The TEXACO STAR

NOVEMBER 1913
VOL. 1 NO. 1

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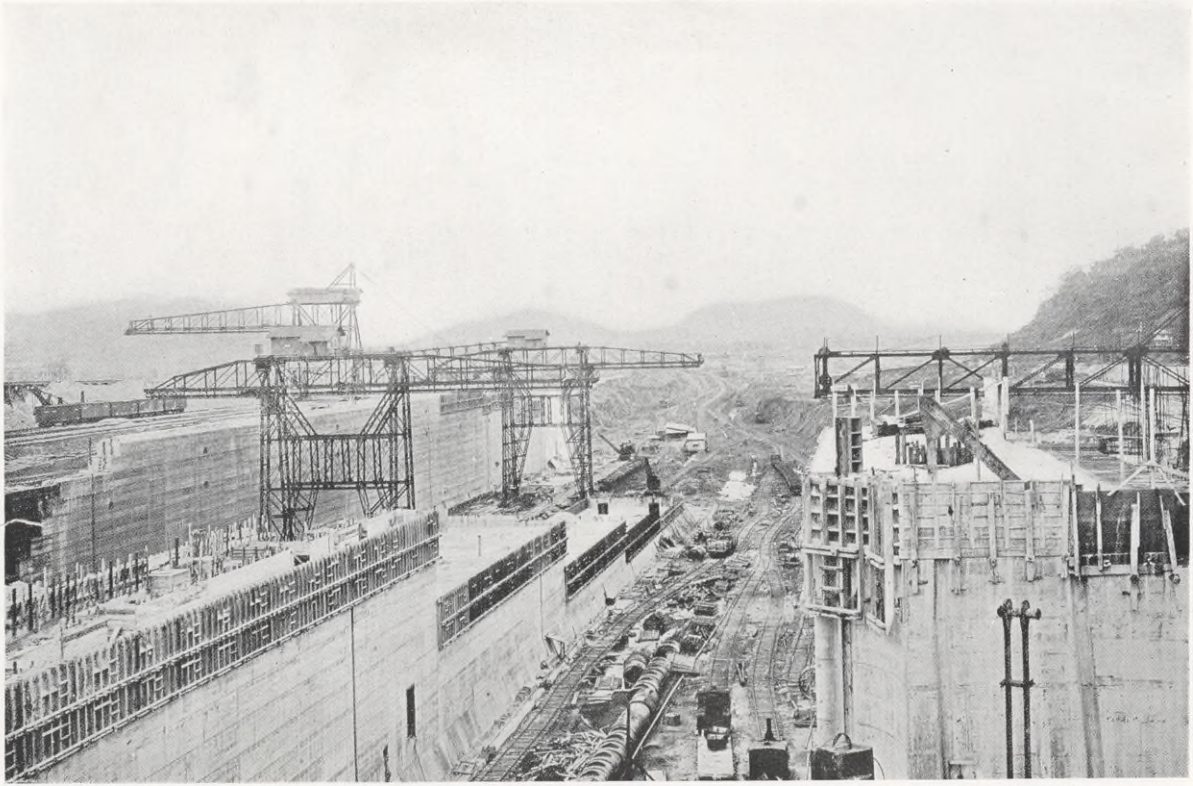
SUCCESS comes only to those who lead the life of endeavor. The simple acceptance of this fundamental fact—this acknowledgment that the law of work is the fundamental law of our being, will help us to start aright in facing not a few of the problems that confront us from without and within. It should teach us the prime need of remembering that, after all has been said and done, the chief factor in any man's success or failure must be his own character—that is, the sum of his common sense, his courage, his virile energy and capacity. Nothing can take the place of this individual factor.

Besides each one of us working individually, all of us have got to work together. We cannot possibly do our best work, unless all of us know how to act in combination as well as how to act each individually for himself.

—*Theodore Roosevelt.*



Texaco Lubricants on the Panama Work

TEXACO STAR

VOL. I NOVEMBER, 1913 NO. 1

PRINTED FOR DISTRIBUTION TO EMPLOYEES OF

THE TEXAS COMPANY

"ALL FOR EACH—EACH FOR ALL"

ADDRESS: TEXACO STAR, 1101 CARTER BUILDING, HOUSTON, TEXAS

THE TEXACO STAR is founded in the hope that it may become a medium of useful service to The Texas Company and to the legions of individuals who are loyally working in its complex organization. The scope of this monthly house journal, or company bulletin, will be as wide as the varied interests of the Company. The affairs of The Texas Company extend over the face of the earth and comprise many inter-related departments, each dependent upon all and all upon each for efficiency. Probably men working in one department do not adequately comprehend and sympathize with the work and aims of other departments. Perhaps some do not thoroughly understand the various activities of their own department. Information about the work and functions of the constituent parts of the organization must tend to infuse an intelligent interest, and consequent aspirations and hopes for advancement as a reward of meritorious diligence. In short, the psychological effect should be an enlivened *esprit de corps*. The spirit of the hive, a desire to co-operate, to "play the game," makes very strongly for the satisfaction and happiness and prosperity of the individual, and increases the efficiency of all co-operative action.

★ ★

Successive issues will feature the respective departmental activities of The Texas Company. These leading articles will, of course, vary in extent. Sometimes one article will suffice to describe the work and function of a department; sometimes more than one will be required. When the series is completed, a file, or bound volume, of the TEXACO STAR should afford a fairly comprehensive view of the Company's integral parts. The primary intention of each of the proposed articles will be to inform and interest the members of other departments, the constant aim being to give to every employe of the Company a view of the activities of all its departments.

This initial issue begins the series of descriptive articles with an account of the *products* of the Refining Department. The second issue will also be a Refining Department number. Its leading article will describe the refining *Works*, including a summary description of Terminals since the latter are placed within the jurisdiction of the Refining Department. It is highly desirable that the entire force in every department should have definite knowledge and appreciation of the nature and qualities of The Texas Company products. It is for the production and sale of our products that all departments of the organization exist.

★ ★

The design of each of the other Sections appearing in this first issue is sufficiently indicated by its caption and contents. We hope, however, to improve as facilities and experience grow.

Permanent sections, not represented in this issue, may be added. If any demand for such service should be manifested, this office will studiously endeavor to supply information to all officers and employes in answer to questions in the line of their employment or allotted duty. Facilities, in the way of libraries, for such service, will be extended in proportion to the demand. We do not, nor ever will, "know it all"; but no pains would be spared to supply reliable information in response to every legitimate request. Individual inquiries might often be of general interest and otherwise appropriate for publication, and discussions of general advantage would probably arise, if a demand for a *Correspondence Forum* appears.

Probably the executive department will from time to time make this journal a vehicle for communicating to the company at large executive orders of general interest, statistical facts, bulletins and other data helpful to the entire organization.

★ ★

The first two or three Numbers of the TEXACO STAR will be distributed to more than four thousand regular monthly employes through department, division, and district offices. Enclosed in the second or third and one following issue, will be a card asking for home address, which each employe who desires to receive future issues must sign and return by mail. Subsequent issues will be mailed to the home addresses of all who return cards. Thereafter, applications to receive the TEXACO STAR will be accepted at any time, and the names of applicants will be added to the permanent mailing list. A name dropped from the pay roll will be dropped from the mailing list.

★ ★

There are two kinds of wages—money wages and real wages. For the long run, and viewed at large, there is only one way by which real wages may be increased. The productivity of the individual worker must increase to increase real wages in any broad and permanent sense. Real wages are measured by the quantity of goods for which the workers exchange their labor. Many men thoughtlessly argue and protest violently that the profit of increased individual efficiency would be taken by Capital. That could not possibly be true except in some narrow instance where the market for the product is in foreign territory. For instance the real wages of savages collecting rubber in the forest might not be increased, though their productivity increased. But such a condition has nothing to do with the question when the consumers of the products of labor are the mass of the people in the same country. Capital cannot get profit from increased production unless consumption increases. In such a country as ours consumption can increase only as the power of the mass of the people to buy goods—that is their real wages—increases. With us the workers are themselves the chief consumers. As consumers capitalists make a very small factor. The mass of the people mutually consume the products of their own labor. They can consume more only through producing more. If they consume more, their real wages, in that very fact, rise. On the other hand money wages might rise while real wages were falling. The great factor in true increase of wages is efficiency in production—including the elimination of waste in both manufacture and marketing. The profit of the capitalist, though sometimes large for the individual, is negligible when divided by the whole number of producers. The entire profits of capital, if divided equally among all who labor, would raise money wages only by a very little; and such a distribution would, doubtless, cause real wages to fall, because the best tools of production would not be provided. In short, if the average productivity per man increases, real wages necessarily increase.

★ ★

All works of quality must bear a price in proportion to the skill, time, expense, and the risk attending their invention and manufacture.—*John Ruskin.*

★ ★

Genuine success can never be won by shrewdness alone. There is true philosophy in the saying: "Any game that can be played by a lone hand is a sheer gamble."

★ ★

The best machine will be ruined unless it is constantly well lubricated. What oil is for the machine, courtesy is in the transaction of business. It is not only the salesman who needs to use the great lubricant of human intercourse. The temptation is strong to answer a rude or unreasonable letter by caustic arguments that will leave the "kicker" no ground, either in reason or self-respect, to stand on. But there is no profit in such a victory. Whichever way the business concern comes out of the argument, it gets the worst of it. The individual whipped in such a contest of acrimonious its, never forgives or forgets.

★ ★

Most men, perhaps athletic in youth, grow stale and deteriorate in physical tone after thirty; few women take sufficient active outdoor exercise. The best time to establish a healthful regimen is while the body is free from disease. The misguided victim of neglected hygiene can often do little more than

cover his deformities with a disguise of neatness, hoping that beneath the mask of starched linen or skilfully knotted ribbon the effects of personal neglect may pass unobserved. Even by good practices tardily but wisely adopted there is little hope of such a delinquent becoming a sturdy veteran whose rugged but life-worn figure inspires younger combatants on the field of life.

People are apt to think of their bodily frailties as misfortunes that come irrespective of acts, vices, or hurtful ways of living unless, indeed, the acts are flagrantly wrong, the vices glaring, or the way of living utterly riotous. At the bottom of spoiled health are in many cases slight divergences from rational living, neglect, and indulgences that can scarcely be characterized as blameful. Blamable or not, health is none the less undermined by their continuance and the barriers are lowered for disease to enter.

In every campaign the question arises, How much injury will this victory warrant? In the material operations of every man's life similar queries present themselves. How much health is this money worth? Is the plain question; or is this dollar or are these hundreds of thousands or millions of dollars worth a weak lung, a leaky heart, a damaged kidney, or a reduced resistance to infection? The answer will depend on a sound and broad sense of values.—*J. M. Eager, Surgeon U. S. Public Health Service.*

★ ★

Few of us drink enough water. Convenient access to good water and drinking facilities ought to be provided in all offices and shops. Secure that condition. Then make it a point to drink a glass of water every hour. The effect will surprise you.

★ ★

It is the way in which hours of freedom are spent that determines, as much as war or labor, the moral worth of a nation. It raises or lowers, it replenishes or exhausts. At present we find, in these great cities of ours, that three days' idleness will fill the hospitals with victims whom weeks or months of toil had left unscathed.—*Maeterlinck.*

★ ★

The whole world of industry will have to learn the great lesson, that of the three great factors, material, machine, and man, the man is not the least, but the most important. —*Hugo Münsterburg.*

★ ★

Mr. S. J. Payne, an Assistant Secretary in the Executive Department sends a highly appreciated letter saying: "In case you are going to get out an issue of the new journal soon, I thought the attached clippings from the London *Daily Mail* might be of interest. I see they are claiming that the longest pipe line is in Russia and is 550 miles long, but I believe we can beat that in this country."

The interesting clippings from the London *Daily Mail* follow:

It is stated that estimates are being asked for laying what, it is believed, will be the first oil pipe-line in England—between Grimsby and Selby, in Yorkshire, a distance of forty-four miles as the crow flies.

The scheme is thought to be connected with the proposed naval base on the Humber and the new era of oil-driven warships, Selby, it is reported, being chosen as the depot for oil fuel owing to its security from attack.

The transport of oil by pipe-line had its origin in the petroleum fields of Pennsylvania, where the first pipe-line was laid in 1865. The longest pipe-line is believed to be one of 550 miles, connecting Baku, on the Caspian Sea, with Batoum, on the Black Sea.

The discovery has been made, says the *Dundee Advertiser*, that the island of Skye contains extensive deposits of oil shale covering an area which may prove equal to that of the Lothians.

It will be recalled that Mr. Churchill stated recently in the House of Commons that the nation had a capital asset in the Scottish oilfields for the day when the Navy would require oil fuel.

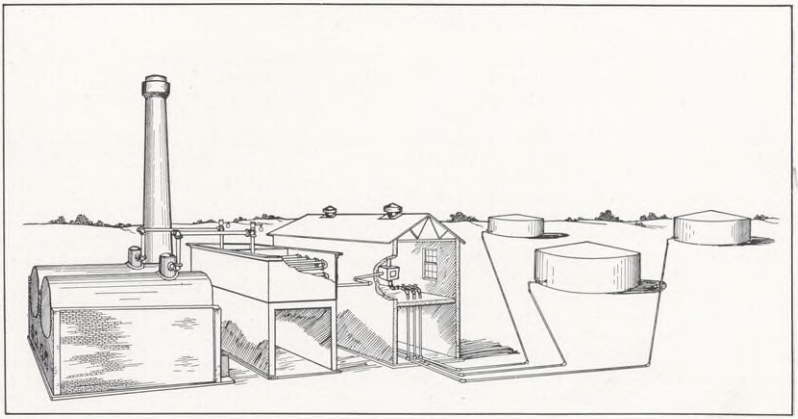
The present output of crude oil in Scotland is estimated at from 80,000,000 to 100,000,000 gallons a year.

★ ★

Winston Churchill, First Lord of the British Admiralty, in announcing the programs for 1914–15 stated that "most of the new warships will be built for oil consumption," and that "the Admiralty will set up an oil business of its own."

★ ★

The Editor cannot answer Mr. Payne's question by giving accurate mileage for our longest pipe line, but he is undoubtedly right in his opinion that we have continuous lines much exceeding 550 miles. The lines of the Standard from Appalachian, Lima-Indiana, Illinois, and Mid-Continent fields constitute one vast system. Through this system oil is actually piped the full distance from Oklahoma to the Atlantic Ocean. The lines are so connected that any refinery of the Standard from Kansas to the seaboard can be supplied as desired with the crude oil from any of the great fields.



Crude Oil Stills

PETROLEUM PRODUCTS

R. C. HOLMES

Vice-President and Manager of Refining Department

THE products of petroleum are usually divided into the following general classification:

Gasoline and Naphthas
Illuminating Oils
Gas Oils
Lubricating Oils
Paraffine Waxes
Asphalt

Fuel Oil may be added, but this is not essentially a separate classification, as with the exception of some special Fuel Oils, the greater quantity consumed is of the lighter crudes with the gasoline and illuminating fractions removed, or some of the heavier crudes in their natural state.

Each of these divisions or classifications in turn is subdivided into many different grades or units to meet the numerous trade requirements.

Refining is therefore, a process of fractionating or separating crude oils into as few or as many divisions as desired and available from the crude at hand. The methods employed differ in many important respects, due partially to the different character of the crudes, but to a larger extent to the grade or nature of the finished products to be manufactured.

The principal operation of refining is the distillation of the crude and further re-distillations or fractionations of the many divisions.

On the equipment for vaporizing and condensing, and the temperatures applied, depend to a large extent the economy of operation and the quality of the products. The refiner must determine which of the products are to be given preference in the distillations, the greater number of petroleum products, with the general exception of cylinder oils, black oils, and asphalts being products of distillation, or distilled portions of the crudes. The heat employed is fire, fire and steam, or steam alone.

In many refineries, where only gasoline, illuminating oils, and fuel oils are produced, operations are comparatively simple. A still, or a battery of stills, operating separately, or connectedly if by continuous distillation, is charged with the crude oil and gradually heated with fire. The distillates are produced in the following order as the temperature of the charge is increased:

Naphtha Distillates
Illuminating Oil Distillates
Gas Oil

The residue or portion remaining in the still in this instance would be termed Fuel Oil. If running also for paraffine and lubricating oils, the refiner may transfer the tar or fuel oil to other stills termed "tar stills" or "par-

affine stills," although a later practice is to equip stills to run the crude oil down to coke. In either event additional distillates

Gas Oil
Intermediate Paraffine Distillate
Heavy Paraffine Distillate

will be secured. These paraffine distillates contain the lubricating oils and wax, and the residue will be petroleum coke.

If running for cylinder stock, which will of necessity be from paraffine base crude, fire and steam are both employed, it being desirable to keep the temperature as low as possible and avoid cracking, or destructive distillation. Fairly rapid distillation will be maintained until the residue has assumed the required tests, and the steam spray will be well distributed over the bottom of the still.

As a result of giving cylinder oils preference, the yield and quality of the illuminating oil distillate may to some extent be impaired; likewise the paraffine distillate. To secure the best results, in further refining, redistillation of part of the illuminating oil distillate and possibly all of the paraffine distillate may be found of advantage before proceeding with the regular order of refining.

In the distillation of asphalt base crudes, practically the same methods are employed. If running for gasoline, illuminating oil, and fuel oil, in all probability fire alone will be used and the products resulting will be

Naphtha Distillate
Illuminating Oil Distillate
Fuel Oil

If running for asphalt, much the same conditions will apply as when running paraffine base crudes for cylinder stock, and both fire and steam will be used. The resulting products in this instance will be

Naphtha Distillate
Illuminating Oil Distillate
Gas Oil
Lubricating Oil Distillate

The residue may be run to finished asphalt or to an asphalt flux, and transferred to other equipment for final treatment.

Some crudes and distillates containing difficult sulphur compounds require equipment and treatment out of the ordinary; but in the usual order of refining, after the crude distillations enumerated above, the naphtha distillates and illuminating oil distillates are steam-stilled. First, however, the naphtha distillates are usually given a chemical treatment in equipment termed "agitators" for the purpose of desulphurizing, deodorizing, and otherwise improving the quality.

The steam-stills are similar to crude stills, except that steam alone is employed as a distilling agent, it being more effective in separating thoroughly the gasolines from the illuminating oils and otherwise giving better results. The temperature of a steam-still will probably never exceed 215° Fahr., which is sufficient to vaporize the naphtha products without vaporizing the illuminating oil fractions, thereby making the thorough separation which is necessary between the gasolines and illuminating oils. Also, there is less discoloration than with fire heat.

Thus, in the process of distillation, the portion distilled from the illuminating oil distillate will go into naphtha distillate, and the distillate coming from the naphtha distillation will be divided into the various grades of gasolines, varnish naphthas, etc., and from some of these distillates, Texaco Spirits and Texene.

The paraffine distillates are chilled with refrigerating machinery which solidifies the wax, and in this condition they are pumped through filter presses to separate the crude wax from the oil. This process has two objects;

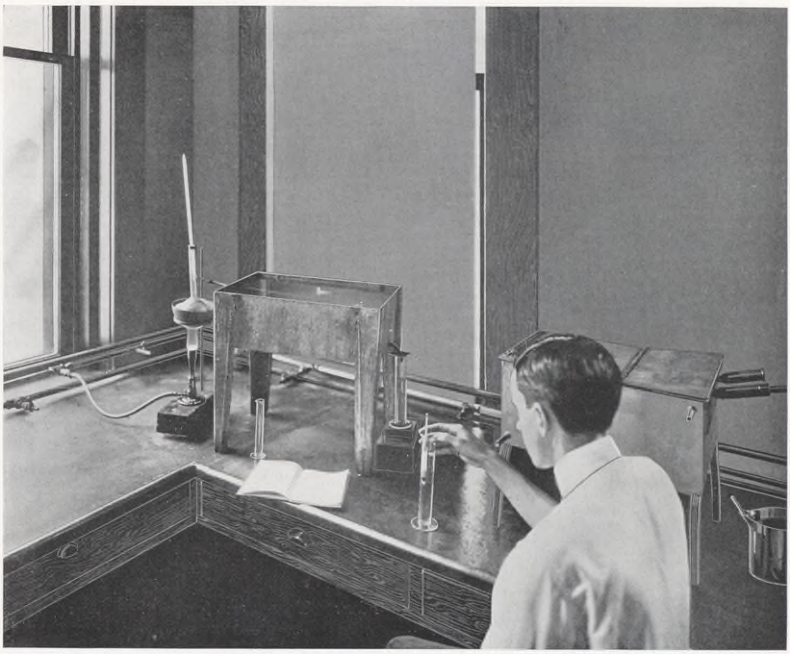
First: To recover the wax, which by separate refining equipment is worked up into different grades of refined paraffine wax;

Second: That without the removal of the wax, the distillates would be unsuited for the manufacture of lubricating oils on account of their tendency to chill or congeal at ordinary working temperatures.

The Pressed Distillate, or paraffine distillate with the wax removed, is then fractionated by steam and fire distillation, condenser separations and reductions, into the endless variety of lubricating oil stocks, which by chemical treatment, filtering, compounding, etc., become finished products.

These separations also yield some additional gas oil, which goes into the general stock from other operations of the refinery.

Lubricating distillates from most of the asphalt base crudes are handled in a similar manner, except that (containing no paraffine and being naturally of a low cold test) they do not require pressing and avoid the straight fire, or destructive distillation, which is to a large extent harmful to the quality and yield of lubricating oils.



Fractional Distillation Test

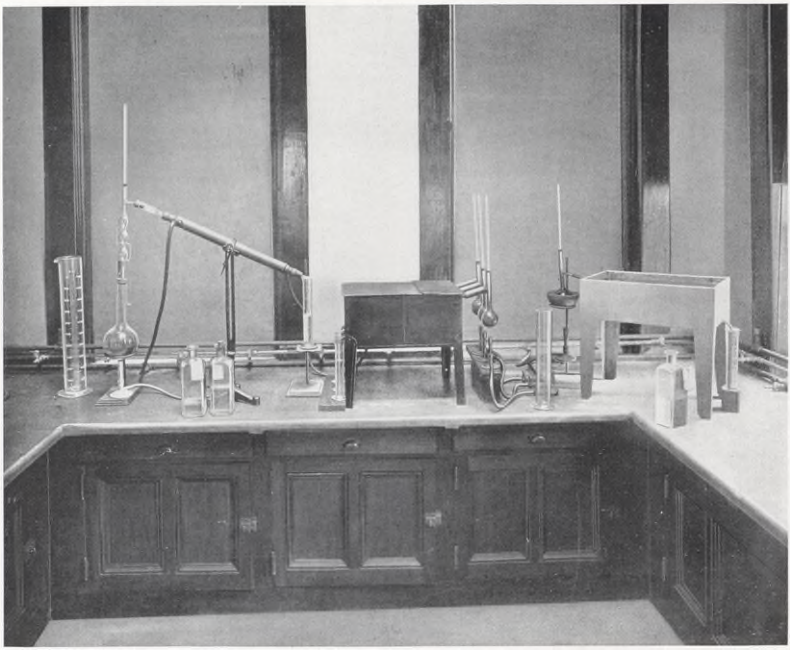
In all of these and the many other operations of producing petroleum products, there must be some definite aim or purpose as the end of each of these many divisions or separations. This is usually in the form of a specification or an outline of the chemical and physical tests which each product must meet, and is usually intended to insure essential qualities or fitness for a particular purpose. Unfortunately many specifications are based on products from some one particular crude, often making it impracticable to bring products from other crudes to conform and yet maintain the desired elements of quality.

GASOLINE Naphtha was originally the term applied to Shale Oils and Petroleum indiscriminately, but now is used in a general and vague sense and has no specific application scientifically to any particular liquid. Commercially it is understood to apply to volatile distillates of crude mineral oils and coal tar, and sometimes to similar products from distillation of India rubber, bones, peat, and wood. In the petroleum industry the term is generally applied to the first cut or unrefined division of petroleum under distillation, lighter than illuminating oils; also to the heavier portions of the same distillate when refined.

At the present time Gasoline is the general term applied to the product used mainly as fuel for automobiles and motor boats, and for gasoline stoves, dry-cleaning, etc. In England and English colonies it is known as "Petrol," and on the European continent as "Benzine," or "Essence."

During the earlier development of refining in this country, that portion of the naphtha cut used for air gas and for carbonization with water gas to give illuminating power, was termed Gasoline and ranged in gravity between 80° and 90° Beaume.

Other divisions of the naphtha cut were "Rigoline" of about 90° Beaume, used for surgical purposes and as a refrigerant, and "Cymogene," a product still lighter, produced in very small quantities.



Typical Intermittent Steam Stills

The heavier divisions, termed "Naphtha," ranged in gravity from 76° to about 62° Beaume. The lighter ones were used largely for street lamps, etc., and the heavier ones for paint and varnish making and for oil-cloth, etc. In all of these, as now, the range or limit of distillation, or degree of volatility, was in reality the determining factor, whether determined by actual use or by laboratory test, and gravities varied to some extent with different manufacturers, although all used crude from the Pennsylvania fields (the only source of supply until about 1885). With the introduction of the gasoline stove, the divisions were more generally known as "76 Gasoline," "Stove Gasoline," and "Varnish Naphtha." The stove gasoline ranged from 66° to 70° Beaume.

The uses for gasoline and naphthas are such that when used as a liquid satisfactorily they are required eventually to entirely evaporate, leaving no oil or residue. Equipment for consumption in stoves, and in automobiles and other internal combustion engines, are designed to consume the product as a gas or in a vaporous form, and unless readily and entirely vaporized the results are not satisfactory.

Aside from the requirement that gasolines and naphthas shall be free from objectionable odors, sulphur, carbon-forming and other foreign matter, distillation is the all-important test and gravity is of little consequence except as it may indicate a range of distillation and other tests of products of any one particular crude. The lower the gravity the greater the amount of power or heat units, providing the distillation is the same.

In January of this year the General Electric Company issued a small pamphlet treating the subject of fuel for their gas-electric motor cars, indicating a careful study of the subject from a consumer's standpoint. From it I quote as follows:

"As the first naphtha or gasoline used in internal combustion engines was obtained from Eastern paraffine base petroleum, the general impression gained was that 0.707 to

Testing Color, Gravity and Viscosity of Lubricating Oil

0.679 specific gravity naphtha was necessary for satisfactory operation. This impression is erroneous and unjust to the Western and asphalt-base petroleums which are now furnishing by far the greater portion of the world's supply of naphtha.

"The annual consumption of naphtha and other petroleum products is constantly increasing and new fields of supply are being discovered. Therefore, it is imperative that a reliable means for comparing the various petroleums be brought to the attention of the general public, and strenuous steps taken to point out that *gravity* by Beaume scale or otherwise *tells nothing* in regard to the relative suitability of the naphthas.

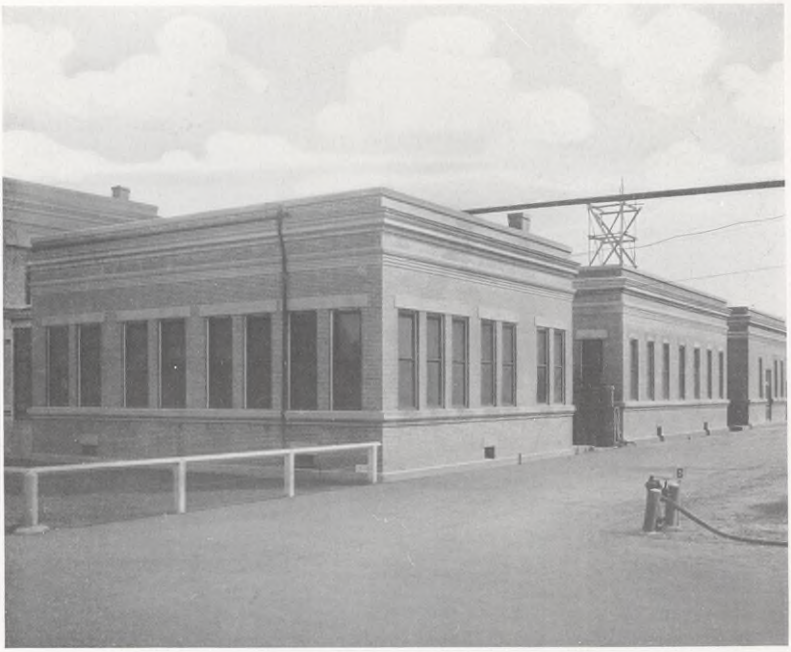
"The following extract from a paper of the American Society for Testing Materials illustrates this fact:

'As a striking example of the irrelevancy of specific gravity as a criterion for the actual use of gasoline products, there is given below a comparative distillation test between two naphthas of different origin both of which will, of course, give equally good results in any motor, but one of which would be rejected by most of the present specifications on account of its low specific gravity.'

THE COMPARATIVE DISTILLATION TEST

Test No.	1220	1226
Specific Gravity	0.6865	0.7598
Beaume	74.7	54.8
	Distillation	
Boiling Point	120 Fahr.	140 Fahr.
10% over at	140 "	170 "
20% " "	148 "	179 "
30% " "	156 "	186 "
40% " "	166 "	192 "
50% " "	176 "	198 "
60% " "	186 "	204 "
70% " "	196 "	210 "
80% " "	210 "	220 "
90% " "	240 "	234 "
95% " "	270 " (end)	254 "
98% " "		270 "

'A striking example which may be cited, is that of the U. S. Navy. They formerly had specified only specific gravity for naphtha for their motor boats and launches, and soon were utterly handicapped in purchasing this in various parts of the world. For instance, while they could easily obtain a product of



Port Arthur Works Laboratories

70 degrees Beaume specific gravity on the Eastern coast, this was an impossibility on the Western coast and in other countries, because the Pacific and other Western Oils are very much heavier than Pennsylvania oils, although the gasoline and naphtha products obtained from them are equally volatile and perhaps more useful.

'The volatility of two gasolines being equal, preference might well be given to the heavier one, as it has been shown recently that gasolines, which, for equal volatility, have a higher percentage of carbon, are the most efficient, because they give a stronger expansion stroke. This of course, is based on thermo-chemical conditions, the details of which are precluded by the limits of this paper. At any rate, it is a fact that the purchaser who buys gasoline by specific gravity alone, not only unnecessarily narrows the source of supply (which, of course, raises the price) but frequently deprives himself of the better product.' "

We find it advisable to make the larger or commercial divisions of the naphtha cut as follows:

Auto Gasoline
Varnish Naphtha
Texaco Spirits
Texene

In addition to the uses enumerated above, gasoline is used in large quantities by many manufacturing industries, including the manufacture of gas, rubber cements, patent leather, degreasing, other extraction processes, etc.

The varnish naphtha, Texaco spirits, and Texene are to some extent used for similar purposes, but are more largely consumed in the manufacture of soap, paints and varnishes, oil cloth, linoleum, etc. Texaco spirits and Texene are very satisfactory on account of having better solvent properties than the lighter products.

Texene is manufactured entirely from the Texas crudes, and is superior to products from any other crude as a solvent for varnish gums, etc.

KEROSENE The essential quality of a kerosene is its illuminating properties, and this can best be determined by burning under practical conditions in the ordinary domestic lamp. Fractional distillation, however, is also an important test in determining the quality.

Port Arth

Kerosenes are usually divided into three grades:

Water White
Prime White
Standard White

Many of our States and municipalities have laws or regulations governing the tests of oils used for illuminating purposes. These laws usually regulate only flash and fire, the fire test ranging from 110° to 150° F. A fire test of 150° F insures the removal of all naphtha or volatile products, and is about as high as can be made without seriously interfering with the illuminating quality. Such regulations without question are proper and very important as a safety provision, and mean that the oil as carried or stored in ordinary receptacles for domestic consumption will not generate sufficient gas to ignite and burn under this temperature.

Standard White Kerosene is almost entirely an export product, for consumption usually in the cheaper lamps and torches, where quality is of little consideration as compared with price.

In kerosene, as in gasoline, gravity alone is an unreliable guide or indication of quality. As an example, tests of a few samples of Water White recently secured from various crudes produced in the United States, all having practically the same illuminating value, are tabulated as follows:

TESTS OF WATER-WHITE ILLUMINATING OILS

	PENN. W.W.	OHIO W.W.	ILLINOIS W.W.	LOUISIANA W.W.	OKLAHOMA W.W.	CALIFORNIA W.W.
Gravity ° Beaume	47.6	46.0	42.6	47.6	42.0	39.9
Flash ° F	130	132	142	130	130	94
Fire ° F	150	155	165	150	155	110
Visc. at 60° F	375	375	375	380	375	275
Color	.9	3.6	1.5	3.0	2.5	1
Sulphur	. .	. .	. .	.019	. .	. .
DISTILLATION						
Start	296	298	316	320	322	280
10%	332	332	350	345	354	326
20%	354	354	368	375	368	342
30%	372	378	378	390	386	358
40%	390	402	392	411	408	376
50%	408	424	404	430	430	396
60%	428	446	420	458	448	416
70%	450	466	438	478	470	434
80%	470	492	460	500	490	460
90%	516	526	496	530	521	494
95%	546	552	522	555	555	530
End Point	592	588	572	590	592	540

rks

Some of the illuminating oil specialties are:

Lighthouse Oil
Miners' Oil
Railroad Signal Oil
Railroad Coach Oil

GAS OIL

Gas Oil is a distillate product used almost entirely in the manufacture of illuminating gas, for which there is a large trade both domestic and foreign. While as a rule these distillates are of such nature that they are not readily made into what we term "refined products," they are especially adapted to the manufacture of gas, and must meet certain specifications, one of the most general being as follows:

"85% to distil off between 400° and 700° F. The coke residuum shall not exceed ½ of 1%, and the oil shall not contain more than ½ of 1% of sulphur."

LUBRICATING OILS

The viscosity of a mineral oil is without doubt the best guide to lubricating value, and there are many forms of apparatus in use for determining this. The one now probably the most generally used in this country is the Saybolt Universal Viscosimeter.

To fully realize the importance of viscosity as a test of lubricating value, it is necessary to consider the laws of friction of fluids as applied to oils in the lubrication of machinery. It is not the intention to go into any of these matters in any great detail at this time, as each oil is a sufficient subject for study in itself, yet it is well to bear in mind that the friction of lubricated surfaces is usually the compound friction made up of friction of solids and the friction of liquids, and in most cases the object of lubrication is to carry the moving part on the lubricant, thus reducing the resistance to fluid friction. The more viscuous the oil the greater the weight or pressure that can be sustained. Excessive viscosity, however, creates unnecessary fluid friction, and the viscosity should be only sufficient to keep the moving surfaces apart under extreme conditions.

Machinery manufacturers and operators are realizing more fully the economy of the proper selection of lubricants for each particular purpose. As there are many classes of machinery and many weights, sizes, and speeds in each class, a variety of lubricating oils is required. Viscosity is the principal factor in determining the many divisions. The general classification is as follows:

Spindle Oils
Light Engine Oils
Heavy Engine Oils
Light Machine Oils
Heavy Machine Oils
Cylinder Oils
Black Oils

Some of the specialties are

Motor Oils
Gas Engine Oils
Turbine Oils
Dynamo Oils
Air Compressor Oils
Loom Oils
Ice Machine Oils
Semaphore Oils
Thread Cutting Oils
Car Oils
Marine Engine Oils
Gear Oils
Crank Case Oils

GREASES

Although they are lubricants, greases are properly in a distinct class, requiring separate manufacturing equipment. Our line is complete and includes

Cup Greases
Axle Greases
Transmission Lubricants
Rod Cup Grease
Driving Journal Compound
Car Grease
Pinion Grease

Gear Grease
Cog Grease
Hot Neck Grease
Cold Neck Grease
Hair Grease
Sponge Grease
Roaster Grease
Paper Mill Grease
Gear Shield Grease
Jack Post Grease
Comb Box Oil

PARAFFINE WAX — Our manufacture includes all grades of crude and refined waxes. The larger quantities are used in the manufacture of

Wax Candles
Wax Paper
Individual Service Packages
Floor Dressing
Lining for Butter Packages
Insulating Electric Apparatus
Burning in Miners' lamps
Sealing Fruit Jars, etc.

ASPHALT — Texaco Asphalt is furnished in all of the different grades and consistencies of

Paving Cement
Roofing Cement
Waterproofing Materials
Rubber Stocks
Saturating Compounds
Pipe Coating
Macadam Binder
Flux Oils
Road Oils

and for many other uses.

FUEL OIL — Fuel Oil has come to be one of the chief products of petroleum, constituting the greater part of the fuel used in the Western and Southwestern portion of the United States by railroads and industrial plants, and throughout other parts of the world for the same purpose, where oil is available.

The chief requirement of such fuel is that it shall meet certain safety requirements, contain the maximum heat units, be sufficiently fluid to be handled readily under varying climatic conditions, and be free from any foreign substances detracting from its fuel value.

The bulk of such fuels are crude oils, from which, through refining processes, the lighter and more volatile fractions, moisture, sediment, etc., have been removed.

One of the largest demands for this class of fuel is for marine equipment, including the navies of the United States, Great Britain, and many other countries.

There is also a constantly increasing demand for fuel oils of a distillate character, for consumption in a wide range of heating and power equipment, from household stoves to consumption in internal combustion engines driving some of the largest ships.

Our refineries are consuming about 12,000,000 barrels of crude oil per annum and are turning out over 200 refined petroleum products.

The foregoing is intended only as a rough and general outline of the principal operations and products of our manufacturing plants, but I trust is sufficient to impress every employee with the importance of care and intelligent action in every detail, whether he be engaged in the actual manufacture, or in construction, maintenance, preparation of packages, or shipping, or as a clerk whose figures, to be of value in accounting, costs, yields, etc., must be accurate.

Each refinery is supplied with trained chemists, with every necessary laboratory equipment, and competent superintendents to skillfully direct every operation.

Our selection of products is from four distinctly different crudes, one of which yields us our Texaco Motor Oils, engine oils, and turpentine substitutes, which cannot be equalled from any other American crude; another one yielding the highest grades of gasolines, kerosenes, and cylinder stocks; and one paraffine waxes and other products practically identical with the products of Pennsylvania crude.

Our asphalts and road oils are made from strictly asphalt-base crudes.

Those in charge of transporting and distributing fully appreciate the importance of care in handling and delivery to customer in perfect condition.

Our policy is high grade and uniform quality.

BY THE WAY

A LARGE contract for supplying gasoline and kerosene to the Panama Canal Commission was awarded to The Texas Company. The contract covers the period June 24, 1913 to June 30, 1914.

★ ★

A substantial saving in fuel is being effected by The Texas Company through heating the boilers in the refinery at Port Arthur, Texas, by gas. The gas is brought through one of the company's own oil pipe lines from the Caddo field. The pressure at the field is 900 lbs. and the gas is delivered to the consumption line at Port Arthur with a pressure of 120 lbs.

★ ★

The sinking near Tampico of the stern wheel steamer *Herman Paepcke* was reported by wireless to The Texas Company at Houston on Sept. 26. The Company had only recently purchased the vessel, and the trip on which she sank was her first, except in the river trade, made in our service. The *Herman Paepcke* was bound for Tampico and had almost reached destination when she sank while under tow of the towboat *Hornet* of the oil fleet of The Texas Company. All of the crew escaped. The vessel was of 157 tons, valued at $30,000. She was a stern wheel steamer meant for the tow service on the Panuco River, which enters the Gulf of Tampico. The Texas Company has only about half-a-dozen vessels like the *Herman Paepcke*.

★ ★

The leading event of the month of September at Electra was the completion on Sept. 9th of Producers R. S. Allen No. 1, flowing almost 2,000 barrels a day—as large as, if not larger than, any well ever finished in the field.

★ ★

The Texas Company has cut its Oklahoma runs to about 14,000 barrels a day, because it is taking 14,000 barrels a day from Electra. The latter comes into the Tulsa-Port Arthur trunk line at Dallas. As the Electra field appears to be increasing its production the present arrangement may continue indefinitely.

The gasoline-from-casinghead-gas industry is developing rapidly in all the fields west of the Mississippi River. New plants, some of them on an extensive scale, are being installed every week.

★ ★

Mr. H. Tipper, Manager of the Advertising Division of the Sales Department, has conducted a two-years nation-wide campaign which proved so efficient that *Printers' Ink* presents it as a model of skill and energy, in an extended article telling "How The Texas Company Built a National Campaign." Readers are referred to the article in *Printers' Ink*, Sept. 18, 1913, for the interesting details of Mr. Tipper's plans. The expert critic sums up: "If that isn't a triumph for *advertising as advertising*, I don't know what is."

★ ★

Mr. W. F. Parish, manager of the Lubricating Division for Northern Territory of the Sales Department, on Oct. 2, before the semi-annual convention of the National Association of Cotton Manufacturers at Atlantic City, read a paper on "Developments in Lubrication with Special Reference to the Use of Southern Crudes." Mr. Parish's paper, which was highly appreciated by the convention, explained the value of laboratory tests, and referred to a previous paper on the "Economic Possibilities of Good Lubrication," in which he had given the results of twenty power tests. In regard to general principles he said, in part:

"As to the general laws governing lubrication, these have been well established by such investigators as Dr. Thurston, Dr. Woodbury, Dr. Mabery, Dr. Holde and Dr. Engler. The rule is that within limits a reduction in the viscosity of a lubricant will bring about a reduction in the co-efficient of friction, or a reduction in temperature and in lost power. Most of the resistance or lost power in running machinery is caused by the internal friction or the fluid friction in the lubricant used, assuming that an average condition with an average oil is under consideration. It is only occasionally, through the use of a very improper oil or lack of feed of a proper oil, that actual metal wear on properly constructed bearings takes place. Wherever bearings are flooded, or where a proper working oil film is maintained, a very large proportion of the frictional loss is directly due to the internal, fluid friction of the oil itself, and this can be influenced one way or another along certain prescribed lines."

★ ★

W. L. Day, vice-president and general manager of the General Motor Truck Co., calculating that one motor truck replaces six horses, finds that to handle only ten per cent.

of the transportation required in the large centers, 500,000 trucks would have to be produced. In 1900 there were about 27,000,000 horses in this country; in 1912 there were approximately 30,000,000. It is estimated that in the same time transportation work has increased threefold, while the increase in the number of horses has been only twelve per cent. "Contrary to the usual impression," says Mr. Day, "retail and jobbing—not manufacturing centers—are the big fields for mechanical haulage and delivery."

★ ★

The Brooklyn Chemical Company keeps tab on the operating expenses of its motor trucks. They find the total cost per ton mile, including the proper reserve fund, to be twelve cents.

★ ★

Uncle Sam is spending twenty million dollars to build up motor boating on the Mississippi River between St. Paul and St. Louis. This may seem like an extravagant statement, but it is true figuratively and literally, for in expending this immense sum to provide a six-foot channel the benefit will accrue to motor-driven craft and not to the old-fashioned type of steamboat. Those who have watched the development of transportation facilities on the Mississippi River are convinced that the steamboat is done for, and that in its place will come—has already come—the motor-driven boat with its internal combustion engines. Already scores of motorboats are engaged in transportation service between cities on the river between St. Paul and St. Louis and in almost every instance they have been successful financial undertakings, where steamboats undertaking to operate a similar business have failed. The motorboat is operated with more economy. A smaller crew is required, the fuel expense is less, as is the upkeep, while the original investment is nowhere near the same as what was needed in the days of the steamboat. The motorboat makes as good or better time and is capable of the same hauling capacity with the aid of barges.

Indicating that this change in the order of things is being recognized by the Government is the appropriation of half a million dollars, in connection with the Rivers and Harbors Appropriation Bill, to be used in conducting experiments in the design and construction of two experimental towboats of different types for use on the Mississippi River and its tributaries. It is apparent the Government authorities realize that the future of river transportation lies in the successful development of the motor towboat and barge system, generally used on the rivers in Europe. A board of four officers of the corps of engineers was appointed to make the investigations. . . . Two members of the board have spent about three months in Europe inquiring into transportation on European waterways. Several tests have been made at the model tank at Ann Arbor, Michigan, of barge models of various types and resistance of radial and feathering wheels. The tests were witnessed and discussed by the board members and by Professor Sadler, of the University of Michigan, who conducted the tests under the board's direction. . . . The Government is not considering the installation of a Government service, but is securing the figures with the purpose of interesting private capital in the enterprise.—*W. V. Kidder* in *Motor Boat.*

★ ★

A good road turneth away wrath and a permanent highway is a joy forever. No other construction will give as complete satisfaction as that of a well built highway. Everybody loves a good road and a good road makes us love everybody. It helps to keep the community in a good humor. Build roads and be happy.—*Homer D. Wade,* Secretary Texas Good Roads Association.

★ ★

Prof. C. B. Austin of the University of Texas, who was one of the American commission to study European rural credits, says: "Cooperation does not come through the law; it comes through the spirit. . . . The adoption of any system of improved finances for the farmer, or a system of cooperative marketing, is not a question of constitution and by-laws. My European experience led me to believe more strongly than ever that it is a question of the underlying social forces."

★ ★

The young man who is leaping out after power has to handle his job to the best of his ability, endeavoring day by day to handle it

with less effort or greater efficiency. That will make him supreme at the particular job which he is handling. But in addition he must inform himself on the other departments of business. Once he has mastered his job, he has no extra knowledge with which to get a better one, unless he has beforehand provided himself with information and training that enable him to do more and better work.—*Thomas E. Dockrell.*

"I don't object to a man tellin' all he knows," said Uncle Eben, "if he sure-enough an' honestly knows all he tells."—*Washington Star.*

★ ★

Mistress—In the time it takes me to tell you how to do the work I could do it myself.

Housemaid—Yes'm. And in the time it takes me to listen to you, so could I.—*The Jester.*

DEPARTMENTAL NEWS

The Managers of the respective Departments have assigned to the gentlemen whose names and addresses are here given the duty of sending to the Texaco Star, on or before the tenth day of each month, reports of new appointments, transfers, removals, resignations, promotions, and other items of departmental news of general interest. Suggestions and information for this purpose should be sent to them before the tenth day of the month. All are invited to cooperate.

Pipe Line Dept.	————
Natural Gas Dept.	————
Fuel Oil Dept.	E. B. Joyner, Houston.
Refining Dept.	C. K. Longaker, Houston.
Marine Dept.	W. S. Conover, Houston. A. R. Weber, New York.
Legal Dept.	————
Treasury Dept.	Lee Dawson, Houston.
Comptroller's Dept.	B. E. Emerson, Houston.
Sales Dept., S. Territory	D. A. Vann, Houston.
Sales Dept., N. Territory	S. Slattery, New York.
Export Dept.	————
Purchasing Dept.	J. E. Byrne, Chicago.
Railway Traffic Dept.	C. S. Young, Houston.

FUEL OIL DEPT. John Nicholson, R. R. Lubricating Expert, after a few days at Houston headquarters, left on October 6, for a trip over his territory.

I. P. Chidsey had a good prospect of winning the trip to the World Series offered by the *Houston Post*, but withdrew on account of not having time to get votes.

R. J. Golding, stenographer for Vice-President, G. L. Noble, has been on leave of absence for thirty days, his position being filled by Mr. Frain from the general office.

REFINING DEPT. Mr. and Mrs. F. T. Manley returned to Port Arthur September 20, after spending a month in Salt Lake City and Yellowstone Park.

Dr. G. W. Gray returned to Houston September 27, after spending three weeks in the North. While in the North Dr. Gray attended the meeting of The American Chemical Society, held in Rochester, N. Y.

Mr. W. K. Holmes, Assistant Superintendent at West Dallas Works, has been in charge of West Tulsa Works during the absence of Superintendent T. Mullin.

Mr. E. H. Daniel, Chief Clerk of the Port Neches Works, spent a few days in Houston.

Mr. A. E. Price of the Terminal Department, New York, resigned his position. Mr. Price will enter Cornell University to finish a course in Engineering.

Mr. J. D. Dodge has been transferred from Lockport Works to Charleston Terminal. Mr. Dodge assumes the Chief Clerkship at Charleston.

We take great pleasure in announcing the marriage of Miss Katherine, daughter of Mr. and Mrs. W. T. Cushing, to Albert S. Alston. The ceremony took place in Dallas, Oct. 5. Mr. and Mrs. Alston are receiving the congratulations of their many friends.

Mr. Earl Casey, formerly of the Utah Oil and Refining Company, has joined the Refining Department forces at Lockport Works.

Mr. T. Mullin, Superintendent of our West Tulsa Works, has returned from his vacation. Tim reports having had a good time, and the boys around Tulsa are glad to see him back.

Mr. and Mrs. R. L. Drake have returned to Port Arthur after a delightful vacation in Michigan and the Canadian Rockies.

Mr. E. B. McGeever of the Houston office spent several days in Birmingham, Alabama, visiting his relatives. Mac has only been in Texas a year, but he has caught the "Texas Fever," and is glad to get back to Houston.

Mr. Frank Nice of the Houston office won the "Bachelor of Ugliness" contest at the Y. M. C. A., September 26. Texaco Products are always winners, and Frank won hands down. We are very sorry that lack of space prevents publishing his photograph.

Mr. J. C. McCabe has been transferred from the West Dallas Works to the West Tulsa Works. Mr. McCabe will look after the inspection of the tank cars at West Tulsa.

Mr. J. L. Barringer, formerly employed at the Delaware River Terminal, resigned his position. Mr. A. H. Rickets has been transferred from Bayonne to take his place.

Mr. F. A. Nolan has been transferred from Providence to the Sales Department, Newport, R. I.

Mr. D. J. Dillabough resigned his position at Port Neches Works.

Mr. B. G. Willeford has been transferred from West Dallas Works to Port Neches Works. Mr. Willeford finds life along the Neches very pleasant.

Mr. C. C. Hawkins was called to Cincinnati, Ohio, on account of the illness of his mother.

Mr. F. T. Manley left last Monday night for Shingle House, Pa. Mr. Manley received word of the serious illness of his mother.

Dr. K. G. Mackenzie, Consulting Chemist, who has been spending several weeks at Port Neches and Port Arthur, has returned to Bayonne.

MARINE DEPT. Mr. G. C. Wagener, Jr., who has been substituting for Mr. R. C. Butler, agent at Port Arthur, during the latter's vacation abroad, is expected to return to this office about Oct. 10. Otherwise, nothing to say except that we are

looking forward with interest to the first issue of the *Texaco Star*.

TREASURY DEPT. Mr. T. H. Jackson, file clerk in General Creditman Symms' office, has tendered his resignation. Raymond Snyder, bank messenger and multigraph operator in the General office, has been promoted to the position made vacant by Mr. Jackson's resignation. Raymond is an energetic worker and is deserving of the promotion accorded him.

SALES DEPT. S. TERRITORY Superintendent Cook of the Atlanta District reports good business in Lubricating and Specialty trade. The gains show every man pushing "The whole line all the time."

Superintendent Jones at New Orleans reports a large number of contract renewals at "quality" prices, winning over the low price oils offered as "just as good."

Superintendent Garrett leaves many warm friends in the South and renews acquaintance with as many more at Chicago.

Superintendent Galbraith in moving to Tulsa District leaves a record in the Pueblo District which will require the hardest work to duplicate. Look for Motor Oil gains.

Superintendent M. J. Monroe reports gratifying progress in future orders in the Pueblo District. Several carloads already from the country trade.

The Joint Meeting of Sales Managers, Superintendents, and Lubricating Salesmen of Northern and Southern Territories, held in New York October 2–4, was exceedingly profitable and pleasant to the Southern representatives. It would be impossible to express with many words our appreciation of the courtesies and kindness of our genial hosts. Innumerable arrangements for diversified entertainment greeted us after every session. There was no limit to such hospitable resources for interspersing the business and the pleasures of the occasion. Much was learned, and all was enjoyed. It will long be a green spot in memory. We want to reciprocate, and we want to "come again."

It is reported by some of the Southern Superintendents who were in attendance at the recent Joint Meeting in New York, that the statistics in Mr. Tipper's office on the paper having the largest circulation in the United States were wrong. But Mr. Tipper now has the correct information.

A Southern Superintendent, at the New York meeting, fell and broke one of his ribs; says it happened in the bath room.

One of the Southern representatives, innocent of the gaieties of Gotham, was deeply stirred at the Hippodrome when he saw fifty girls march off the stage into deep water to an heroic death by drowning. Shocked by the excesses of a decadent civilization, he protested passionately against such a wanton sacrifice of life for the amusement of a heartless populace.

COMPTROLLER'S DEPT. Mr. Ira McFarland left Oct. 1, on his vacation, which he will spend in Bradford and Pittsburgh, Pa., and in New York City.

Mr. B. J. Durkin, for the last two years station auditor in the North, has been transferred to the Southern Territory.

Mr. J. W. Luttrell has left the Company to look after his personal interests in Arizona. He is succeeded by Mr. G. M. Redwine, heretofore of the Sales Department, Southern District Office.

Mr. W. J. Bissonet, for a number of years connected with the Southern Pacific Railway, commenced service with The Texas Company October 1, in the Comptroller's Department.

Mr. G. C. Elliott, for a number of years with the Sales Department, has been transferred to the Comptroller's Department and is at present assisting Travelling Auditor Horrigan at Dallas, Texas.

SALES DEPT. N. TERRITORY Mr. Karl T. Kirk, formerly of Cleveland, O., has entered the employ of the Company as Operating Inspector in the Boston District.

Mr. Walter E. Dorn, formerly salesman and Tank-wagon Solicitor at Albany, N. Y., has re-entered our service in the Boston District.

Mr. Leonard O'Malley of the New York District has just returned from Minneapolis, Minn. where he has been attending the Annual Convention of the National Paint, Oil, and Varnish Association. Many of the largest paint and varnish manufacturers are already our customers. Dr. K. G. Mackenzie, of the Bayonne Laboratory, accompanied Mr. O'Malley to look after our interests from a technical standpoint.

Mr. S. S. Tompkins has resigned his position as Agent at the Brooklyn-Clinton Street Station and will be succeeded by Mr. E. L. Holloway, who has been salesman in New York City and vicinity for the past two years.

Mr. J. M. LaFrance, formerly salesman in New York City, has been promoted to take

charge of the Lubricating Salesmen of the New York District.

Much rivalry was exhibited during the month of June when prizes were offered to the Refined Stations in the New York District. Gallonage, Motor Oil Sales, General Appearance of Stations, Rendering of Reports, etc., were considered, the first prize going to Youngstown, O., and the second to Schenectady, N. Y. Several other stations were close enough in the running to warrant the winners being on their mettle in the next contest.

Mr. W. O. Andrus of the Chicago District has returned from a successful trip among Canadian trade, proving that new consumers appreciate quality, and, when offered, are willing to pay for it.

Mr. O. J. May, Lubricating Engineer of the Chicago District, has completed a test of our Texaco Motor Oils at a large automobile factory, running over all the best known automobile oils in the market. The test, covered in a paper read before the New York Joint Meeting, is most complete and satisfactory.

Superintendent H. T. Snell appeared to be as popular at the meeting as with the trade. Higher compliment impossible.

The many acquaintances of Mr. A. F. Garrett are welcoming his return to Chicago, where he is again located.

Mr. W. H. Openshaw, Engineer connected with the Boston office, recently reported three very exciting events—First: "The Green Economizer blew up, wrecking the Boiler House." Second: "The engine ran away this noontime. There was something the matter with the governor. This is certainly no place for a nervous man." Third: "I shall be away until Wednesday—going to be married."

Mr. Geo. R. Rowland, of the New York office, who is Supervising Engineer of the Eastern Sales Division, was making inspection of a large steel mill where they were using Gas House Tar for gear lubrication. In walking over the pit into which this tar had been drained, his attention was attracted by some competitive oil barrels, and in trying to read the name on the heads of these barrels he lost his balance and fell into the pit. He was fished out, wrapped in heavy paper, put into an ambulance and sent to the hotel. No damage was done Mr. Rowland personally, but he lost all of the clothing he wore. He said he was glad that it was Gas House Tar that was in the pit, as, if it had been Crater Compound, he would be trying yet to get it off.

Mr. J. J. Simon, of the Philadelphia District office, held the center of the stage for over forty-eight hours on a stretch at an electric power station in Pennsylvania where our Turbine Oil was in use. The employees went out on a strike, first carefully mixing up the signs on the switchboard and draining the Turbine Oil off into the river. Engineer Simon was appealed to by the owners of the plant to help them out, as it was feared that they would lose their franchise if power was not furnished continuously. Mr. Simon took hold and kept the plant running; was on the job continuously until completely exhausted. The plant was kept operating—a fact that was very much appreciated by the owners.

Mr. C. E. Van Bibber, of the Boston office, who attended the speed trials of the U. S. S. *Florida* two years ago, was specially invited to attend the trials of the Argentine battleship *Rivadavia*, built by the Fall River Shipbuilding Company. Texaco Ursa Oil was used in the entire lubricating system for the main turbines. Our Ursa Oil proved itself capable of caring for the entire lubrication, even under excessive conditions of speed, and everybody was pleased with the performance of this oil.

Four Texaco Motor Oils and ten competitive oils were recently tested at the plant of the Willys-Overland Company, Toledo, Ohio. Mr. O. J. May and Mr. C. E. Jackson, of the Chicago office, and Mr. Frank H. Knight of the New York office, assisted by five engineers of the Overland Company, worked on these tests, which required seven weeks to be completed. All of the oils were tested under letter, no one on the test knowing the names of the oils. The results show that the Texaco Oils were the most efficient in every way. One of the most remarkable features was that with the Texaco Oils only soft sooty carbon was formed, while every one of the competitive oils formed a hard carbon that was exceedingly difficult in some cases to remove. The motor operating with Texaco oils showed a greater horse power with less consumption of gasoline and lubricating oil, with high thermal efficiency and better mechanical efficiency. These tests are probably the most remarkable that have ever been conducted for the purpose of showing the effect of lubricating oil upon the power of a gasoline motor. The details are being carefully worked up and will be presented by Mr. Ammon, Chief Metallurgist, to various technical societies. We will have the privilege of using the results of the tests.

On October 2, Mr. W. F. Parish, of the New York office, read a paper before the National Association of Cotton Manufacturers, the subject being "Improved Lubri-

cation With Special Reference to the Use of Southern Crudes." This paper has been reprinted and can be secured in the various sales offices.

The first Joint Meeting of Sales Managers, Superintendents, and Lubricating Salesmen of the Northern and Southern Territories was held in New York, October 2 to 4. The sessions conducted by Mr. C. E. Woodbridge were along the lines of the regular monthly meetings of the Northern Superintendents which have been held for the past two years. Comparative statements of various kinds were shown by lantern slides and seemed from the discussion to create as much interest among our visitors as they have heretofore among the Northern representatives. Papers outlining their work were read by Messrs. W. A. Thompson, Jr., Harry Tipper of the Advertising Department, J. C. Ostrup of the Equipment and Construction Division, and W. H. Kershaw of the Paving and Roads Division. One session was devoted to the Station Operating Inspectors during which their routine work was discussed, and another to the Lubricating Engineers of the various Districts. Interesting and instructive papers were read. Each session brought forth a discussion very beneficial to all and the consensus of opinion was that similar meetings should be held at stated intervals. To impress on the Southern Representatives our appreciation of their attendance, and as an incentive to come again with the ladies, theatre parties were arranged for each evening, as well as shopping and sightseeing tours during the day. A boat trip around Manhattan and a luncheon at the Whitehall Club were enjoyed on Saturday. The meeting was brought to a close on Saturday evening with a beefsteak dinner which was attended by the Executives and Heads of all Departments. It was a most enjoyable affair.

Texaco for the "Texas." Everyone connected with The Texas Company will be interested in knowing that the magnificent new battleship named for the State of Texas will use in the dock trial on October 6, at the builders' plant at Newport News, Va., Texaco Ursa Oil.

The *Texas* is the largest battleship that has been launched by the Government, and this fact, in connection with her being named for the State of Texas, made the securing of this business especially desirable. A large number of obstacles which seemed at first unsurmountable were encountered, not the least being the fact that the oil for this trial trip had already been ordered from another company. The *Texas* has not yet been turned over to the Government, and all negotiations had to be conducted with the builders. The builders had been using for a number of years in all dock trials lubricating oils furnished by one of our competitors. We concentrated the entire Lubricating department of the Norfolk District on the enterprise, and, assisted by the General Lubricating Division in New York, set out to capture the battleship.

We had successfully interested the Navy Department officials who will have charge of the *Texas*, through the remarkable success of our lubricating oils on the battleships *Florida* and *Delaware*, and while they had nothing to do with the oils used in the dock trials, this interest had a great bearing on the final decision of the shipyard people.

This trial will be especially valuable to The Texas Company, as the builders will use our oil on one engine and a competitor's oil on another, thus giving a basis for comparison under exactly similar conditions. We have no doubt that Texaco Ursa Oil is superior to that which is being furnished by our competitor and better suited for forced-feed lubrication of large reciprocating engines such as are used on battleships, and have high hopes that when the ship goes on her trial run Texaco will be used exclusively. We understand that the *Texas* shortly after she goes in commission, which will be some time in December, will visit Galveston and other Texas points, and if she does, we trust everyone concerned will keep her filled up with Texaco.

PURCHASING DEPT.

"No changes in the Purchasing Department month of September.—*J. E. Byrne.*"

RY. TRAFFIC DEPT.

Mr. Considine has returned to Houston after an absence of several weeks. He visited Chicago on Company business, and spent a vacation in Dubuque.

Mr. Wm. Kehoe, who began service with this company several years ago as a messenger boy and succeeded to the Railway Traffic Department, has been transferred to the Sales Department. This is a promotion for Billy.

SUGGESTIVE INDEX OF ARTICLES IN CURRENT PERIODICALS

THE MAIN INTEREST IS INDICATED BY

DEPARTMENTAL CLASSIFICATION OR BRIEF COMMENT

EXECUTIVES

Depreciation in its Relations to Investments, Earnings, and Value, by R. S. Hale—*The Engineering Magazine*, May, 1913.

A striking and able article, well worth perusal by all directors of large enterprises. A following article, especially interesting to directors and constructive accountants, is of similar importance. It is the fifth of a series on "Practical Principles of Rational Management," by A. Hamilton Church, entitled "What to Record."

The May issue of the *Engineering Magazine* was an unusually rich number. Besides the two leading articles and other valuable matter, it contains a study by Harrington Emerson in which the "twelve principles" are applied to the Pittsburgh and Lake Erie Ry., and a detailed description of "A Recent Kerosene Automobile Engine"—a four-cycle motor, starting and operating on kerosene, with normal compression and using neither carburetor nor compressed air. Two French firms of high standing are said to be preparing to construct this new motor—called the Bellem, from the name of the French engineer who, it is said, has perfected it.

Advantages of Meeting Depreciation Exactly—*N. Y. Times Annalist*, Sept. 15, 1913.

Abstract of the important address by Pres. Alexander C. Humphreys to British Institution of Gas Engineers, as representative of American Gas Institute.

Safety Engineering, by G. Gilmour—*Scien. Am. Sup.*, July 19, 1913.

Prevention of industrial accidents.

The Oil Quest, Interesting Features of the Pearson Concessions in Ecuador and Colombia—From *The London Economist* in the *Annalist*, Sept. 22, 1913.

The Pearson Concessions—*Annalist*, Oct. 6, 1913.

Rights for oil exploitation in Colombia and Ecuador not yet confirmed.

Causes of Failures in Efficiency Work, by F. W. Collins—*The Engineering Magazine*, Sept., 1913.

"The work of organizing is more apt to be suited to an analytical mind, while managing should be the function of a leader—an inspirer of men. This difference is essential, and failure to appreciate its significance accounts for many corporation ills."

Scientific Management a Mental Attitude—*The N. Y. Times Annalist*, Aug. 18, 1913.

Efficiency and the Worker, by H. R. Callaway—*Engineering Magazine*, Aug., 1913.

"The question as it appears to the man on the job."

Premium, Piece Work, and the Expense Burden, by A. Hamilton Church—*Engineering Magazine*, Oct., 1913.

A comparison of wage systems, in a scientific investigation requiring very close reading or study. A succeeding article is announced which will take up the "bonus" and "efficiency" systems.

Future Contract Prices, by Alex. Del Mar—*The Engineering Magazine*, Oct., 1913.

Attempt to show tendency of prices and costs in the periods of time for which large enterprises of construction or production must provide.

NATURAL GAS

The Cleveland meeting of the Natural Gas Association of America—*Natural Gas*, June, 1913.

Some addresses are printed in full, among them President Daly's address; an address by Judge Silas M. Douglass, General Counsel of the Logan Natural Gas and Fuel Co., of Mansfield, O., entitled "The Good of the Order," mainly explanatory of the development of the Sherman Act decisions of the Supreme Court; and two papers on "Conservation of Natural Gas," by George B. Sipe, followed by discussion.

Natural Gasoline from Casinghead Gas: Cost, Yield, and Market—*Fuel Oil Journal*, Sept., 1913.

"An important industry, and is growing so fast that any reliable information is read with interest by all concerned in the oil and gas industry."

An Expert Gives Facts and Figures on Gasoline from Gas Industry—*Fuel Oil Journal*, Oct., 1913.

Cleaning Gas by Schwarz-Bayer Process—*The Iron Age*, Aug. 7, 1913.

Abstract of article in *Stahl und Eisen* for April 17, 1913.

FUEL OIL AND REFINING

"Liquid Fuel," by Prof. Vivian B. Lewis, F. I. C., F. C. S., etc.—*Automobile Topics.* Series of articles (by special permission of the Royal Society of Arts) beginning July 26 issue.

"Fuels for Heavy Oil Engines," by Irving C. Allen—*The Engineering Magazine*, Sept. 1913.
Tentative specifications of favorable characteristics.

"The Oil Problem"—*The Annalist*, Sept. 29, 1913.
"What is to be done with kerosene?" The outlook for. New refining processes.

"Camphor Does Not Increase Power"—*Automobile Topics*, July 26, 1913.
Tests showing that its addition to gasoline makes no difference in power or consumption of fuel.

The Water Content of Oil—*Oil and Gas*, Sept., 1913.
Notice of a bulletin issued by the Bureau of Mines. Various methods of determination of water in petroleum and its products classified and compared.

Asphalt Paving Cements and Road Binders, by J. W. Howard, C. E.—*Engineering Record*, Sept. 27, 1913.
Qualities claimed to be necessary, and laboratory methods for determining them. Mr. Howard contends that tests for specific gravity, fixed carbon, paraffine, sulphur, etc., have little or no bearing on the qualities that are required in paving work.

The Tool Room in Scientific Management, by Robert Thurston Peck—*The Iron Age*, Sept. 4, 1913.

Possible Economics in Shop Transportation, by Robert Thurston Peck—*The Iron Age*, Aug. 7, 1913.
Devices for reducing time between machine operations.

A New Type of Factory Floor—*The Iron Age*, Sept. 4, 1913.

Cost Data on Blueprinting—*Engineering News*, Sept. 25, 1913.

SALES ADVERTISING

How To Handle Cuts Efficiently in the Advertising Department—*Advertising and Selling*, July, 1913.
Suggestive for any extensive filing.

How I saved $2,500 by Applying Psychology, by Harry Tipper—*Advertising and Selling*, July, 1913.

Four Hundred Per Cent. Increase in Two Years—How the Texas Company Built a National Campaign, by Ray W. Johnson—*Printers' Ink*, Sept. 18, 1913.
An interesting account of Mr. H. Tipper's effective methods.

Turning Current Events into Good Advertising, by Charles W. Hurd—*Printers' Ink*, Sept. 4, 1913.

Building the Catalogue to Fit the House Policy, by Paul E. Ryan—*Printers' Ink*, Sept. 4, 1913.

Master Butchers Talk Truck Deliveries—*Motor Age*, Sept. 4, 1913.
Cost; horse barns unsanitary (flies); comparative experiments.

ROADS LUBRICATING

Modern Bituminous Roads and Pavements, by F. C. Ford—*Chemical Engineer*, July, 1913.
Types of construction in which bituminous materials are used.

Speedway Tests Show Fuel and Power Consumption of Electrical Lighting Systems, by R. H. Combs—*Automobile Topics*, July 26, 1913.
An analysis of the cost and reliability of electric lighting for automobiles. The conclusion that such lighting is a step in wrong direction, tending to diminish number of cars used, is of interest to oil men.

Problem of Economic Road Construction—*Engineering News*, Sept. 25, 1913.

Oil as a Supplementary Fuel in Steam-Power Plants, by Reginald Trautschold—*Engineering Magazine*, Aug., 1913.

EXPORT — Significant Features of This Year's Exports of Petroleum Products—*Oil, Paint, and Drug Reporter*, Sept. 1, 1913.

A general gain is shown of 9.50% in volume and 19.82% in value over same period (first 7 months) last year.

RAILWAY TRAFFIC — Daily Mileage of an Average Freight Car—*Annalist*, Aug. 18, 1913.

Car Surplus and Shortage—*Annalist*, Sept. 15, 1913.

GENERAL — Organized Thrift—*Annalist*, Aug. 18, 1913.

"The building and loan associations seem to offer an answer to the question how efficient investment of savings, and ready credit, may be provided for people of small means."

The Story of Harrington Emerson, by Herbert N. Casson—*Review of Reviews*, Sept., 1913

"Just as there was only one book in 1865 which gave a general explanation of the theory of evolution—Darwin's 'Origin of Species,' so there is today only one book which gives a general explanation of the Efficiency movement—Emerson's 'Twelve Principles of Efficiency' . . . The total literature of Efficiency would hardly fill a five-foot shelf, and most of the books are special studies of one problem or one trade. . . . Emerson has been from the first much more than a pioneer . . . He is at all times a guide over the whole field . . . He has come to be generally regarded as the one man who can best represent his fellow experts. . . . The only member of the original Efficiency group who was fortunate enough to have had both an engineering and a pedagogic education."

Good Roads and Power-Machinery—Influence on Civilization—*Manufacturers' Record*, Sept., 1913.

Museum in Memory of Col. E. L. Drake—*Oil and Gas*, Sept., 1913.

A memorial museum in which the relics of oildom may be preserved, especially the literature of the great industry.

American Petroleum Society—*The Petroleum Gazette*, Sept., 1913.

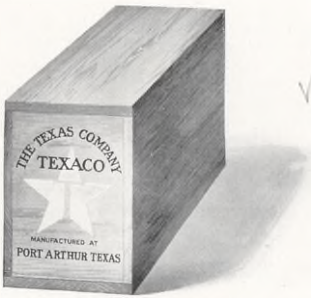
A new society launched at Pittsburgh meeting. It extends into almost every State in the Union. President, C. D. Chamberlin of the National Petroleum Association, Cleveland, O.; Secretary, Dr. Irving C. Allen, U. S. Bureau of Mines, Pittsburgh, Pa. The membership includes all branches, from chemists, producers, refiners, to the driller.

The Age of Oil, by Lewis R. Freeman—*Review of Reviews*, Oct., 1913.

California Established Another Record in Output; Wyoming Attracting the Big Interests; Canadian Natural Gas and Oil Development; Oil Possibilities of Northern Alberta; Improvements in the Market All Along the Line—*Fuel Oil Journal*, Sept., 1913.

Experiences in Efficiency, by Benjamin A. Franklin—*Engineering Magazine*, Aug. and Sept., 1913.

A series of articles to be continued, without promise of uninterrupted sequence every month, through the winter and spring.



Wanted—Your Ideas

In your work in the producing, manufacturing or distribution of Texaco products, YOU have personally seen or thought out some reason for their value. Put this idea into an advertisement and send it to us.

Can't write?

Can't draw?

Just make something like this—

we will understand what you mean.

Perhaps you are not fully acquainted with the products we are advertising. If that is the case just drop us a post card and you can have all the printed matter on the Texaco products that we have.

THIS IS A MONTHLY COMPETITION.

We will print the best suggestion sent us, in the January 15th issue of "The Texaco Star," giving the name of the employee sending it in.

If the idea is available, we will use it in our national magazine or newspaper advertising, as the case may be.

This competition is open to everybody.

Send in at least one idea.

We don't care whether you are an office boy or a superintendent.

We want that idea.

Put on your "thinking cap." Get up that idea and send it in.

This competition is not open to members of the advertising division.

ADVERTISING DIVISION

NEW YORK OFFICE