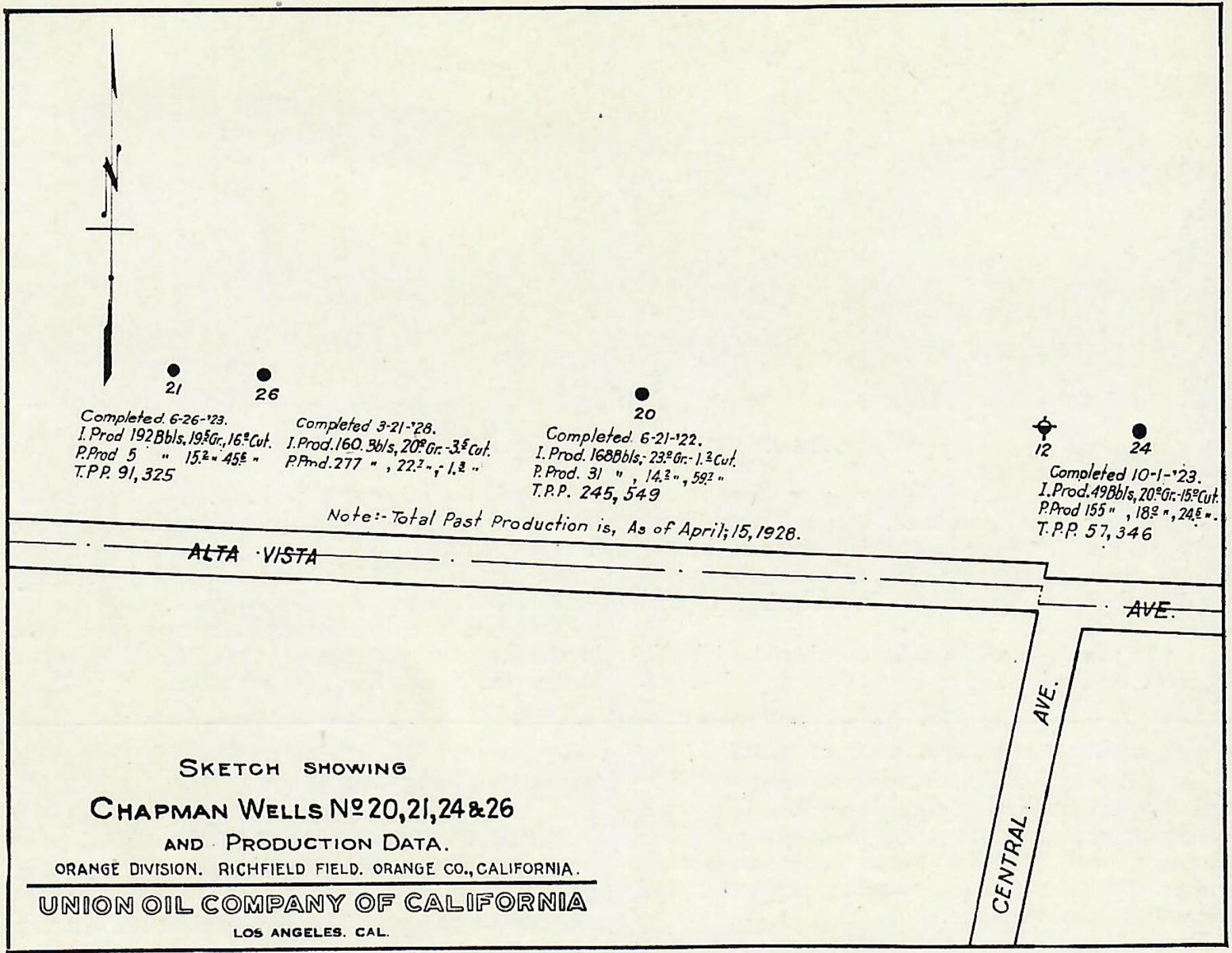
Louie Zimmerman of the Engineering Department won the cup with an average score of 212 for the three games. J. P. Varner of the Field Department was a close second.

COMPANY TRACKMEN TO DISPLAY WARES

An industrial track meet will be held at the Los Angeles Coliseum on the afternoon of June 23rd, and a number of local firms have already launched a rigid training schedule for their crack field men in anticipation of the coming event. Union Oil Company aspirants in the southern district held a meeting April 25th at the Belmont High School athletic field to look over our available material and discuss plans for a Union entry. A few veteran point-getters were discovered, but not in sufficient numbers to make the team as formidable as is desired. All employees in the south territory who are interested are urged to immediately get in touch with either W. H. Steele, Head Office, Bill Hopkins at Santa Fe Springs, or Mr. Condit at the Los Angeles Branch.

FRESNO EDUCATIONAL CLUB ACTIVE

A meeting in Tulare March 24th and a dance at Hanford April 14th comprise the activities of the Aristo Educational Club of Fresno since the last Bulletin report. Both affairs were largely attended and the program in each case included many interesting and instructive numbers in keeping with the club's educational policy.



NEW DRILLING PRINCIPLE TESTED

The company has been carrying on some experiments in drilling without the use of rotary mud, which has been known for many years to be extremely detrimental to low-pressure oil formations. The problem has been to be able to get wells down to the required depth in any reasonable time without the use of rotaries and mud circulation. It has now been proven in several of the Los Angeles basin fields that good wells can be successfully drilled in low-pressure formation without the use of mud.

One experiment successfully carried on by the company has been the drilling through oil sand with the rotary by sub-circulation, which is carried on with no other fluid than that which stands in the well naturally.

The accompanying map shows the location of Chapman No. 26, the well drilled with sub-circulation, in

relation to three other wells. No. 24 having been drilled with standard tools, completed May 20th, 1926. Nos. 20 and 21 completed June 21st, 1922 and July 2, 1923, respectively. The latter two were drilled with rotary and mud circulation. Even at this late date for completion, No. 26 shows for a very good producer as it has steadily increased in production since bringing it in and has a higher sustained production than the initial production of any of the other wells similarly located. The well is pumping from 4700 feet, which is nearing the pumping limit. So with the production of 250 to 300 barrels it is about all that could be expected by pumping. The well will probably be put on the gas lift later and may again surprise us with what can be done in semi-depleted territory.

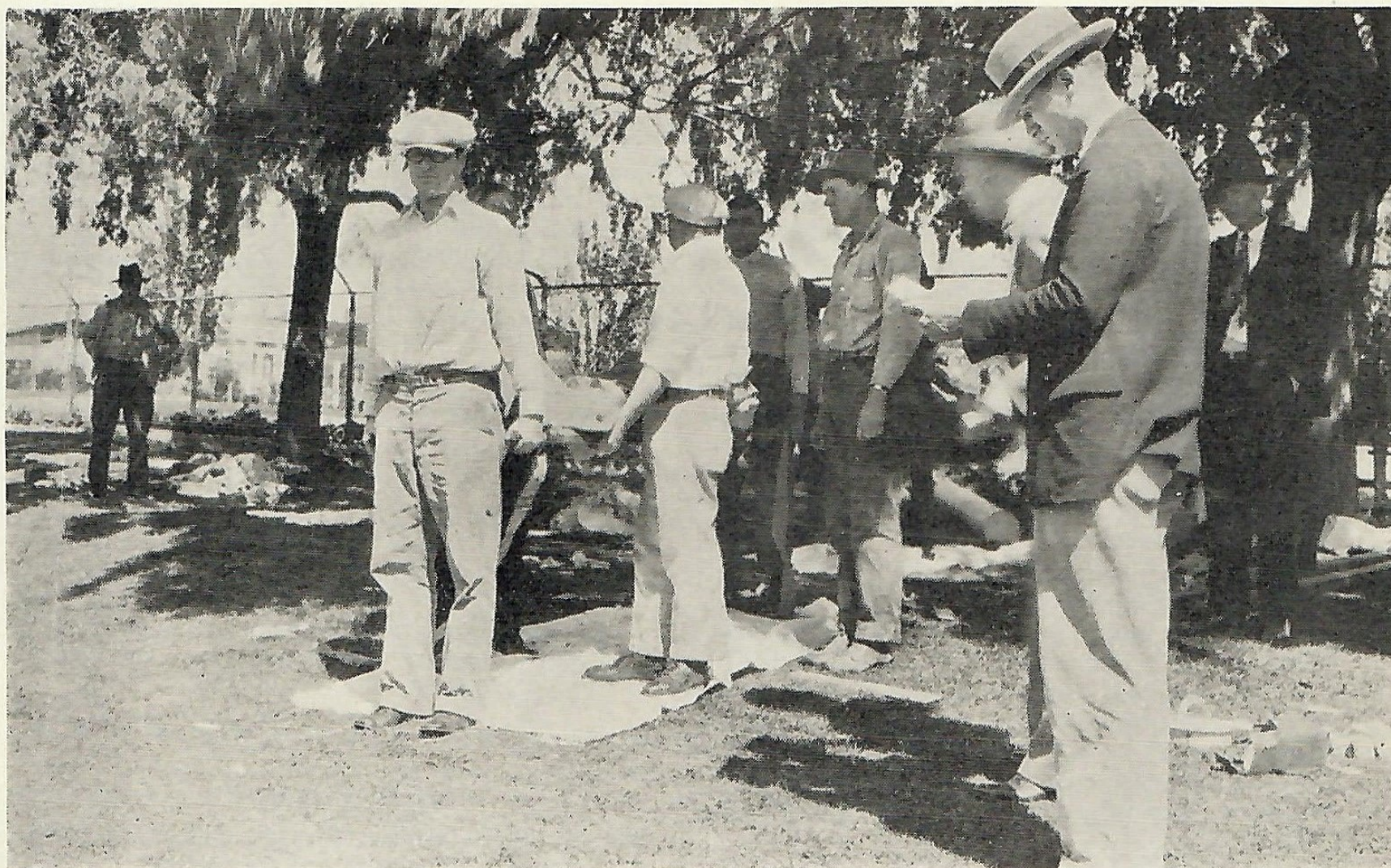
CALIFORNIA OIL

(Continued from page 9)

The total crude oil curtailment in California at the present time approximates one hundred thirty thousand barrels daily, practically all of which has been arbitrarily shut in by the major companies in order to alleviate the production situation which has caused considerable inconvenience to small independent producers. The current

shut in, incidentally, just about equals the daily average production of California during the year 1908, while the total potential production at the present time of 750,000 barrels daily, with everything wide open, is the highest recorded since September 1923, when the State could have produced 1,013,020 barrels if necessity demanded.

SAFETY IN THE UNION



FIRST AID AT OLEUM

Oleum Refinery staged its annual first aid contest on April 7, four teams being made up of men chosen from among the 33 who recently completed the first aid course with Kyle Lutz. The judging of the work was not according to the technicalities of contest rules but rather from the viewpoint of what was good for the "patient." Judges were drawn from the more experienced first aid men at the refinery.

One of the "cases" presented to the men was that of a man found unconscious and in contact with an electric wire. He had some minor injuries also, apparently due to falling. All teams did well in freeing the patient from the live wire. Some dragged it away with dry boards, others lifted it with a coat held by two men. One team went through the motions, first, of throwing a disconnect switch. The "patient" was then treated for his burns and other injuries but at least one team overlooked the fact that he was unconscious and should immediately have been given artificial respiration. Such an oversight might well have proved fatal and consequently drew a heavy penalty.

For the first time since these contests have been held at Oleum, the foremen won by a fair margin. Their work, though by no means perfect, was consistently good.

SMOKING

Three fires of human origin marked the months of March and April in the fields of the Los Angeles basin. Smoking near gassing wells by company employees caused two of these fires. The third was due to a plugged gas forge, which allowed gas to flow back through the forge blower and fill the building. Property damage was not large in any of these fires but four men were severely burned.

There is little that can be said—in print—about smoking at flowing wells. Write your own editorial.

The drilling and producing fields have slowly but surely developed an interest in accident prevention which is now demonstrated each month in the bulletin of personal injuries. During March the following reported no lost-time accidents: C. H. Sherman, Colorado and Wyoming; E. C. Critchlow, Coast Division; A. H. Brown, Orange Division drilling and shop forces; A. C. Rubel, Dominguez and Rosecrans producing forces, C. L. Woods, Valley Division and G. W. Gosline, Ventura Division.

The time is coming when the entire drilling and producing personnel will go through a whole calendar month uninjured. Such records reflect credit on the Superintendents and men. The safety men—Johnson in Colorado, Delaney in the Southern Fields and Gluyas in the Valley and on the Producers Pipe Line—ask no credit. To them a clean record is worth more than a whole sump full of apple sauce.

"I DID NOT THINK"

The ex-flapper having just secured a job on a newspaper was told to "cover" the inquest over the body of the town drunkard who had suddenly died of a drink of moonshine. When she returned to the office the editor asked for the verdict. "Oh," said the new reporter, "they looked the man over and then passed the buck to poor old God."

And we do the same thing every time we shrug our shoulders at what we please to call an "act of God" or "carelessness on the part of the man injured." For everything we do, to ameliorate suffering or lengthen life or make men enjoy life, eliminates to that extent what in olden times was thought to be the punishment of the Almighty. Just read the philosophical writings of the middle ages. Disease and suffering which modern hygiene has so far reduced were taken as matters of course and if whole cities were devastated by pestilence it was just too bad. "God moves in a mysterious way His wonders to perform." The intelligence that has been given him has made it possible for man himself to be the agent through whom some of these wonders have been brought to pass. So rather than pass the buck why should we not be men enough to stand up to our responsibility and say, "This thing came to pass because we did not know enough to prevent it or, knowing, did not act?"

Hundreds of accident reports cross my desk every year and on each some one has tried to answer the question, "How did this thing happen?" If I were writing an accident report form I would ask but two questions and they would be, first, "How could this have been avoided?" and second, "Why was it not?" Those are the questions that consciously or unconsciously every safety man is ever asking himself. And wherever you find a group of men, either large or small, that can work month after month in safety, you will find men who believe in their own ability to avoid accidents.

"Carelessness" is a poor word to apply to the mind of a man who is hurt through his own acts. Does not a man care whether he is cut, bruised or burned? Try it on yourself and see how quickly you resent the implication. "Did not think" is much nearer the truth and if you go farther and can learn why he was not thinking you will make some amazing discoveries. A railroad engineer of twenty years experience runs past a signal and crashes into a standing train. "Carelessness?" Anything but that; his whole life has been devoted to the care of his passengers. But that morning his happiness was shattered by a tiff with his wife and he left home without his breakfast. Resentment, humiliation and hunger gnawed at his vitals and his mind was filled with thoughts far removed from his work and the security of his passengers.

We must do more than provide safeguards about dangerous machinery if we are to have any success in accident prevention. We must tackle the problem at its source, in the attitude of the man on the job. No matter how a man earns his living, it is his mental makeup that determines his success. If he is happy, if he "gets a kick" out of every minute of the day, he will advance. But if he is sour and hates the world, look out for him. No man will want him for a buddy or a neighbor and he will finally prove his own worst enemy.

If I have learned anything about promoting safety in an oil company it is this, that you must make men want to play the game with themselves, their families and the company they work for. And everything which helps to create that frame of mind is just one more step toward success.

SAFETY ON THE ROAD

In a bulletin issued by J. W. Sinclair, Supervisor of Automotive Equipment, Sales Department, the following comment is made:

"In one Division, it is at the present time the practice immediately to suspend from service any driver involved in an accident pending a detailed investigation as to whether or not he is at fault. If the driver is not at fault he is immediately reinstated. If he is found to be at fault, disciplinary action commensurate with the seriousness of the accident is taken. It is interesting to note that presumably as a result of this course of action they have reduced the total number of accidents as compared to the preceding quarter approximately 60%, and this Division is now lowest in the Sales Department with respect to the number of accidents in which Union Oil Company motor vehicles are involved."

It is interesting to examine into the causes of accidents involving Sales vehicles. During the first quarter of 1928 there were 161 accidents reported. These Mr. Sinclair classifies as follows:

	NUMBER	PERCENT
Personal Carelessness	33	20
Passing	32	20
Street Crossings	27	17
Traffic	22	14
Skidding	9	6
Parking	8	5
Defective Equipment	5	3
Fires	4	2
Bad Roads	4	2
Street Cars	1	1
Unclassified	16	10
	161	100

SAFETY FLAGS

The contest for the green safety flags goes on with much interest. For the first three months the record stands as follows:

CONTESTANT	JANUARY	FEBRUARY	MARCH
Oleum Refinery	Won	Won	Lost
Los Angeles Refinery	Lost	Lost	Won
Producers Pipe Line	Lost	Won	Won
L. A. Pipe Line	Won	Lost	Won
Engineers			
Brea	Won	Won	Won
Dominguez	Lost	Lost	Lost
Oleum Refinery	Won	Lost	Lost
Los Angeles Refinery	Won	Won	Won
Seattle and Canada	Lost	Lost	Won
San Francisco	Won	Won	Lost
Los Angeles	Won	Won	Won

NOTE: A tie indicates that both contestants went through the month without a single lost-time accident.

NERVE AND PREPAREDNESS

Usually it is a truck or car on the road saved by one of the company drivers, using his one-quart tetrachloride gun, that proves the value of the thousands of fire extinguishers maintained by Union Oil Company. Recently, however, L. S. Smith, Tank Truck Salesman, saved a customer's service station from destruction at Oakland. Someone lighted a match under the vent from the underground storage tanks while Mr. Smith was making a delivery of Union gasoline. Preparedness on the part of the company and quick, cool action on the part of Mr. Smith made it possible to extinguish the resulting blaze in a few seconds.

California Oil Statistics, March, 1928

PRODUCTION

(Figures of production and stocks are in barrels of 42 Gals)

DISTRICT	BARRELS PER MONTH		DAILY AVERAGE	
	Mar., 1928	Feb., 1928	Mar., 1927	Feb., 1928
Kern River	800,486	25,822	27,176	13,097
Mount Poso	529	17	107	167
Round Mountain	4,360	141	95	—
McKittrick	153,379	4,948	4,841	5,147
Midway-Sunset	2,505,747	80,831	80,627	88,644
Elk Hills	1729,064	23,518	24,396	33,463
Lost Hills-Belridge	126,529	4,082	4,406	4,869
Coalinga	602,098	19,423	19,542	19,620
Wheeler Ridge	28,028	904	953	1,118
Watsonville	1,782	57	57	58
Santa Maria	199,760	6,444	6,533	4,890
Summerland	3,900	126	126	132
Goleta	6,267	202	325	272
Rincon	31,924	1,030	421	—
Ventura Avenue	1,587,917	51,223	53,348	51,041
Ventura-Newhall	176,043	5,679	6,056	6,003
Los Angeles-Salt Lake	48,080	1,551	1,603	1,772
Whittier	53,285	1,719	1,722	1,928
Fullerton (Brea Olinda)	484,702	15,636	17,096	24,278
Coyote	423,792	13,671	13,833	14,166
Santa Fe Springs	1,165,095	37,584	37,905	43,338
Montebello	385,612	12,439	13,035	16,337
Richfield	600,465	19,370	19,948	20,559
Huntington Beach	1,756,003	56,645	57,951	77,670
Long Beach	3,877,311	125,075	118,486	94,623
Torrance	590,393	19,045	19,560	24,263
Dominguez	389,876	12,577	12,692	18,255
Rosecrans	209,136	6,746	7,489	10,858
Inglewood	933,143	30,101	30,708	37,241
Newport	102	3	22	40
Seal Beach	1,243,424	40,110	40,957	26,012
Potrero	92	3	—	—
TOTAL	19,118,324	616,720	622,016	639,862
February	18,038,459	622,016	—	—
Decrease	1,079,865*	5,296	—	—

*Increase

STOCKS

	Mar. 31, 1928	Feb. 29, 1928	Mar. Stock Decreases	Mar. 31, 1927
Heavy Crude, heavier than 20° A. P. I., including all grades of fuel	95,880,671	96,239,379	358,708	90,232,297
Refinable Crude, 20° A. P. I., and lighter	20,215,802	20,676,318	460,516	29,500,917
Gasoline	13,799,947	13,267,767	*532,180	14,571,992
Naphtha Distillates	1,633,736	1,845,109	211,375	4,058,974
All Other Stocks	9,268,718	9,187,790	*80,928	10,003,875
TOTAL ALL STOCKS	140,798,874	141,216,363	417,489	148,368,055

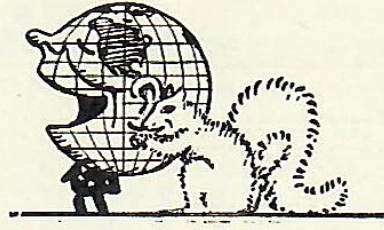
**Decrease

DEVELOPMENT

	DEVELOPMENT			Daily Initial Output	Active Producing	Abandoned Wells	
	New Rigs Up	Active Drilling	Completed			Drillers	Producers
Kern River	11	15	18	3,336	1,416	1	..
Mount Poso	4	1	2	1,000	3	..	..
Round Mountain	..	5	2	1,200	4	2	..
McKittrick	..	1	1	5	295	..	..
Midway-Sunset	5	6	4	832	2,841	1	4
Elk Hills	..	..	..	..	225	..	..
Lost Hills-Belridge	..	1	1	50	308	..	..
Coalinga	1	3	..	..	985	..	..
Wheeler Ridge	..	2	..	..	31	..	..
Watsonville	..	..	..	..	6	..	..
Santa Maria	1	4	..	..	224	..	..
Summerland	..	1	..	..	91	..	..
Goleta	1	..	..	..	3	..	..
Rincon	..	14	1	1,350	4	..	..
Ventura Avenue	..	26	3	5,530	112	..	..
Ventura-Newhall	4	17	..	..	508	2	..
Los Angeles-Salt Lake	..	..	..	..	333	..	..
Whittier	..	..	..	..	179	..	..
Fullerton	..	6	..	..	381	..	..
Coyote	1	1	..	..	210	1	..
Santa Fe Springs	..	1	..	..	308	..	..
Montebello	..	2	..	..	175	..	1
Richfield	..	9	2	100	259	..	2
Huntington Beach	8	14	6	438	576	..	6
Long Beach	28	174	11	20,938	647	2	8
Torrance	..	1	..	..	649	..	1
Dominguez	1	4	..	..	74	..	..
Rosecrans	..	1	..	..	111	..	2
Inglewood	1	..	2	325	221	..	..
Newport	..	1	..	..	2	2	8
Seal Beach	1	2	2	249	133	..	1
Potrero	..	1	..	..	1	1	..
Miscellaneous Drilling	8	145	..	..	..	8	..
March	75	458	55	35,353	11,315	20	33
February	87	458	70	40,333	11,299	12	22
Increase	12**	..	15**	4,980**	16	8	11
Average for year 1927	97	404	75	39,992	11,276	23	21
Average for year 1926	95	422	76	32,635	11,288	24	17
Average for year 1925	105	417	79	42,247	11,393	28	12
Average for year 1924	103	510	103	42,412	10,903	28	21
Average for year 1923	111	759	82	114,690	8,928	..	24

**Decrease

REFINED AND CRUDE



Excitement pervaded the atmosphere, but most of us were so intent on our own particular problems, we were just vaguely conscious of it.

* * *

Until Lindy crept up close and uttered a loud "Woof!" in our ears.

* * *

Immediately we were startled into a realization of the fact that flying had ceased to be a stunt, and had become a sound commercial enterprise.

* * *

Now even the veriest skeptic will concede that the flying business is holding up.

* * *

And another air lift problem has been solved.

* * *

From the meandering horse and buggy to the three-hundred-mile-an-hour airplane is a long step, and yet it seems only yesterday that Washington took a hack at the cherry tree.

* * *

Speaking of speed—don't allow your children to try out for the track team, or they are sure to get in with a fast bunch.

* * *

Incidentally, the Scotchman, who spent ten dollars on his girl in one evening, has explained the matter very satisfactorily. That was all she had.

* * *

The way to success does not necessarily lie through college. Dishwashers clean up thousands every day.

* * *

And invariably get all the breaks.

* * *

Then again, if you are writing a story for the Bulletin, and find the task tedious and slow, don't be discouraged. Many a man has taken twenty years to finish a sentence.

* * *

In the oil industry we seem to have applied our efforts so successfully to the problems of production that our present markets are entirely inadequate.

* * *

The remedy lies in the development of new markets, and the manufacture of new products from the same raw material.

* * *

The recent short period of over-production brought these facts very forcibly home to us, and stimulated an intensity of competition that has roused the fighting spirit of every man in the industry.

There is no room in this battle for the fellow who is just sliding along. He should be in the orchestra—playing a trombone.

* * *

California is supposed to be a comparatively new country, but we read in the Scripture "The lightning flashed. The thunder roared, and the rain came down in Torrance."

* * *

A poor divot remover was wont to flip a coin every Sunday morning, to decide whether he should play golf or go to church.

* * *

And often would be required to flip it twelve or fourteen times before he could leave for the golf course.

* * *

Then there was the absent-minded individual who put a dozen golf balls under a setting hen, and hatched out eight birdies and four eagles.

* * *

Gasoline, according to Bruce Barton, has greatly and wonderfully changed the life of the present generation.

* * *

He gently chides the American oil men in the following words: "It is health. It is comfort. It is success. And you have sold it merely as a bad-smelling liquid at so many cents a gallon."

* * *

He asks us to exercise a little imagination and put ourselves in the places of the men and women in whose lives our gasoline has worked miracles.

* * *

And all the time he forgets that we oil workers have chariots ourselves and we therefore glean this information first hand.

* * *

A fine reading course for the first-aid classes would be Carlyle's "Essay on Burns."

* * *

But can you imagine a man naming his child Montgomery Ward simply because it was of the male order?

* * *

One of our dock workers recently ran into a Chinaman and bumped him pretty badly, but we understand it was purely occidental.

* * *

Don't throw rubbish or waste around the oil tanks. That's offal.

* * *

The excellence of paint as a preservative is demonstrated in the fact that women live longer than men.

Desert Phantoms

By N. R. A. BECKER

Dusk upon the desert; silence, awe inspiring,
Shrouds the world in mystery, imagination firing.
Shadows from mesquite and sagebrush rise gigantic, eerie,
Casting gloom o'er all the scene, desolate and dreary.

On the distant horizon warped and stunted trees
Bend as though before the blast of some phantasmal breeze;
Yet no breeze is stirring, no single breath of air
Moves o'er all the desert, desolate and bare.

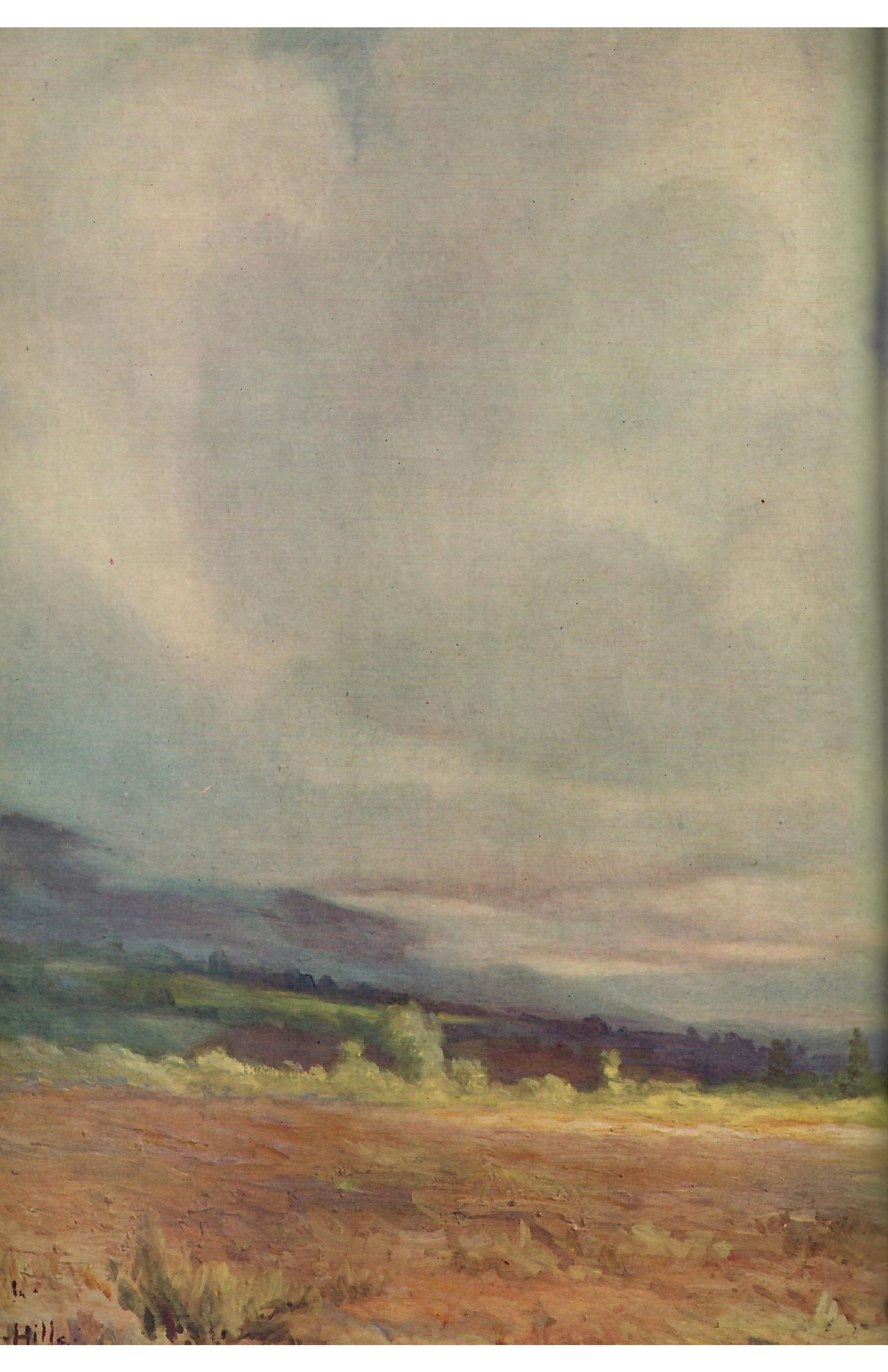
From the long-dead ages, through the mists of time,
Phantoms rise and pass again in spectral pantomime;
Ghosts of long-dead pioneers, shades of Indian braves,
Rising from the dreariness of their desert graves.

Men who trod the wilderness years on years ago,
Men who forged an empire, painfully and slow—
These I see before me, on the desert stage,
Trooping through the cactus, through mesquite and sage.

Shades of the distant past, stirring an unnamed fear,
A dread of the desert's challenge, silent, grim, and near;
A dread of the desert's defiance, a dread of its lurking death,
That springs from the arid waste, that rides on the hot
wind's breath.

* * *

Dusk upon the desert, silence over all;
And the whole world cloaked in mystery—
And the desert's siren call.



Hills