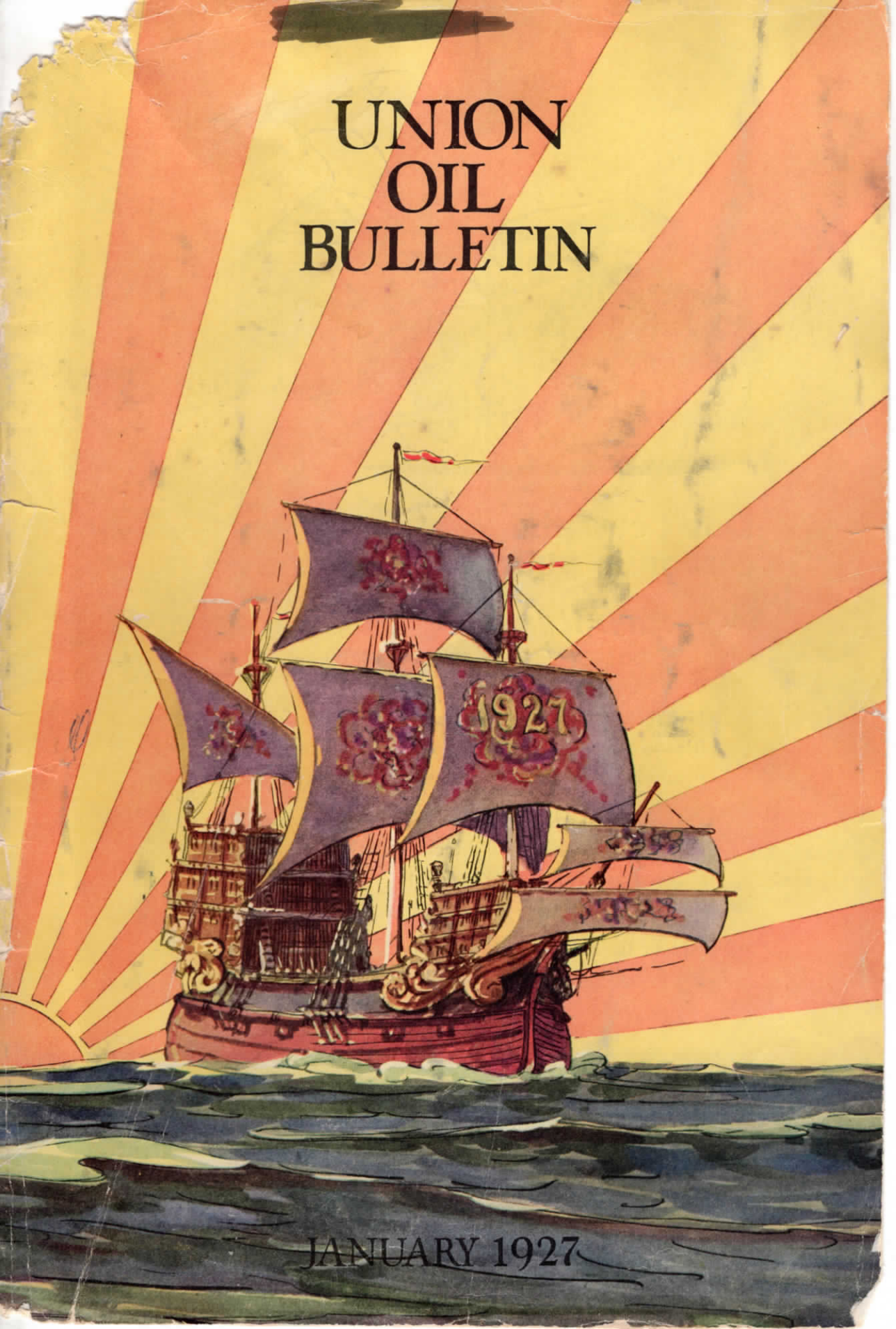
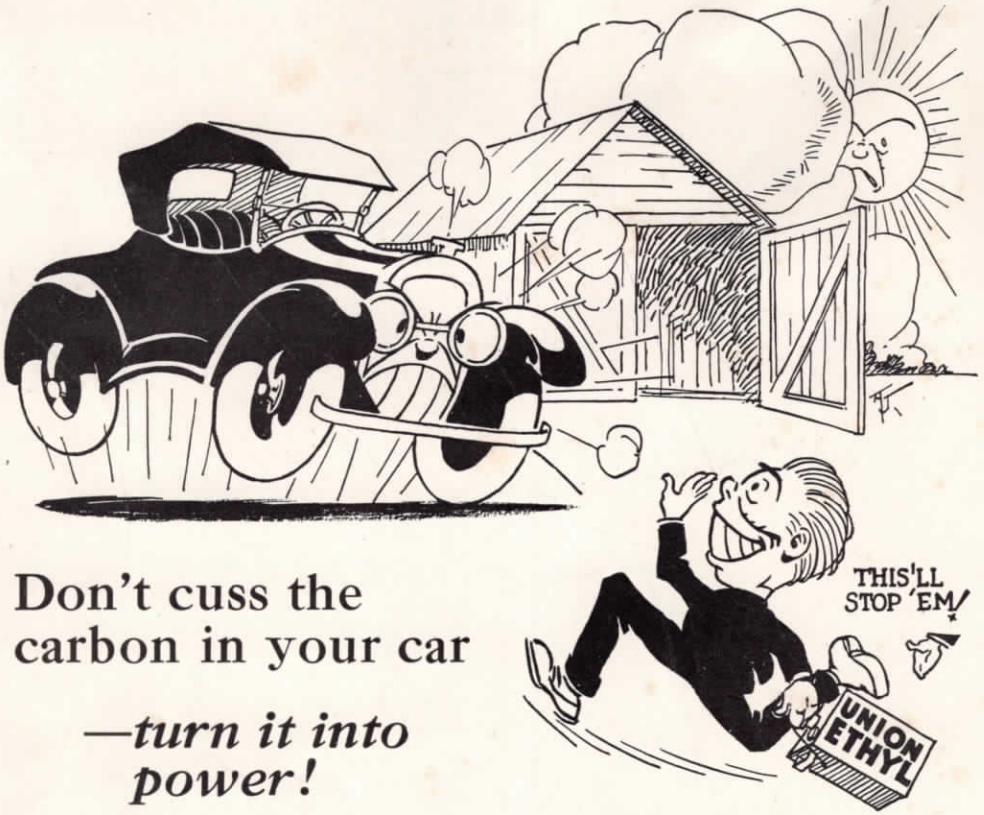
UNION OIL BULLETIN



JANUARY 1927



Don't cuss the carbon in your car

—turn it into power!

Up to now, carbon has been the cause of most driving ills—a sluggish motor, slow pick-up, loss of power and "knocking" when you take a hill in high.

NOW, with Union Ethyl Gasoline, you can not only neutralize the harmful effects of carbon, *but actually turn it into a source of greater power.*

The first tankful of Union Ethyl Gasoline will convince you of its magic properties. It has no substitute—nothing is comparable to it. Fill your tank today.

Stop that "knock" with Union Ethyl Gasoline *and turn* carbon *into* power

UNION OIL BULLETIN

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The Year in Review

The year nineteen hundred and twenty-six has been an outstanding one for the company in many respects. Not only has it witnessed a tremendous expansion in potential oil properties, the development of which will be reflected in future years, but there has been a decided tendency toward economical extraction of oil through the utilization of more efficient methods and equipment. The gas lift process, which was developed by the company, and which makes possible the recovery of what might be termed "lost oil", has caused a revision in the production figures of proven and developed fields.

Extensive improvements and additions to refineries have been made. The installation of the Edeleanu process has made possible the manufacture of a kerosene from asphalt base crudes that is superior in quality to oils refined by conventional methods. During the year, four two-thousand-barrel capacity Cross cracking units were installed at the Los Angeles Refinery.

During the twelve months the company expanded its marketing system to include Northern British Columbia, Alberta, Alaska and Mexico.

Late in the year, the company started marketing a new super-fuel under the name of Union Ethyl Gasoline. Characteristics of this gasoline are the elimination of the so-called "carbon knock" in the motor, greater motor flexibility, lightning pick-up and increased power. The great sales volume of this new gasoline testifies to its warm reception by Western motorists.

The company faces the beginning of a new year bulwarked with four lines of reserve in production. The first of these is its California holdings, represented by large parcels of proven oil land in the Los Angeles basin and the Santa Maria district. The second is the Colorado and Wyoming fields which have shown great promise during the year. The huge shale deposits in Colorado owned by the company, and which are second only in area to those owned by the United States Government, constitute the third line of reserve. The fourth, and probably largest and most important reserve, was established three months ago when the company acquired approximately 900,000 acres of potential oil lands in Venezuela.

Production of "Cracked" Gasoline

By LELAND L. REBBER
Supt. of Cracking Operations
Los Angeles Refinery

WHAT a shock it would be to see a large quantity of gasoline purposely pumped to a waste sump and burned. Yet such was common refinery practice years ago. Modern demand for rapid transportation has changed all this and the once despised and dangerous fluid is now harnessed to most useful service in the internal combustion engine. The demand for gasoline now places this commodity in a leading position, usurping the prized place held by kerosene during the days preceding the general use of the gasoline engine. In fact, for several years past it has been quite a problem to supply this demand created by the millions of automobile, motor boat, and airplane engines from the quantity of gasoline contained in the natural crude oils produced in these United States. Service stations are, however, still dispensing the necessary material and at moderate prices. Such has been made possible through application of the art of "Cracking."

During 1925, refineries in the United States produced almost eleven billion gallons of gasoline of which it is estimated that from two and one-half to three and one-half billion gallons were derived from cracking operations.

Petroleum is a mixture of compounds of the two elements carbon and hydrogen. The generic or family name applied to these is hydro-carbons. The physical and chemical characteristics of the compounds vary both with the number of parts of carbon and hydrogen associated together in each chemical unit of the compound and with the arrangement of the same in the molecule or unit aggregate. As an example one of the simplest compounds associated with petroleum is methane, a fixed gas which contains in each molecule one atom of carbon and four atoms of hydrogen. This simple compound has a boiling point of minus 243 degrees Fahrenheit, i. e., it is a gas unless maintained at a temperature of 243 degrees below zero. In the heavier fractions of petroleum there are compounds containing many parts of carbon and hydrogen banded together in intimate chemical combination and these heavier hydro-carbons boil or vaporize only at elevated temperatures. Thus the lighter compounds containing fewer units of carbon and hydrogen associated together are more volatile, i. e., they boil and become vapors at lower degrees of heat. Between the two extremes above cited are found the group of compounds boiling at temperatures between 100 and 400 degrees F. approximately, which compose the hydro-carbon mixture known commercially as gasoline.

The scientific fraternity has long known that complex hydro-carbons could be dissociated or broken up into simpler ones by subjection to heat. If extreme heat were applied the compound reverted to its elements, carbon and hydrogen. If less severe treatment were used such simple hydro-carbons were formed in large proportion as methane and related gases, which are thus produced at gas plants that manufacture gaseous fuel for home consumption in furnace and range. Further reduction in severity of heat treatment resulted in production of more liquid hydro-carbons of low boiling point and less gas and carbon. However, under any condition as above some carbon and gas is always produced although the amount varies with the intensity of cracking or dissociation. To produce light hydro-carbons (gasoline) from heavy ones (kerosene, gas oil, or fuel oil) heat

An Interesting Example of Carbon Deposition. This Frequently Occurs on the Thermometer Wells in a Liquid Phase Cracking Still. The Etching of the Carbon Surface is as Delicate and Beautiful as a Winter Frost Crystal.

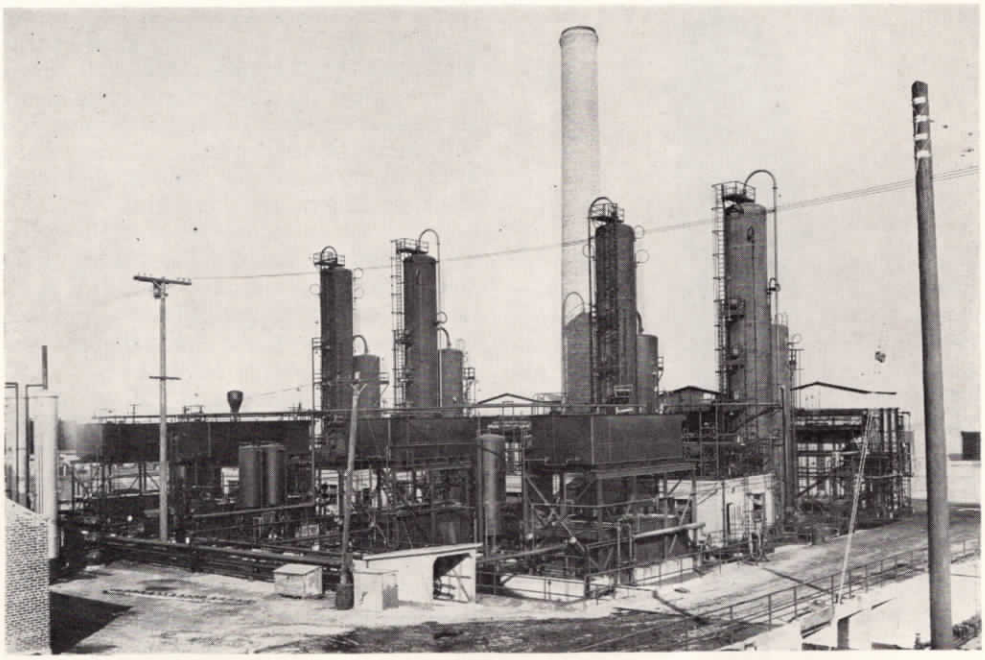
must be employed to set up sufficient internal energy within the molecular body of the latter to disrupt or shatter it.

To produce gasoline by cracking, conditions of heat must be maintained so that a high recovery of desirable liquid constituents of low boiling range is possible, yet with the minimum yield of the undesirable fixed carbon and gas. This problem might be compared to that of breaking a large slab of rock into sizeable pieces with a hand sledge. If light blows are given nothing is accomplished except a chipping of the surface; if well timed and properly placed medium hard blows are used the rock is broken into some fine and some sizeable pieces; if very hard blows are given the slab is shattered. Thus in commercial "cracking" conditions are set up as near as possible to follow a middle course, dissociating sufficiently to give a reasonable yield of gasoline, yet not so energetically as to produce large quantities of the end products, gas and coke.

Many experimenters in Europe were working on the development of "cracking" processes before the advent of the art in the United States. Commercial application was not undertaken seriously in this country until about 1912 when Dr. Wm. Burton of the Standard Oil Company started what is now known as the Burton Process. In this, heavy petroleum distillates were distilled under pressure whereby the oil was subjected to temperatures of 750 to 800° F. The stills consisted of cylindrical shells mounted over a firebox or furnace, and were equipped with a safety valve, pressure gauge, and thermometer. A pipe connected the top of the still to a coil immersed in water, which latter affected the cooling and liquefaction of the light products distilled from the body of oil maintained in the still. A valve placed on the end of the cooling coil served to maintain pressure on the system, which was normally about 75 pounds per square inch.

By holding a pressure on the body of the oil sufficiently high temperatures could be had to cause dissociation or cracking. The use of pressure was hazardous and only by great advances made in the construction of strong steel vessels and unlimited faith and perseverance on the part of Dr. Burton and his colleagues was pressure distillation made a commercial possibility. To illustrate the rapidity of development it is reported that the production of "motor spirits" by the Burton Process had attained the total figure of 126,000,000 gallons a year, by 1916.

The production of carbon which inevitably accompanied cracking caused serious difficulty in maintaining even heating and freedom from overheating of the steel cracking stills, endangering equipment



Photograph of a Modern Cracking Plant Installation Equipped with Self Contained Distilling Apparatus for Recovery of Cracked Gasoline. This Type of Process Operates at Pressures of over 600 Pounds per Square Inch.

and the lives of the workmen. In an effort to overcome carbon troubles many new processes were developed permitting the use of the three factors essential for cracking—temperature, pressure, and time.

Some success was had with the so called vapor phase processes, where vapors of heavy petroleum distillates were subjected in pipe coils to high temperatures to produce cracking. However, ever present carbon troubles together with greater dissociation to fixed gases directed more and more investigators toward liquid phase cracking. The desire to crack lighter distillates as well as the heavy ones gave considerable impetus toward the use of higher pressures, whereby the oil in the stills could be more nearly held in a liquid condition and higher temperatures could be employed.

Cracking stills which embodied the use of heating (pipe) coils suspended in a fire box and large shells or stills insulated but not heated from the outside were then developed. These had certain advantages since more uniform heating could be accomplished and the large drums could not be overheated and were therefore much safer. With the use of such equipment and the great improvement in the manufacture of steel and steel vessels, pressures in use in some of our modern installations amount to as much as 1000 pounds per square inch. With higher pressures all types of oil can be and are handled. More uniform heating is accomplished with less production of the end products, carbon and gas. The carbon that is formed is largely collected in the insulated shells or "soaking" chambers, from which it is periodically removed.

Vessels for pressure still work are made only from the finest grades of steel and vary in wall thickness from 2 to 4½ in. depending on the working pressures desired. Soaking chambers for low pressures, 150 to 350 pounds per square inch, are commonly made of riveted steel plates measuring up to 2 inches in thickness; those used for pressures to 500 pounds are now made of sheet steel 3 to 3½ inches in thickness by electric welding which is so ingeniously accomplished as to give greater strength at the weld than in the virgin metal; others for service at

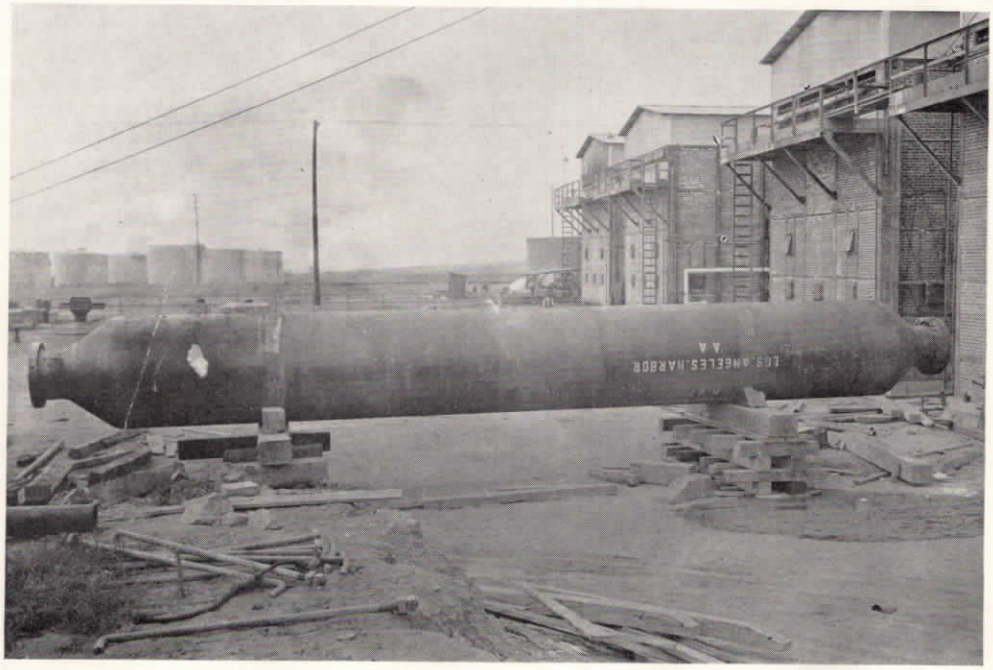
600 to 1000 pounds are made as solid gun forgings measuring 4½ inches or more in wall thickness.

In the early use of the tube and tank principle for production of cracked gasoline it was common practice to accumulate the liquid material withdrawn from the still (synthetic crude oil) and redistil this in standard refinery equipment to recover the cracked gasoline. The latter was then chemically treated and refined to yield a finished commercial "motor spirit." In modern practice the distilling equipment has been incorporated with the cracking still and each unit produces a synthetic crude which is continuously separated into cracked gasoline, an intermediate fraction similar to the original charge and a heavy cut resembling fuel oil. In some localities treating equipment has been added so that the gasoline is recovered as a finished product without independent treatment.

All grades of petroleum can now be cracked and ultimate yields of gasoline obtained ranging from 40 to 70% of the original oil. Present production of straight run gasoline from natural crude oil is augmented with sufficient cracked gasoline to meet present day demand. As the demand increases and production of crude decreases more and more of the heavier portions of petroleum will be cracked and our automobiles will continue to run.

Cracked gasolines have certain characteristics peculiar to themselves. A cracked gasoline, volatilizing at the same temperature as a straight run (natural) product will have a lower A.P.I. gravity, which is in no way a detriment. The cracked or synthetic product contains more of the hydro-carbons answering to the family name of "aromatics" which are well known for their ability to withstand higher motor compression without detonation than ordinary gasoline.

The "cracking" art is young but as a healthy part of the great petroleum industry is growing rapidly. The impossible of yesterday is common practice tomorrow. High working pressures of 15 years ago are dwarfed by present accomplishment and mechanical ingenuity places safety hand in hand with progress.



A Cracking Still Reaction Chamber made from a Solid Steel Gun Forging. This is 44 Feet in Length, 5 Feet in Diameter and 4½ Inches Thick and is made for Service at Pressures of 1000 Pounds per Square Inch.

Little Red Riding Good and the Wicked King Knock

A Bedtime Story by B. Z.

ONCE upon a time there were two great countries side by side. One was called Motoria, and the other was known as the Land of Deto. These two countries were inhabited by peoples with entirely different habits and customs, and entirely different ideas.

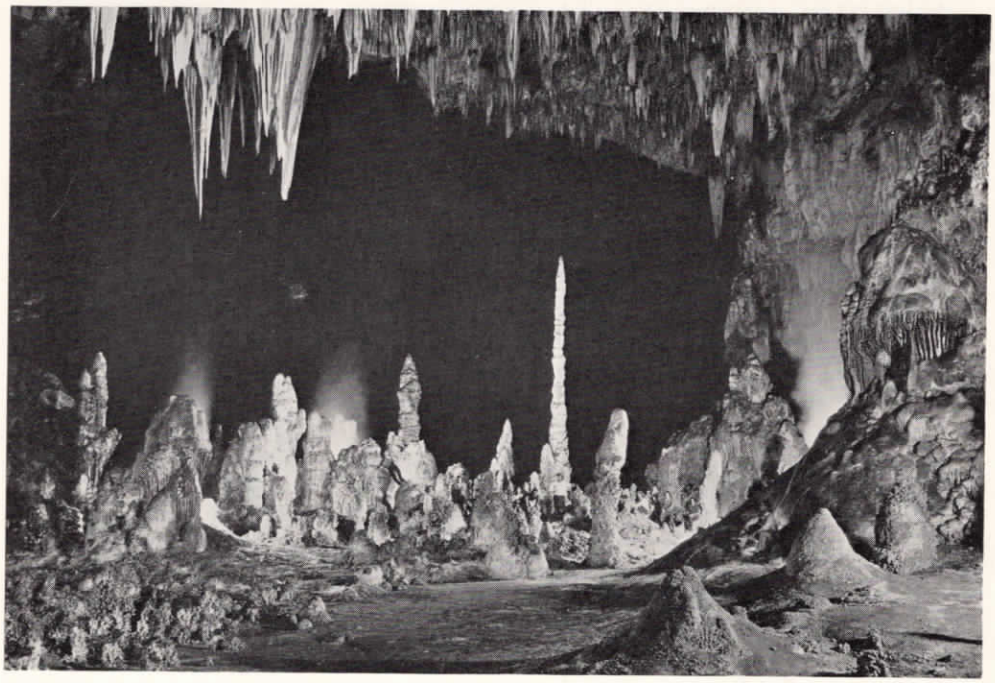
The Motorists, or natives of Motoria, were a bright, intelligent people, who lived in a quiet peaceful manner, and went about their business in a smooth running and efficient way. They were consequently able to accomplish a great deal of good work, and they prospered accordingly. They lived on the open highways all the year round, and owed their success to the influence of a beautiful queen named Ethyl who had been sent to them by the wise men of the East. Ethyl was greatly beloved of her subjects, and in fact the greatest pleasure of these excellent people was to ride with her in their beautiful sedans. For some reason they found that her presence made these rides much more enjoyable, and they never missed an opportunity to pick Ethyl up on the way. Invariably on these jaunts, Ethyl wore a becoming little red dress, and for this reason she became familiarly and lovingly known to Motorists as Little Red Riding Good.

The Deto nation on the other hand was a tribe of destructive, quarrelsome, and ignorant people, who were intensely jealous of the prosperity and power of their neighbors. They lived mostly in repair shops, and were the last survivors of an ancient uncivilized race that had been gradually reduced by the advance of science, but they were still sufficiently numerous to be very troublesome and to retard greatly the progress of the Motorists.

The Dets, as these people were called, were ruled by a wicked old tyrant—King Knock, and very often, incited by his favorite henchman, C. Arbon, this old gladiator would work himself into frenzies of red hot rage, during which spells he took a maniacal delight in the destruction that resulted from his actions. Both King Knock and C. Arbon were greatly encouraged in their efforts by a stupid chit of a girl, Miss Understanding, who had a tremendous influence over the pair. Under such a leadership it can be readily understood that the Deto nation was anything but a desirable neighbor, and the clamor and futility of its orgies were a constant source of worry and annoyance to Ethyl, and the Motorists.

Now, while Little Red Riding Good and her subjects were essentially a peace loving people, they soon realized that the depradations of the mischievous Deto, were a serious detriment to their own progress, and the beautiful Ethyl, therefore, issued a proclamation, calling all the motorists to a gigantic assembly. On the appointed day, the entire population of Motoria gathered in a huge circle around the dais on which sat the royal family. In the center of the raised platform sat Ethyl herself, resplendent in her red robes, and on either side sat her cousins—Tetra, the warrior, and the fair Ethyl Dibromide, who had always been of invaluable assistance to Tetra in his battles against the Deto nation. The menace of King Knock and his tribe of marauders was very seriously and very thoroughly discussed, and Tetra was finally chosen to guide the forces of Motoria in a final assault against these destroyers.

Followed by his tribesmen, Tetra advanced on King Knock, fully expecting to be engaged in a terrific battle, but strange to say the wicked old King vanished completely into thin air at his approach, and as Tetra continued his triumphant march, the entire Deto nation, by some peculiar and mysterious means, completely disappeared, so that now the two countries are under the domain of the beautiful and good Ethyl, and the wicked old King Knock has been long forgotten.



The Totem Poles, so named because of their resemblance to those of human design are the most beautiful stalagmite formations in the cavern.

CARLSBAD CAVERN

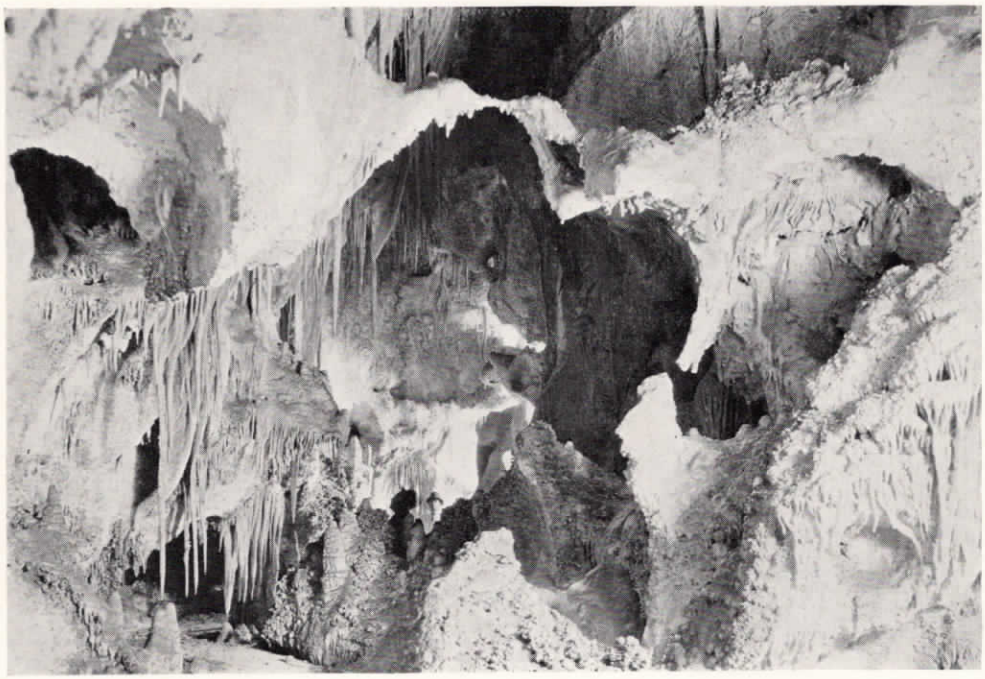
by William E. Lynd
Captain, Air Service, U.S.A.

In distributing her wonders among the Southwestern states, Mother Nature overlooked not one. New Mexico, in which Union Oil Company has extensive land holdings, boasts of something "a little different" in the caves at Carlsbad.—The Editor.

CARLSBAD CAVERN is twenty-six miles from the city of Carlsbad, New Mexico. The entrance to the cavern is through a large archway into which the ground slopes at about a forty-five degree angle. Just inside the entrance is a sheer drop of some twenty-five or thirty feet to a fairly level rock-strewn floor below. Although the existence of the cavern was known to stockmen, probably since the first coming of white men to this region, no one had descended beyond this point until 1906.

From the natural opening to the extent of exploration of the main cavern is about fifteen hundred yards, during the passage of which one descends into the mysteries of the earth some nine hundred feet. The trail leads along the main passageway which winds up and down, in and round about, at times being but a passageway from one large room to another, at others, becoming a vast cavity hundreds of feet across with the rock-vaulted roof three hundred feet above.

The cavern has a calcareous incrustation lining its interior, giving it a gorgeous appearance. Sometimes this deposit is pure white, and has, when the cave is lighted up, a richness and transparency that cannot be imagined. It is, however, sometimes colored by the impurities



The Billing Doves—weird inhabitants statued in variegated stone, figures that seem to move, sway and posture in the flickering play of light and shadow.

One of the beautiful types of floor incrustations is the Lily Pad design. In many places the water has disappeared and the formations have begun to disintegrate.

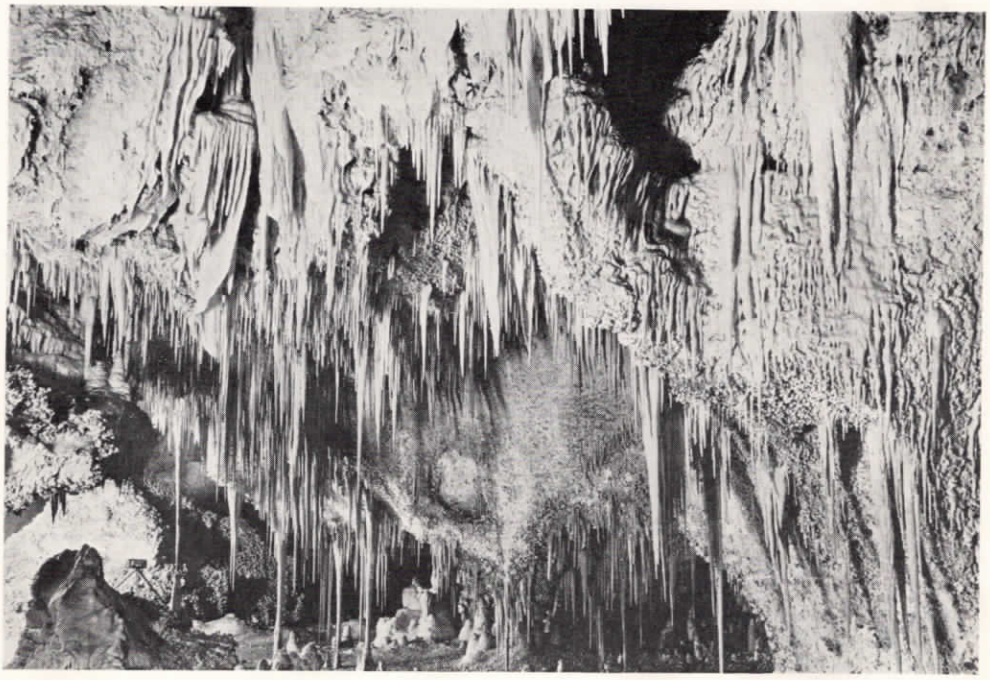
which the water has taken up from the superincumbent strata. To the incrustations which are suspended from the roof, like icicles, the name stalactite is given, while those rising from the floor are designated stalagmites. Sometimes the pendent stalactites are produced so as to meet the ascending stalagmites and form pillars, as if to support the roof.

Although stalactites of all sizes and shapes hang from the roof throughout the cavern, the most beautiful and numerous are in the Ice Chamber, so named because of their icicle appearance and form. These are small but delicately formed and hang almost to the floor; in fact, many of them have connected with corresponding stalagmites and formed thin, delicate columns of hollow marble. Stalactites produce a clear ringing note when lightly tapped, the length of the pendent varying the tone.

Stalactites in the Dome Room are of an entirely different formation. These fall in great folds or curtains of thin transparent marble. The largest of these has been appropriately named the Elephant's Ear, to which it has a remarkable resemblance. Another type of stalactite is the waterfall formation. These incrustations form along the walls where it appears as though liquid marble had been poured over an obstruction and hardened ere it reached the floor.

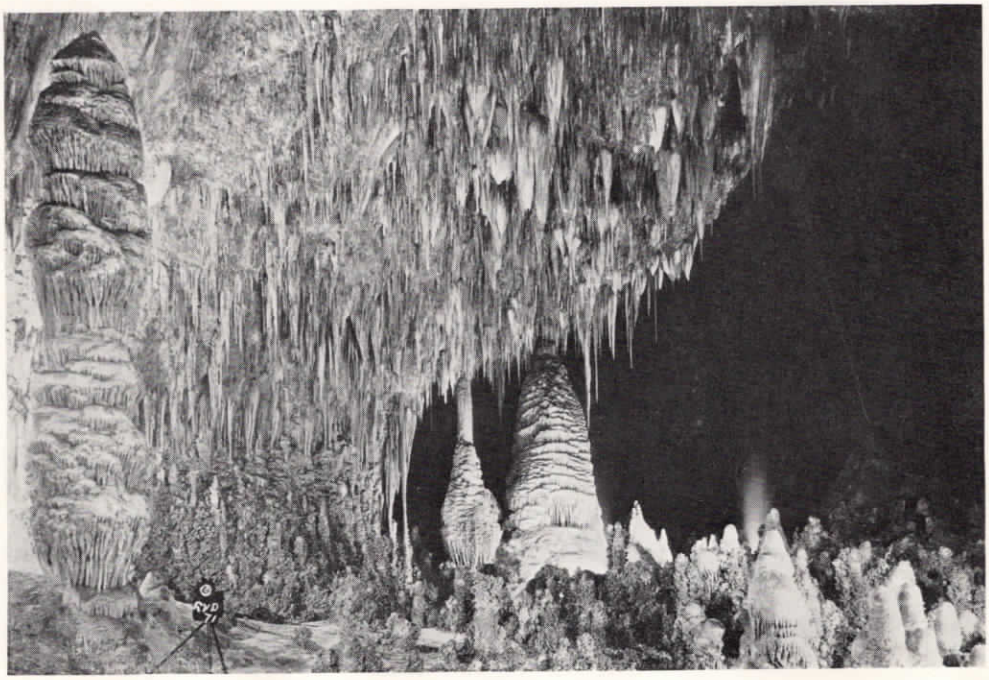
In one portion of the cave, pendent type stalactites of small diameter are so interwoven that they resemble a bird's nest. As stalactites are supposed to be formed by dripping water, it is difficult to imagine how or in what manner this peculiar formation came into existence. In another place, stalactites are so covered with what appear to be marble barnacles, that it is almost impossible to see the stalactites.

Stalagmites throughout the cavern are larger and more impressive in their beauty than the stalactites. These vary from small stubs resembling the nose of a six-inch shell to towering pillars of marble weighing hundreds of tons. These giant stalagmites rise to a height of some fifty feet and are from twelve to fifteen feet in diameter. They appear as a mighty fountain with marble instead of water flowing down over a succession of ripples.



The Ice Chamber, fittingly named, it is so realistic of the frozen north. Slender pendents of glistening marble, looking for all the world like icicles, hang in all lengths and sizes from the low ceiling.

The King's Palace is more elaborately and artistically decorated than the palace of any modern king. This is a view of the entrance.



Temple of the Sun. Lacy designs and dainty figures are intermingled with colonnades of huge proportions and fantastic forms of onyx marble.

Shinav's Wigwam. The geological formations of this room are the most elaborate and unique to be found in the cavern. Unlike most parts of the cave, floor formations are few and small, the floor of this room being level and sandy in most places.

The largest and most beautiful of these are the Twin Domes.

The most beautiful stalagmite formation in the cavern is the Totem Poles. These vary greatly in size and altitude and appear queer and unearthly by the eery light of torches. In the maze of architecture so lavishly festooning the walls and vaulted roofs which has been formed in the unriven darkness of ages past, are the styles of China and India, of the Toltecs, Incas, Greeks and Goths, but stronger perhaps, is their resemblance to the carvings of those fast vanishing peoples of the northland, weird and grotesque totems to an unknown God. As the flickering light of flares illuminates these ancient columns, one has the feeling of trespassing among the dead of a long-forgotten race.

A peculiar formation covering the floor of the cavern in places is what has been termed Lily Pads. This is a formation caused by standing water on the floor. There is no running water in the cavern and but small pools of still water. Each pool maintains a constant level which apparently never has varied. The floor incrustations form on a level with the water in a lily pad design. In some places, these are on the water level, in others the water has disappeared leaving this queer formation.

The exploration of Carlsbad Cavern has but begun. Innumerable aisles lead off in all directions, the exploration of which has never been completed. At the end of the explored portion of the main cavern, the floor takes a sheer drop of two hundred feet into black nothingness. But one man has even made this perilous descent. Jim White, the intrepid explorer of this cavern, was let down with a rope to a ledge two hundred feet below, along which he explored for a few hundred feet and saw that the floor sloped away again to dark depths below into which he did not venture. To one desiring to delve into the mysteries of the unknown, the exploration of Carlsbad Cavern offers ample opportunity with thrills and sensations assured.

Thrills in the Oil Fields

By F. F. HILL, Manager Field Operations

FEW people realize the hardships and the difficulties encountered in discovering new oil fields. Back in the year of 1917, Meyer Well No. 3 was started in what is now known as the Santa Fe Springs Oil Field.

Two wells, Nos. 1 and 2 had previously been drilled, with unfavorable results, on the Meyer's Rancho of 865 acres. Many difficulties were encountered in drilling Meyer No. 3, but by alternating between rotary and standard tools, oil was finally discovered at a depth of 4578 feet. Owing to the extreme depth and small diameter of the hole, 4½ inch casing had to be set for a water string. The well came in showing considerable production and flowed at the rate of possibly two or three thousand barrels for a few hours when water broke in. The well had to be recemented under high pressure, and when it was again put on production with the water successfully shut off, it never produced over three or four hundred barrels per day. This well, however, produced 148,281 barrels during its life time. The oil was of high gravity, and perhaps brought an average price of $2.00 per barrel. The abandonment, within the last few months, of Meyer No. 3 marks the passing of this remarkable well which gave birth to the Santa Fe Springs Field, one of the greatest in the world. Up to January 1st of this year, Santa Fe Springs has produced 153,741,803 barrels of oil together with great quantities of natural gas and gasoline.

The outstanding feature of Meyer No. 3 location is that it was practically an edge well, and had it been drilled 500 feet to the Southeast or further off structure, it would have been a failure, and possibly there would not have been encouragement enough to locate elsewhere in this vicinity. In getting a commercial well, however, incentive was furnished for further drilling. The next location was selected by geological experts on the Bell property where No. 1 was drilled, approximately two miles northwest of the discovery well Meyer No. 3.

Bell No. 1 was brought in November 3rd, 1921, with an initial flow of 4,000 barrels. This was slightly heavier oil and was produced from what was later termed the Bell zone, which was found to overlie the Meyer zone in which Meyer No. 3 was drilled.

A later development of this field was the discovery of an additional zone known as Foix, still shallower than the Bell. Both the Foix and Bell productive zones disappear into edge water before reaching the contour of the discovery well, Meyer No. 3.

Some of the best and most profitable wells in California have been in the Santa Fe Springs Field, the early development of which witnessed many hazards and some real catastrophes.

The Union Oil Company in drilling its Alexander No. 1 had set 12½ inch conductor string of casing at 2,000 feet, and it was the order of the State Mining Bureau at the time that all casing had to be tested regardless of its purpose. A water test was made but the water not shut off and drilling was resumed. Evidently the test had been made very close to a gas zone for when a depth of 2,060 feet was reached, before the well had been thoroughly mudded up, a terrific gas blow-out occurred. When the driller saw the mud starting to boil over around the rotary table, he called to the derrickman who was working about 75 feet above the ground to come down at once. The derrickman started and got within 30 or 35 feet of the ground when a full column of mud started through the derrick. He jumped to escape the force of the mud column and, fortunately, landed unhurt in a sump hole. The 900 feet of 6 inch

Crater of Alexander No. 1, viewed from the air

drill pipe that was in the hold at the time the blow-out started, went out through the derrick into the air and turned end for end, the bit striking the ground 700 feet from the well. The bit and drill collar was completely imbedded in the ground. Within three minutes after the blow-out started, the derrick was completely demolished and a huge crater formed. The well blew for twenty-nine days.

The next adventure with a gasser was Howard No. 1. It was drilled to 2,203 feet where 12½ inch casing was set. Anticipating a possible gasser, control equipment was placed on top of the well, but after bailing a short time, the well started to flow mud and sand which came with such force and velocity that the drillers were unable to close the gate valve. Within thirty minutes this rig was totally demolished and a great crater formed at the mouth of the well. This well caught fire, the gas having been ignited probably by friction of the sand or rocks on metal parts of the rig.

The next wild one for the Union Oil Company at Santa Fe Springs was Bell No. 2. It was thought that possibly a commercial gas zone existed in the field so 12½ inch casing was landed at 2,016 feet and all the necessary appliances for controlling a big gasser were installed. When the gas test was made it showed only a production of three or four million feet per day with a shut-in pressure of 350 pounds. Everyone concluded, therefore, that the other gas blow-outs had been from gas pockets or else the gas zone pressure had been depleted. The well was unharnessed and drilling continued until 2,665 feet had been reached when evidently another gas pocket was encountered and the well blew out. Like its sister well, Howard No. 1, it caught fire and finally formed a large crater and blew itself out.

There were no further gas or water tests tried on conductor strings in the Santa Fe Springs Field after these three unpleasant experiences, but Bell No. 17 blew out after the conductor string had been set at 1,500 feet and 10 inch water string had been set at 3,500 feet. Unlike the previous blow-outs, the rig was not destroyed nor any great crater formed, although there was a greater amount of mud, sand and shale discharged from this well and covered ten or fifteen acres of ground several feet deep.

The Union Oil Company was unfortunate in having the bulk of the blow-outs in Santa Fe Springs and it got some unpleasant advertising on this account, but the score was pretty well evened up when the Union went through most of the other fields with a big development program without blow-outs. This was particularly noticeable in Dominguez and Rosecrans Fields, both of which were discovered by Union Oil Company and in which the Union pioneered. In these fields, the Union carried on a major development program, bringing in some of the biggest wells without any loss through fire, blow-outs, or other causes.

So the oil driller is like the fellow who lives in a glass house, he never knows when his turn may come.

Sidelights on the History of Light

By HUGH A. MATIER

Being a chronicle of interesting facts in connection with the history and development of artificial illumination prior to the advent of electricity.

IN MY early days of theological instruction, the very first thing that was impressed on my mind was that light was the cause of all life and subsequent development. The statements in the first Mosaic book are brought out very strongly by geological research of our own times. The appendix to James D. Dana's textbook on Geology is very clear and comprehensive on this subject and is well worth reading, especially in these days of the so-called "war between science and theology."

To sum it up briefly, in the beginning Deity created heavens and earth and awful desolation and formlessness existed. Black darkness reigned, as Dana points out.

In an orderly progress of geological development the watery mists enveloping the earth were condensed so that the lights of the sun and moon shone for the first time on the congealed surface of the earth. These lights, along with the lightning's jagged flash and the soft beams of the stars and whatever phosphorescences existed either on land or sea, with the aurora, constituted natural illumination as contrasted with artificial illumination.

The cave homes of the early man and the dim beginnings of history show evidences of fire and, consequently, light; but as to how early in the stone age man was able to produce fire, there is no exact chronological knowledge. He may first have obtained fire from a burning tree, set afire by lightning or perhaps by frictions or the dropping of a spark on tindery material when two flint implements or weapons clashed. At any rate, it would seem that from early days the duty of guarding this precious flame from extinction was a special one and this duty would seem to exist down to Roman times when the virgins of Vesta guarded the flame sacredly in the temple, though, no doubt, fire for any purpose could be originated at a moment's notice.

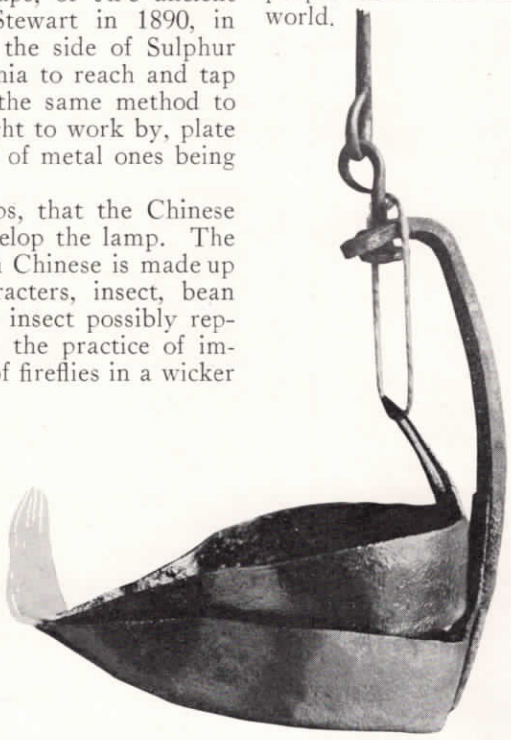
In the course of my own travels amongst the old temples of ancient Egypt and the study of their writings preserved in hieroglyph and papyri, I do not recall having ever seen a representation of lamp or candle, nor in Akkadian or Summarian pictographs nor in Babylonian carvings or Cuneiform is there any representation. Hittite pictograms have no symbols for lamps or candles. It may have been that the sun was an object of such intense worship that any artificial light to take the sun's place in darkness would have been looked on as a desecration of its Deity.

Illumination in dark places was however, very necessary at one period of Egypt's history, when four thousand years ago the priests of Egypt sought to protect their mummified royal dead from the vandal touch of the invaders from the south. Long, descending passages were cut at the foot of the abrupt, rocky escarpment of the Libyan Desert where the Nile has channeled in a similar though smaller way as has the Colorado River. Huge sepulture chambers were hollowed out at the end of these passages where the entire mummified royal family and many of the court attendants were disposed of. These subterranean chambers were decorated in the highly ornate fashion of that day. Today, these tombs can be visited and viewed by electric light and all the wonderful bas-relief of colored rock carvings seen. So delicate is the artistic handling of color and sculptural

nuance that it was for a time a puzzle how the sculptor painters could work in such gloom as exists a mile deep. Then a papyrus revealed that large, polished mirrors of metal were placed at the mouth of the tunnels and the sunlight reflected down the shaft, the light being bent around angles of the corridors by other mirrors.

Unconscious, perhaps, of the ancient precedent, Lyman Stewart in 1890, in drilling tunnels into the side of Sulphur Mountain in California to reach and tap the oil strata, used the same method to give the tunnelers light to work by, plate glass mirrors instead of metal ones being used.

It may be, perhaps, that the Chinese were the first to develop the lamp. The character for lamp in Chinese is made up of three minor characters, insect, bean and ascending. The insect possibly represents the firefly as the practice of imprisoning a number of fireflies in a wicker cage to give a radiance in a room at night is still carried on in China. Over the door of exit this cage of little insects is placed, just as we put a radium button on an electric light pull today. The character for bean represents the oil which is pressed from that plant which is used in a small floating saucer. In passing, I might say that A. E. Fowks told me that in his travels in Peru he came across a tribe of Indians who insist on illuminating their houses in this manner although they are only seventy-five miles from the Peruvian oil fields where kerosene is made. This is an extreme instance of conservatism in spite of every inducement towards progress. These Catacoas Indians live in the Piura Valley in Peru and are the weavers of what have been called Panama hats, until recently a costly article of luxury. These Panama hats are woven from a fibrous plant which is very brittle in the day time and, consequently, must be woven at night time when a moist fog sweeps in from the sea. Clay is obtained nearby and little lamps made from it, something in the shape of an ordinary saucer. In this little open dish, a cotton wick hangs over and is lit at night time. The resulting light just about shows how dark it is and Mr. Fowks says that there is possibly a higher percentage of blind people there than anywhere else in the world.



A Cruse or Fish-oil Lamp, used by Rathlin Islanders.

In the west of Ireland and north of Scotland, somewhat similar lamps are used; but as the climate is not suitable to the growing of plants with oleaginous seeds, (with the exception of flax and its oil is too heavy to burn,) they use the liver of the cod fish and, in rare instances, that from a stranded whale for their supply. With all these primitive peoples, however, it is a case of go to bed and get up with the sun, lights only being used for some extreme emergency, or as in the case of the Catacoas Indians, where their subsistence depends on it.

The candle is perhaps about as old as are these primitive lamps, the first materials used being tallow and beeswax and, in recent days, spermaceti wax and stearin, and since the days of petroleum development, paraffin wax. In Roman days, wax lights were used. In early Europe, the rush light illuminated the house of the noble, churches only being supplied with wax candles for devotional purposes. The hut of the villein was unlit.

Tallow candles began to be popular in early mediaeval days; the tallow from culinary processes was saved, melted and

strained and then lengths of cotton or peeled rushes were dipped into it until the desired thickness was obtained. In the guild days of mediaeval Europe, there was a guild of candle makers who sent the journeyman from house to house to make up the year's supply. A separate guild existed for the manufacture of wax candles. In England, the livery companies still existing are the wax chandlers and the tallow chandlers. Somewhere about the middle of the 18th century, wax from the sperm-whale was found to make a more satisfactory candle, more resistant to heat, (the old tallow candle being unsatisfactory in that respect,) and also giving a clearer light.

In the Vatican some of the old manuscript books show holes burnt in them when the student slept when poring over them and the candle melted and fell over on the vellum. The old Cruikshank illustrations to Dickens' works show candles used in every imaginable way. They also deal with the candlestick and the snuffers which were a pair of scissors to clip the long wick, a little box being on one blade of the scissors to catch the burnt portion which smelled very badly if allowed to hang over outside the flame. Blowing a candle out also caused a very bad smell due to the imperfect combustion of the decomposed fat, so a cone extinguisher was used. These instruments are still to be found in many out of the way parts of both Europe and America when traveling.

In the early part of the 19th century, Mr. Young of Edinburgh, discovered he could get burning oil from the rock shales near that town. A large amount of paraffin wax was recovered as a by-product and Young's paraffin candles are still marketed in large quantities in the smaller towns of Great Britain and Ireland as well as a certain export trade to Great Britain's colonies. Later on, in 1854, the wax residuum from the new petroleum industry of Pennsylvania, and later on Rangoon, was used.

In 1659, Thomas Shirley conducted experiments on a gas issuing from a well near Wigan in England and resulting, in his opinion, from the decomposition of coal seams in that vicinity. These experiments were described in a paper presented to the Royal Society at that time. In 1739, Dr. John Clayton, in a paper to that same Society, described the production of a gas with similar properties from coal heated in a closed vessel. The experiment of obtaining a long, clay, church warden's pipe, filling the bowl with powdered coal, tamping the mouth of the bowl with clay, putting the bowl in a hot fire and then lighting the resulting gas issuing from the stem was an experiment dear to youthful hearts.

In 1792, the practical value of coal gas as an illuminant was shown by a Scotchman, Mr. William Murdoch. Proposals soon after were made to light the House of Commons in London with this new illuminant. I am speaking from memory now but remember reading some of the old proceedings of the House of Commons. In connection with this bill, one of the members was highly indignant and said, "Mr. Speaker, does the author of this bill really have the insolence to suggest to our intelligence that he will convey this flame in a pipe from where it is made ten miles away?" Many people as well as the member of Parliament thought that the little flame traveled through the pipe. Another member said, "Do you mean to tell the House you can have a flame without a wick?" Objections were made on the ground that the gasometers would blow up the whole of London, that the air would be vitiated, plants and animals would die and London would be left waste.

The superiority of gas, however, soon made its use proceed rapidly. Gas was first of all burnt through a slot cut in a terminal to a pipe resulting in what was called the batswing burner, and later on two jets were used impinging on one another resulting in what is known as the fish-tail burner. The coronation of Queen Victoria was celebrated by an illumination of London with gas lamps with fish-tail burners. Next came the introduction of the Wellsbach or incandescent mantle made from a cotton mesh or stocking saturated in a solution of chemicals. This stocking, when placed in position above the gas flame, was set on fire with the result that only the chemicals remained.

The Bohemian Highway

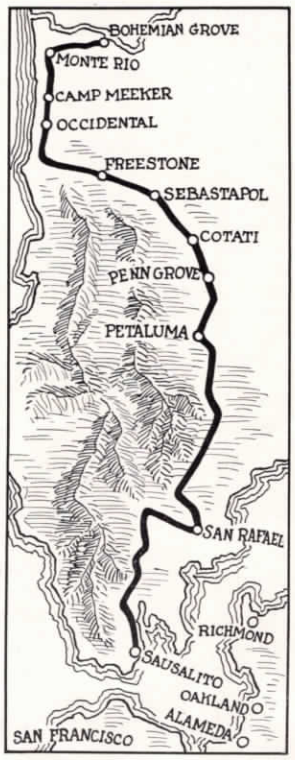
"SOME thoroughfare!"

This from Mr. Motorist. He turns to his wife on the seat beside him. "When I made the trip from San Francisco to Monte Rio last year, I couldn't enjoy this stretch. I had to keep my eye on the road ahead of me, and it wasn't from fascination either."

Mrs. Motorist leans far back on the cushions of the little roadster. It is spring, and the acres of blooming apple orchards freight the air. The amiable little lady in the lunch counter back in Sebastopol had told her about those apples. She called them—Oh! yes, Gravenstein apples. They were very popular with Luther Burbank, she said.

But the orchards are soon left behind.

They are now in the forest. The "forest primeval." Occidental, through which they had just passed, was a little town built in a clearing in forest of pine and fir and redwood. On all sides there were redwoods, large and small. The hillsides, which here became steeper with each succeeding mile, are crowned with towering redwoods and the less tall but equally stately pine and fir.



Every turn unfolds new vistas. It *is* wonderful that one can see and enjoy everything without having to share attention with a bumpy old road!

"Once I had visions of being a civil engineer instead of a tool salesman," continues Mr. Motorist, "and I learned just enough about road making at Berkeley to appreciate a good piece of work when I see it. Our old friend Francis Smith, down in Los Angeles, told me the asphalt on this particular job was furnished by Union Oil Company, and I'll say it worked some improvement. This new stretch from Occidental to Monte Rio is 'Bohemian Highway', opened last July—a shorter and more direct access to Bohemian Grove: folks from around San Francisco come every week end, and Monte Rio and the Russian River is growing more and more popular as a summer playground. I believe the round-trip can easily be made now in eight hours. We should and *will* come more often."

UNION OIL COMPANY GOLF TOURNAMENT

ORCUTT DISTRICT

The Orcutt District Championship was won by C. A. DeFrance, who defeated John Douglass in the finals by 5 and 4. Mr. DeFrance won all his matches in the Tournament by an easy margin and looks like a formidable contestant for President Cup honors.

SACRAMENTO DISTRICT

Tournament is getting towards its final stages in this District. According to reports received, those playing in the semi-finals are S. D. Herkner, J. R. Phillips, C. H. Mann, and O. D. Houx.

MARICOPA DISTRICT

During the month L. L. Greene, who Captains this District, called at the Los Angeles office and reported that golfing enthusiasts were few and far between in his locality, in fact, he was only able to find one other entrant. He and Bill Hopkins battled for the Championship, and Hopkins was the victor. Mr. Greene hopes that next year's entry for Maricopa will be a larger one.

HEAD OFFICE DISTRICT

Championship Frame

All first round matches have been completed in this frame and the survivors are as follows:

A. W. Anderson	W. L. Stewart
J. B. Arthur	E. G. Ragatz
J. D. Mackie	C. R. McCollum
E. Bouteiller	R. D. Matthews
A. W. Koerber	W. L. Stewart, Jr.
T. J. Collins	M. F. Robertson
D. F. Black	John McPeak
H. C. Ferry	W. L. Standard

The second round is well under way, but all matches have not been played. Those that have been completed, show the following result:

T. J. Collins defeated A. W. Koerber, 1 up.

H. C. Ferry defeated D. F. Black 1 up at 19th.

W. L. Stewart defeated E. G. Ragatz 5 and 4.

R. D. Matthews defeated C. R. McCollum 2 and 1.

John McPeak defeated M. F. Robertson 2 up.

W. L. Stewart, Jr., defeated W. L. Standard 2 up.

First Flight

Those who won the first round matches in this flight are as follows:

H. B. Noble	T. L. Fleming
F. R. Wallich	A. G. Dixon
W. S. Grant	W. Comstock
Spencer Britton	D. T. Forbes
Gordon McKelvie	J. M. Stirrett
L. G. Metcalf	R. O. Jones
M. R. Ruedy	

Only two of the second round games have been played as yet and the result of these matches were:

M. R. Ruedy defeated R. O. Jones 1 up at 19th.

C. S. McKeever defeated J. F. Simpson 3 and 1.

SANTA FE SPRINGS DIVISION

Picking a champion golfer to represent the Santa Fe Springs and Dominguez Districts in the play off for the President's Cup has become an argument of long standing among fans of this Royal and Ancient Sport.

Stanley Clark

The finals were played on January 5th, Stanley Clarke, District Accountant Santa Fe Springs defeating A. J. Brunner of Dominguez District in a 36-hole match that would be a credit to any tournament. Brunner was playing with a 1 stroke handicap which proved to be very useful to him, for at the 18th hole he had Clarke 1 down. At the 19th, however, Clarke squared the match with a birdie 3 and took the lead at the 21st, which he steadily increased to 6 up at the 31st. Both men were fighting hard through the match and were playing the brand of golf where a par only meant a halved hole and it took birdies to win.

UNION OIL COMPANY SOUTHERN DISTRICT GOLF LADDER

Beginning next month a golf ladder will be started in the Southern District. The same idea has been tried in many clubs and no doubt has done a great deal towards getting its members together, and also creating a spirit of friendly rivalry. This idea will also greatly help the golf committee in selecting teams for inter-company matches. The players occupying the top ten places on the ladder will constitute the Southern District Team.

Following are the rules that will govern playing of matches which will commence after February 1, 1927:

1. Total of Qualifying Rounds turned in for Head Office District Championship will determine position on ladder.

2. Ladder matches will start after February 1, 1927. All players should endeavor to improve or retain their place on the ladder by playing at least one challenge match each month.

3. Entries subsequent to original posted list will be placed in order at bottom of ladder.

4. All matches will be played from scratch.

5. Course chosen will be one agreeable to both players.

6. A player may challenge anyone who occupies a position higher on the ladder for his place

(with a limit of 5). A charge of ten cents a rung will be made and the loser of the match will pay this charge.

7. A challenged player losing his match will drop down *one* place giving winner his old position.

8. Games may be played in foursomes. No stymies.

9. No player is subject to challenge when his name is already posted for match.

10. A challenged player (unless for reason satisfactory to Golf Committee) must play his match within two weeks of receiving challenge or change places with challenger.

11. A Challenger losing his match must not challenge the same player again within thirty days.

12. Score cards must be signed and turned in to E. V. Manico, Room 903, who will be responsible for the keeping of the ladder and collection of fees.

13. Fees must be paid before ladder is changed. Money accumulated from this source will form a fund for purchase of prizes, etc., for future events.

14. U. S. G. A. Rules to apply. Stymie rules and local rules on back of score cards excepted.

Players in the Southern District who wish their names entered on this ladder should get in touch with E. V. Manico, Room 903, Union Oil Bldg., Los Angeles, before January 31, 1927, as entries after that date will be governed by rule No. 3 published above.

BASKETBALL

Los Angeles District

The first half of the Petroleum Athletic Association basketball league schedule closed December 16th with the Aristos and General Petroleum tied for first place, each team having won six games and lost one. As the schedule calls for the winner of the first half to play the winner of the second half a series of three games to decide the championship of the league, it was necessary to play an extra game to break the tie.

In the play-off, held January 4, the Aristos came through in the manner expected of them by winning what proved to be the most exciting game of the season by the score of 25 to 18, giving them top place in the league standing.

The second half of the schedule started January 6, the Union meeting and defeating the fast stepping Richfield five to the tune 19 to 17.

Portland District

For the fifth consecutive season, the Union Oil quintette, representing the Portland District, has won the championship of the Portland Industrial basketball league, defeating the strong Graybar Electric five in a hard fought tussle played December 18.

Johnny Faust and Dale Cherry have scored an average of more than 20 points a game and, with Oliver at center, formed possibly the strongest forward scoring combination ever turned out in the Industrial league. Freeman and Leo Faust are two steady, accurate shooting guards, completing the first string. Brown, Miller, Cook, Harding and Putney furnished a very creditable line of reserves.

The boys also claim highest hoop honors in the City of Portland, having offered to play all comers without receiving a single challenge.

Long Beach District

The Union Oil Company basketball team, representing the Los Angles Refinery and the sales stations in the Long Beach Commercial league is developing into a real contender for honors. In their last game, on January 3, the boys showed excellent form and romped home easy victors over the Mountain View Dairy team. The score in this game was 25 to 12. The players are: Anderson, Click, Maylan, Lang, Baker, Morton, Frisbee, Klein and Alexander.

BOWLING

In view of the widespread interest in bowling, as evidenced by the many leagues in operation throughout the company, a telegraphic play-off has been arranged by the Insurance & Personnel Depart-

ment for Tuesday evening, Feb. 8th at 8 P.M. and all districts and departments are urged to enter. Major F. R. Burnham, of the Burnham Exploration Co., has generously offered the handsome trophy pictured herewith, to be presented to the winning company team. The trophy will be known as the "Major F. R. Burnham Trophy" and will be competed for annually on the same basis as this first

(Continued on page 22)

NEWS OF THE MONTH

W. L. STEWART JR. NEW DIRECTOR

W. L. Stewart, Jr., was elected to the board of directors of the company at a special meeting of that body held December 28. He is the third generation of the Stewart family who has held an official position with the Union Oil Company. The company was formed by his grandfather, the late Lyman Stewart, whose son, W. L. Stewart, Sr., is the present head.

The election was made to fill the vacancy on the board occasioned by the death last June of C. W. Ralph, Director of Sales & Transportation. Mr. Stewart, Jr., is the youngest member of the directorate, and is a graduate of the Massachusetts Institute of Technology. His association with the company has been largely with the Manufacturing Department. He was elected to serve as secretary of the Manufacturing Committee in February of last year.

DECLARE DIVIDEND

At a meeting of the board of directors of the company held January 6th, a quarterly dividend of 50 cents per share and also an extra dividend of 50 cents per share was declared, payable February 10, 1927, to stockholders of record at Los Angeles and New York at the close of business January 15, 1927.

Following the meeting of the Union Oil directors, the directors of the Union Oil Associates met and declared a quarterly dividend of 50 cents per share and also an extra dividend of 47 cents per of record at the close of business January 15, 1927.

Three cents per share was deducted from the extra 50 cents dividend received from the Union Oil Company of California to pay the running expenses of the Union Oil Associates.

EMPLOYEES LIFE INSURANCE

Death claims to the amount of $116,500 were paid by the company to employee's dependents during the year 1926, according to G. G. Blue. The claims were paid under the provisions of the Employee's Benefit Fund and the Contributory Group Insurance plan.

NEW CRUDE PRODUCTION

New crude production amounting to approximately 1,910 barrels daily was secured by the company during the month of December. Colorado contributed 315 barrels daily from its Mitchell No. 2, 550 barrels a day from Yockey No. 1, a deepened well, 375 barrels from U. S. Wolfe No. 1 and 160 barrels from No. Poudre Stuchel No. 2. Elk Hills No. 17 and Jergins No. 4 in the Valley came in with a daily average of 80 barrels and 60 barrels respectively, Long Beach Community No. 14 came in with a daily yield of approximately 370 barrels.

UNION ETHYL MARKETING FACILITIES EXPANDED

With Union Ethyl gasoline on sale at company service stations and independent dealers in Canada and Arizona, this new super-motor fuel is now available to motorists throughout the entire marketing system of the company.

The new gasoline went on sale at Canadian points on the first of January, and in Arizona twelve days later.

SUCCESSOR TO J. M. DOUGLAS NAMED

Effective the first of the year, William G. Gallagher was appointed Chief Geologist Rocky Mountain District with headquarters at Fort Collins, Colorado.

Mr. Gallagher succeeds to the position formerly held by James M. Douglas who was recently appointed Venezuela Manager of Union National Petroleum Company.

NOVEMBER CRUDE PRODUCTION

The total production of crude oil in California for November amounted to 19,173,128 barrels, an average of 639,104 barrels per day. This is an increase of 27,296 barrels per day over October production.

Total stocks of crude and all products in Pacific Coast territory decreased during the month 82,473 barrels. The total stock decrease for 1926, up to November 30, was 12,412,435 barrels.

Ninety-one wells were completed during the month with an initial daily production of 62,588 barrels, compared with 73 wells completed during October with an initial production of 50,986 barrels.

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

DORSEY WELL ABANDONED

The company has abandoned its Dorsey No. 2 well deepened some months ago on the A. W. Dorsey ranch. It is considered on the edge of the structure. The well was originally drilled to the top sand, where collapsed casing stopped production.

SALES ORGANIZATION CHANGES

For the purpose of stimulating sales, a number of changes in the division sales organization, effective January 2, have been announced by J. M. Geary, Manager of Sales.

S. D. Herkner is now functioning as Division Manager on special assignments with headquarters in Los Angeles, having been succeeded by A. R. Atwood, formerly District Sales Manager at San Francisco, as Manager of Central Division.

The districts affected by the change, and their respective District Sales Managers under the new regime, are as follows:

San Francisco—W. L. Matlock
Los Angeles—M. W. McAfee
Fresno—H. F. Warner
Seattle—J. F. Federspiel
Oakland—Wade Hollingsworth
Stockton—D. R. Ensminger

R. A. Brand, formerly Special Agent in the Seattle district, succeeded Mr. Federspiel as Assistant District Sales Manager at Seattle.

THIS MONTH'S COVER

The good ship "1927" is hard upon us, loaded to the gunwales with prosperity and happiness. In the distance, "1926" is fast receding from view. A sturdy craft in her day—but having served her purpose, she gracefully disappears.

Cover painted especially for the Bulletin by T. H. McKay.

CAPTAIN HALVORSEN PROMOTED

Captain H. Halvorsen, master of the Warwick, has been appointed Port Captain with headquarters at Los Angeles Harbor.

Mr. Halvorsen's service with the company dates from 1914, when he shipped on one of the company's tankers as ordinary seaman. Ability, courage and faithfulness advanced him through the successive stages to his latest promotion, which became effective January 10.

MECHANICS OF SERVICE

A garage owner in The Dalles, Oregon, has exercised considerable ingenuity in the operation of a curb pump dispensing Union Oil products.

Realizing that successful salesmanship and prompt service are inseparable, the owner has installed a device which automatically notifies the attendant within the building the moment a customer drives up to the pump. A spring bar on the platform beside the station is depressed by the front wheel of the car, causing an electrical contact with an auto horn inside the garage. One toot is sufficient to bring the attendant on the run.

NEW ARIZONA AGENT

T. J. Long, pioneer business man of Globe, Arizona, has been appointed the company's agent in Gila county, and is now handling the distribution of Union products in that territory.

H. M. S. Renown, one of the first class ships of the British fleet, which will be fueled by the company at Balboa, the latter part of this month.
The big battle cruiser is conveying the Duke and Duchess of York on a tour to New Zealand and Australia. She is 795 feet long with a ninety-foot beam.

Views of the Carquinez Strait Highway Bridge now under construction across the westerly end of Carquinez Strait.

It is a four-span cantilever type bridge, 3350 feet in length, and will cost over six million dollars.

The gasoline, fuel oil and lubricating oil requirements of the Valley Bridge & Iron Company in their work on the foundations were furnished by our company.

SPORTS

(Continued from page 19)

competition. Company bowling medals will also be given the members of the winning team.

The following regulations will govern:

1. Pacific Coast Bowling Congress rules will prevail, all fouls being called and all other regulations strictly adhered to.

2. Only employees who have been employed for a period of three months prior to Febuary 1st, 1927 will be eligible to compete.

3. Where there is an organized Union Oil Company league the seven high men will constitute the team, five men playing, of course, and substitutions being allowed as required. Three games only will be rolled.

4. Where there is more than one league in operation in the same territory the leagues must not combine, but must enter separately.

5. Where there is no organized league a team may be recruited and enter the competition.

6. The Headquarters of the play-off will be in the Angeles Bowling Alleys, Olive St., Los Angeles, Cal., and several teams will compete there. Games will be rolled on February 8th commencing at 8 P.M. and a telegraphic message should be addressed to G. G. Blue, above address, after each game so that the results can be posted and the progress of each team noted. The Captain of each team will be advised by wire of the results immediately after the game.

7. All teams desiring to compete should do so by letter addressed to G. G. Blue, Manager of Insurance & Personnel, Los Angeles, as soon as possible and not later than February 1st. The names of the players should be listed giving occupation and date of employment, a Captain named, and the name and address of the Bowling Alley where the series will be rolled given.

Note: It is suggested that the teams entered arrange to play against another team, as the competition will tend to greatly increase scores.

Los Angeles District

With but four more nights of bowling for the 1926-1927 season, a glance at the League standings shows the Engineering Bears firmly entrenched in first place with a lead of four points.

On December 21 the Insurance and Personnel Division of the Company put up a large turkey as a prize for the bowler rolling the high series for the evening. The event was run at handicap to give everyone a fair chance. It was won by E. Mullenix of the L. A. Lubricating Team, scratch entrant, with a score of 607. He was closely pressed by Sleeth of the Manufacturing Department with 602 and Carey of the Engineering Lions with 600.

The League extends thanks to the Insurance and Personnel Division for the nice prize and hopes this will be an annual event.

Standings of the League on January 4th are as follows:

Santa Fe Springs Division

Interest and rivalry has reached a high pitch among the employees competing in the eight team league now bowling at Compton, every Tuesday evening.

A sharp shooting contest for a fifteen pound Christmas turkey, put up by the Personnel Department, was won by M. L. Bowser, drilling foreman at Dominguez. Bowser bowled 123 pins over his average in this contest and some of his friends are wondering what he could do if there were two turkeys at stake instead of one.

California Oil Statistics, November, 1926

PRODUCTION

(Figures of production and stocks are in barrels of 42 gals.)

DISTRICT	BARRELS PER MONTH	DAILY AVERAGE Nov. 1926	Oct. 1926	Nov. 1925
Kern River	369,548	12,316	12,391	12,458
McKittrick	154,841	5,161	5,314	5,718
Midway-Sunset	2,734,324	91,144	93,360	96,208
Elk Hills	1,037,065	34,569	34,216	30,104
Lost Hills-Belridge	145,062	4,835	4,864	4,559
Coalinga	593,002	19,767	19,721	19,037
Wheeler Ridge	33,084	1,103	1,076	905
Watsonville	1,725	58	58	58
Santa Maria	148,571	4,952	5,000	5,637
Summerland	3,852	128	130	129
Ventura Avenue	1,700,122	56,671	50,474	30,728
Ventura-Newhall	185,530	6,184	6,321	6,095
Los Angeles-Salt Lake	54,768	1,826	1,902	1,992
Whittier	55,033	1,834	2,025	2,058
Fullerton	745,452	24,848	22,043	13,314
Coyote	465,385	15,513	16,216	17,447
Santa Fe Springs	1,355,288	45,176	45,981	51,707
Montebello	524,768	17,492	17,428	18,636
Richfield	537,511	17,917	17,410	14,014
Huntington Beach	2,259,989	75,333	54,233	45,464
Long Beach	2,865,281	95,509	95,582	107,621
Torrance	797,295	26,577	26,579	32,231
Dominguez	607,817	20,261	22,013	26,984
Rosecrans	443,987	14,800	14,300	22,832
Inglewood	1,198,421	39,947	41,255	70,621
Newport	1,825	61	173	70
Seal Beach	153,582	5,119	1,741	.....
TOTAL	19,173,128	639,104	611,808	636,530
October	18,966,058	611,808	.....	.....
Increase	207,070	27,296	.....	.....

STOCKS

	Nov. 30, 1926	Oct. 31, 1926	Nov. Stock Decreases	Nov. 30, 1925
Heavy Crude, heavier than 20° A.P.I., including all grades of fuel	88,606,574	88,588,410	*18,164	85,614,278
Refinable Crude, 20° A.P.I., and lighter	30,224,135	30,323,321	99,186	43,930,517
Gasoline	11,209,705	10,614,073	*595,632	10,015,112
Naphtha Distillates	3,841,424	4,120,222	278,798	6,373,852
All Other Stocks	11,022,036	11,340,321	318,285	9,764,934
TOTAL ALL STOCKS	144,903,874	144,986,347	82,473	155,698,693

*Increase.

DEVELOPMENT

DISTRICT	New Rigs Up	Active Drilling	Completed	Daily Initial Output	Active Producing	Abandoned Wells Drillers	Producers
Kern River	7	14	6	785	1,338	3	.....
McKittrick	2	8	2	50	308	.....	.....
Midway-Sunset	13	34	14	1,182	2,987	4	.....
Elk Hills	.....	.....	.....	.....	250	3	.....
Lost Hills-Belridge	1	1	2	32	312	2	.....
Coalinga	.....	7	.....	.....	960	.....	.....
Wheeler Ridge	1	1	.....	.....	27	.....	.....
Watsonville	.....	.....	.....	.....	6	.....	.....
Santa Maria	2	5	.....	.....	224	.....	.....
Summerland	.....	.....	.....	.....	135	.....	.....
Ventura Avenue	3	29	4	11,428	75	.....	.....
Ventura-Newhall	7	40	2	275	520	2	.....
Los Angeles-Salt Lake	.....	.....	.....	.....	376	.....	.....
Whittier	1	3	1	20	190	1	.....
Fullerton	3	9	4	5,069	443	.....	.....
Coyote	1	2	.....	.....	213	.....	.....
Santa Fe Springs	.....	4	.....	.....	334	.....	.....
Montebello	.....	4	4	1,265	187	.....	.....
Richfield	4	26	2	1,525	197	1	.....
Huntington Beach	36	99	36	31,803	424	.....	1
Long Beach	5	18	4	1,696	726	2	13
Torrance	5	3	3	739	654	.....	2
Dominguez	1	2	.....	.....	75	.....	.....
Rosecrans	4	2	2	970	138	.....	2
Inglewood	3	3	3	396	206	1	.....
Newport	.....	3	.....	.....	8	1	.....
Seal Beach	6	6	2	5,353	3	.....	.....
Miscellaneous Drilling	14	129	.....	.....	.....	14	.....
November	119	452	91	62.588	11,316	34	18
October	108	442	73	50,986	11,296	26	18
Increase	11	10	18	11,602	20	8	.....
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	
Average for year 1922	115	605	67	43,700	9,410	17	
Average for year 1921	90	536	57	15,631	9,425	14	

Waiter—"How will you have your eggs cooked?"
Customer—"Make any difference in the price?"
Waiter—"No."
Customer—"Then cook 'em with a nice slice of ham."

* * *

"There are no back-seat drivers in my family."
"You're lucky."
"Yep. She rides on the front seat."

* * *

"My accusers are right. I am a liar."
"I don't believe you."

* * *

"Bill made a fortune out of his oil well."
"I didn't know he struck oil."
"He didn't, but he pulled up the well and sold it for post holes."

* * *

"Stop sniffling, little boy. Can't you do something with your nose?" the austere old lady asked on the crowded street car.
"Yes'm," returned the lad politely, "I can keep it out of other folks' business."

* * *

A Scotchman in a Penny Arcade came across a punching-bag machine with a notice on it to the effect that if one hit the bag hard enough the penny would be returned.
Friends found him two hours later, lying under the machine, unconscious, with both arms broken.

* * *

"I heard you refuse a job of president of the company."
"Yeh, there was no chance for advancement."

"Wot did the doctor say to do fer yer cold, mate?"
"Drink water, 'e sez. But hi tried a whole arf glaws o' the blinking stuff three weeks ago come Friday, and I aint cured yet."

* * *

Bride: "I want a pound of mince-meat—please take it from a nice young mince."

* * *

"The baby swallowed a bottle of ink!"
"Incredible!"
"No, indelible!"

* * *

"Gawsh," said the sparrow as a fourteen inch shell just missed it, "gee, they must be hard up for meat."

* * *

An Irishman applied for a job at a power plant.
"What can you do?" asked the chief.
"Almost anything, sor," said the Irishman.
"Well," said the chief, a bit of a joker, "you seem to be all right, could you wheel out a barrow of smoke?"
"Shure, fill it up for me."

* * *

Tourist: "Brother! We've climbed to the top of this mountain to see the view and we've forgotten the glasses."
Scottish Guide: "Och! never mind, there's nobody aboot. We can just drink oot o' the bottle."

* * *

Ikey: "Rosenblatt had a terrible fire last week."
Moses: "Yes? Vell, he's a nice feller—he deserves it."

Rain

PATIENCE L. PASCHALL

Rain on the old shake roof! Beautiful cadence!
Rhythms recurring—allegro, crescendo,
Soft pianissimo fingered by fairies.
Oregon rain from the boundless Pacific
Sucked up eternally out of the ocean,
Drawing the sting from the frosts of October,
Sheathing the dagger of terrible winter.
'Tis you who tenderly cherish the forest,
Loving the lichens and painting the fungi,
Swelling the mosses, baptizing the fern fronds,
Steeping the leaf-mould's ineffable odors,
Pelting the evergreens, drooping and dripping,
Dimpling the waters, grey Puget Sound waters,
Iron-grey waters and widening rivers,
Bidding the tiny brooks, swelled with importance,
Carry the message to myriad salmon,
Urging, impelling them—"Come up the rivers,
Accomplish your life-work and fear not to perish!"
Change is not death. Lo! the tiniest raindrop
Yields herself up to the unending cycle,
Gliding from petal to streamlet and river
Through ocean and vapor, immortal forever!

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