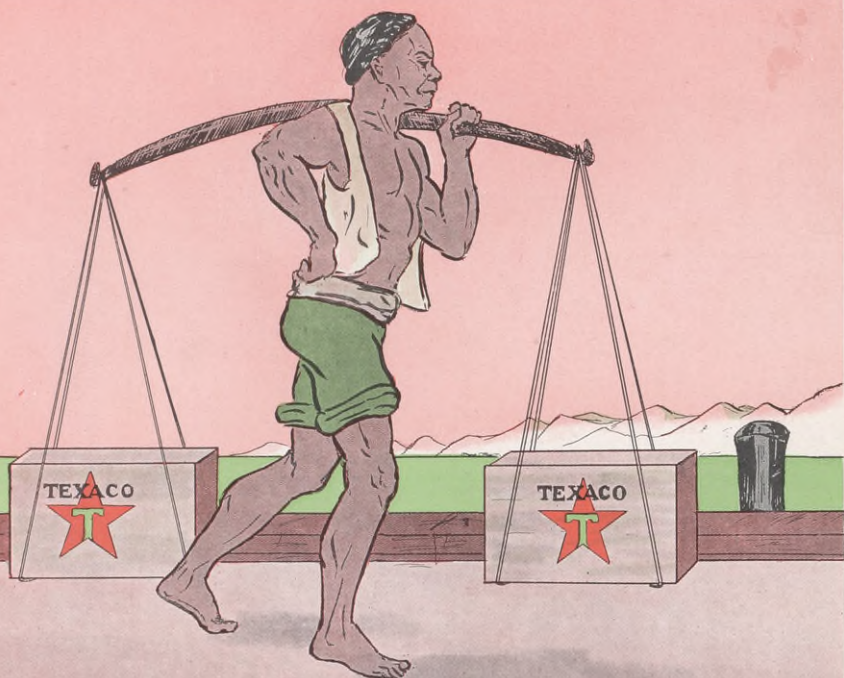


The TEXACO STAR



Export Department Staff

New York Offices

J. R. Miglietta, Manager

W. B. Knight, Asst. Manager W. C. Wallace, Acting Asst. Mgr.

General

O. Guelcher, Accounting J. B. Nielsen, Codes

Divisions

SALES

Asiatic Territory :
Australasian Territory :
Newfoundland District :

}

W. B. Knight
★ P. G. Elliott, Asst.

African Territory :

W. C. Wallace
G. A. Chadwick, Asst.

South American Territory :

C. Chasegreen
W. G. Moore, Asst.

LUBRICATING :

F. H. Schlesinger

CHARTERS, RATES AND ROUTING : M. D. Greer

STATISTICS AND RECORDS :

E. A. Pelouze

★ P. G. Elliott's association with The Texas Company was discontinued
February 4, 1914.

EFFICIENCY insists upon a determination of standards of achievement—equitable and reasonable standards, by which the ratio of useful result secured to the effort expended or the expense incurred in any given case, may be compared with the ratio that should exist in a normal utilization of the agencies at hand. Efficiency does not demand nor even encourage strenuousness. It does not impose nor even countenance parsimony. It merely demands equivalence—equivalence between power supplied and work performed; equivalence between natural resources utilized and products obtained; equivalence between attainable degrees of security and the actual proportion of casualties; equivalence between production capacity and finished product.

—Charles Buxton Going.

Efficiency is to be attained, not by individual striving, but by establishing, from all the accumulated and available wisdom of the world, staff-knowledge standards for each act—by carrying staff standards into effect through directing line organization, through rewards for individual excellence, persuading the individual to accept staff standards, to accept line direction and control, and under this double guidance to do his own uttermost best.

—Harrington Emerson.

EXPORT DEPARTMENT STAFF



1. J. R. Miglietta, Manager
2. W. B. Knight, Asst. Mgr.; Asiatic, etc. Ter.
3. W. C. Wallace, Acting Asst. Mgr.; African Ter.
4. C. Chasegreen, South American Territory
5. F. H. Schlesinger, Lubricating
6. M. D. Greer, Charters, Rates and Routing
7. O. Guelcher, Accounting
8. P. G. Elliot, Asst. Asiatic, etc. Ter.
9. G. A. Chadwick, Asst. African Ter.
10. W. C. Moore, Asst. So. Am. Territory
11. E. A. Pelouze, Statistics and Records
12. J. B. Nielsen, Codes

New York City

TEXACO STAR

VOL. I

FEBRUARY, 1914

No. 4

PRINTED MONTHLY FOR DISTRIBUTION TO EMPLOYEES OF
THE TEXAS COMPANY

"ALL FOR EACH—EACH FOR ALL"

Copyright, 1914, by The Texas Company

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

"EVERY sale a sample," phrases a sound principle of business building.

★ ★

An industrial organization, to attain full success, must not only supply at all times a satisfactory product, but the goods must reach the purchaser in the hour of his need. The latter condition constitutes a more searching test of organization than the former. A recent instance of co-operation—team work—between the Refining, Railway Traffic, and Sales Departments of The Texas Company affords gratifying evidence of organization of the right sort.

A consumer had received from a competitor a delivery of oil that was found to be unsuitable. Late in the afternoon of February 4, the Sales Department got the rush order for a car of paraffine gas oil. The order and the circumstances were telephoned to the Port Arthur Works. The oil required was not the regular run or available for loading in the usual way, and it was after working hours. In many organizations this would have caused delay. Not so with our Refining and Traffic Departments. A tank car was loaded that night, dispatched from the Works at 6:15 A. M., left Beaumont at 10 A. M., and reached the anxiously waiting customer sooner than he had dared to hope for it.

★ ★

The loss of the *Oklahoma* should raise an important question among marine architects, ship builders, and ship owners concerning the present practice for fitting bulkheads in a ship. The *Oklahoma* appeared to break in two along the line of rivets for a bulkhead. The catastrophe

seems to point to a miscalculated factor of safety. The error, if error it be, is shared by all builders and is laid down in the rules by Lloyds, the Bureau Veritas, etc. In putting a bulkhead in a ship the practice is to bore rivet holes along the line of a plane section of the hull. Does this punching a direct line of holes around the girth of a ship weaken the structure for breaking strains more than has been calculated? The yard where the *Oklahoma* was built does excellent work. If the vessel was built according to the rules, the practice in question may explain other disasters at sea of which there are no records.

★ ★

A remarkable test has been reported in the *New York Sun* which illustrates the new era for marine power upon which the world is entering. The *Idealis*, a yacht equipped with Diesel engines, was put to a test on the Hudson River. The yacht is 84 feet long, 14 feet beam, 150 horse-power engines. The test was conducted by Henry B. Sutphen for the benefit of some naval engineers and architects. The start was made from the Columbia Yacht Club, at the foot of 86th Street, and the yacht ran up the Hudson to Croton Point and back, a distance of 65 miles. The run was made in 5 hours. The motors were tested in every way, starting, stopping, and reversing at high and low speed. Only 35 gallons of fuel oil was used. The fuel oil cost $3\frac{1}{4}$ cents per gallon. Thus the cost of fuel for the entire run of 65 miles was \$1.14 or $1\frac{3}{4}$ cents per mile.

The comparison even with gasoline motors is astonishing for those who are not well informed about the Diesel oil

TEXACO STAR

engine. If the *Idealis* had gasoline engines, she would have used about 65 gallons of gasoline for the 65 mile trip. The cost of fuel for steam engines would seem absurdly beyond comparison, even if oil were the fuel for the steam boilers. With coal as the fuel, speaking broadly, the cost of handling and firing the coal under the boilers for the labor alone is in excess of the entire fuel cost for a Diesel engine doing the same work. Finally, the residue of crude oil after gasoline and kerosene have been taken out, is no less suitable and efficient in a Diesel engine than oil from which those valuable distillates have not been taken. Here is evident a very important means for the conservation of natural resources.

Why is it that the managers of industrial enterprises in America have lagged so far behind Europe in taking advantage of a great fundamental improvement in prime movers? This question was answered by Rudolf Diesel himself, the inventor, Doctor of Engineering and of the Technical Sciences, University of Munich, Director *Verein deutscher Ingenieure*, etc., in his lecture before various societies in this country in 1912. That lecture by Dr. Diesel concludes as follows:

Before concluding his lecture the author desires to touch a question which has been put to him by the Secretary of the United States Navy, to whom he paid his first visit when coming to this country and which has been repeated to him nearly every day since he left the pier at Hoboken: Why are we in America so far behind Europe in the development of this new prime mover, which in fact is no more new to-day?

To answer this question the author must emphatically state that the Diesel engines built in this country, after having passed the necessary manufacturing apprenticeship more than ten years ago, have been and are quite as good as the European machines. So the question is not a technical one, but merely a commercial one, or even more one of the general economical conditions in this country. The author does not know the United States sufficiently to judge these conditions on his own behalf, but he has tried to find out, in his conversations with many prominent engineers, and the following is what he could learn:

First.—Coal is much cheaper than in Europe, and, therefore, people are more wasteful with it; while the leading idea in Europe is always the economy in operating cost, the leading idea in America is economy in first cost. The word efficiency, which is the base of every contract in Europe, seems to be unknown to a vast proportion in this country. Of course, not to engineers, but to business men and to purchasers of engines.

Second.—Steam engines are much cheaper in America than in Europe, but the Diesel engine is not and will not be a cheap engine; it aims to be

the best engine and must be constructed of the very highest class of material, with the best tools and by the most skilled workmen; this makes it difficult for it to compete when such ideas prevail.

Third.—Another general reason seems to be, in very many cases, the lack of capital of the prospective purchaser, and also, the higher rate of capital interest prevailing in the American money market.

Fourth.—A further reason is this: That in the last few decades the general business profits have been so big, that people did not care for the most economical methods of production and for the strictest economy in the fuel bill, as well as other expenses,—the ruling object having been to manufacture quickly and in quantities, without much regard to the cost.

All the conditions the author has alluded to seem to be changing rapidly now; this terribly wasteful performance begins to be realized, the competition has become more keen, and a conservation of natural resources is striven for more than ever before. If this is true, the high-class engines with the highest efficiency will begin on this side of the ocean to have the same importance as abroad.

★ ★

A recent issue of *International Marine Engineering* calls attention to extensive investigation covering nearly all the large motor ships in service, reported in *The Motor Ship and Motor Boat*. The facts show in general a very satisfactory operation of oil-engine driven ships. The large Diesel-engined ships, in particular, are performing, it is stated, up to expectations and "for the most part with uninterrupted and conspicuous success."

★ ★

A small but striking illustration of the high cost of red tape is given by the *Saturday Evening Post*:

"An icy snowball smashed through one of the windows of the waiting room of the old depot. That waiting room in winter is none too warm a place, so the agent acted promptly. He wrote to his division superintendent down at Rockville after this fashion:

"If you will give me authority I will have the window fixed tomorrow. The pane was 22 by 36, which is a stock size. I can get it uptown and put it in myself between trains. It is pretty cold in our waiting room just now and I am getting lots of complaints."

"The superintendent did not give him authority—he could not. His own path was as definitely marked as the agent's, and so he merely acknowledged the letter, and passed it on with a formal letter to his general superintendent. From him it went to the general manager, and finally it reached the engineer in charge of bridges and buildings. A week had passed. It was cold in the waiting room, but the engineer of B. and B. took his time and passed the letter through a deputy to a man who with a pocket-rule made a trip to the agent's town and measured the window.

"The agent of the B. and B. department might have bought the window-pane in the village and

TEXACO STAR

then put it in himself, but he could not. The magnificent business engine, of which he was but a small cog, did not permit such shortcuts. Instead he had to return to headquarters, add to the archives a requisition upon the general supply department for a 22-by-36 pane of glass, and spend another whole day returning with the window-glass and inserting it in conformity with the road's established standards.

"When the agent at Middleford recovered from his near attack of pneumonia, he made up a little memorandum:

<i>My Method</i>	
Cost of glass at local store.....	\$0.75
Time for setting.....	.00
Other expenses.....	.00
Total.....	\$0.75

<i>The Road's Method</i>	
Cost of glass to road's supply department...	\$0.50
Two days' time for man from B. and B. department.....	6.00
Expenses—meals, etc.....	2.25
Total.....	\$8.75

"And in this statement he did not include his own lost time or sickroom bills.

"This story may seem incredible, but it is perfectly true, and is just one instance of the high cost of red tape."

Cast-iron regulations concerning purchasing departments waste the resources and hamper the work of many industrial organizations and large enterprises of all sorts. In some cases, for instance, a Purchasing Department may buy engines for power plants in the same spirit that it buys coal or lead pencils. The ordinary purchasing agent thinks mainly of the first cost; he considers quality, but only as compared with quite similar articles; he may be wholly incompetent to judge the economy and efficiency of different types of engines. The manager and staff of a manufacturing plant ought to choose its engines, and decide upon the means of transmitting power and all questions involving judgments of technical matters.

★ ★

A suggestive application of moving pictures has been made by the Central Railroad of Georgia in an effort to diminish the waste of fuel. The views show fire boxes properly and improperly fired, correct and faulty methods of handling the scoop, etc. Evidently this idea might be extended to the teaching of economical methods for various operations in other industries.

★ ★

A story is told of a passerby who stopped to look at the busy scene of work on a big building that was going up. Curiosity led him to ask one of the workmen what

he was doing. "I am working for three dollars a day," the man answered. To the same question a second workman replied, "I am carrying mortar." A third time he asked the question, and the third man, straightening up and breathing deep, replied, "I am helping to build this great structure."

The story needs no comment as to the differences of heart and mind exposed by the workmen. But the added thought is pertinent that some man or group of men had designed the building and planned its future uses and had commanded the confidence in their skill and reliability required to induce men to put hard won capital into the enterprise. All this is necessary before there can be a great structure of any sort. And it is by understanding and appreciating the many sides of such undertakings that a man may enjoy best his present part in them, or may fit himself to take larger and larger parts.

★ ★

If listening to advocates of opposing sides of a question be a good way to find the truth of the matter, two recent books afford an opportunity to learn the truth about the Philippines: Blount's *American Occupation of the Philippines*, and Chamberlin's *The Philippine Problem*. Another very timely book is Bingham's *The Monroe Doctrine*, Yale University Press.

EFFICIENCYGRAMS

He who is to win the noblest successes in the world of affairs must continually educate himself for larger grasp of principle, and broader grasp of conditions.—*Hamilton Wright Mabie*.

A man's mind may be likened to a garden, which may be intelligently cultivated, or allowed to run wild; but whether cultivated or neglected, it must, and will bring forth. If no useful seeds are put into it, then an abundance of useless weed-seeds will fall therein, and will continue to produce their kind.—*James Allen*.

High standards and purposes protect from many temptations that beset the aimless; surplus vitality goes out in vigorous thinking and energetic work. There is profound truth in Tennyson's reason for Sir Galahad's prowess:

"My strength is as the strength of ten
Because my heart is pure."

TEXACO STAR



Trinidad, British West Indies: The Texas Company's Sailing Vessel *Fooling Suey* Discharging Case Oil Into Lighters.

TEXACO STAR



Amoy, China: Coolies Carrying Cases, Just Discharged, Into The Texas Company's Warehouse.

FOREIGN TRADE*

J. R. MIGLIETTA,
Manager of the Export Department

The export market for American petroleum products is a most important one, in fact its preservation and extension is vital to the American petroleum industry and to the growth and prosperity of The Texas Company.

To get an entry in foreign markets for American manufactured products is a difficult proposition, and the result is apt to be unsatisfactory unless the business is sufficient in volume to warrant a considerable expenditure of time and money. Even then immediate satisfactory returns cannot be expected, and only a broad and far-seeing management, content for the time being to lay a sound and solid foundation, will be in a position to reap the benefits at a later time. And all of this is ultimately dependent on the products to be offered, always bearing out and ab-

solutely confirming any representations which may have been made in regard to them.

Before The Texas Company attempted to enter the foreign market some of their best men, trained along special lines, spent several years in canvassing the various fields in order to determine which were the desirable markets, what these markets required, what competition had to be met and what policy it was necessary to pursue, not only in order to secure an entry for Texaco petroleum products, but to insure their permanent presence after having gained a foothold.

A great deal has been accomplished along these lines, and, while more remains to be done, The Texas Company today is recognized as good for its contract in whatever market its products are offered, as fur-

*A continuation of Mr. Miglietta's article, entitled Export Department Organization, will follow in the March issue.



TEXACO STAR

Some of the Native Finery at Durban, South Africa. Note the Rickshaw Men.

TEXACO STAR



Cape Town, South Africa; The Texas Company's Warehouse. Kerosene Oil is Known as "Paraffine" in South Africa.

nishing products second to none and always able and ready to meet the widely varying requirements, or what might even be termed idiosyncrasies, of the trade.

It is a fallacy commonly believed, and acted upon, that if the quality and price of the products which an American manufacturer and exporter has to offer are suited to the American trade, they will sell elsewhere equally as well. Adjustment to local ideas, suavity and tact on the part of the American representative, recognition of the credit system prevailing in each particular country, and ability to communicate with the customers in their own language are important factors; but beyond that there is required a broad adaptability to conditions which often necessitate concessions on secondary points in order to gain the essential. Insufficient investigation of any particular market on the part of the manufacturer and exporter (resulting in shipping unmarketable or unsuitable grades of oil), and lack of confidence among buyers as to the exporter's responsibility or ability to compete, have likewise a bearing on the probability of success when a new field is entered.

Broadly speaking, of products exported

in great volume only those manufactured by concerns who have spent their time and money, and who went to the trouble of making a personal canvass of each and every country which they propose to cover, have been successful in gaining an entrance in foreign markets and holding their own against all comers. Such concerns as the Standard Oil Company, the United States Steel Corporation, the National Harvester Company, and the Remington Typewriter Company, or, let us say, the leaders in the principal industries, have gained success by just this process of investigation in each market by their own special men, which resulted in a thorough understanding of the conditions in each country. While such a course is not practicable or possible for a concern which has not a considerable volume to market, at the same time it is the only intelligent way in which the export business can be handled.

Large business concerns are often decried as being undesirable because of their inherent great power. No one, however, can successfully maintain that the old way of doing business, either individually or through co-partnerships or small corporations, is practicable any longer. No

TEXACO STAR

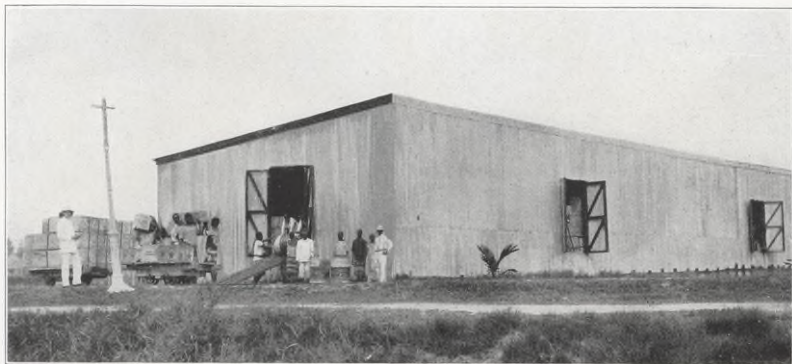


After Paying Duty—Going to the Town Store: Dar-es-Salaam, German East Africa.



Carrying Light Into "Darkest Africa"—Pangani, German East Africa.

TEXACO STAR



Beira, Portuguese East Africa: Kerosene Warehouse. The lamppost looks somewhat foreign—not so “Texaco.”

up-to-date business concern objects to intelligent regulation and supervision; but the large industries, particularly those working for world markets, need more than that. They need a friendly attitude of mind and active support on the part of both State and Federal authorities, as without such assistance, or—what would be worse—if unnecessarily harassed, development will be checked, enterprise discouraged, and foreign competitors correspondingly benefited. A small concern has little chance to gain access to a foreign market, to say nothing about competing successfully and permanently with the giant foreign corporations, particularly English and German, who can always count upon the support of their respective Governments.

It is a waste of time to rely on Consular Reports, however newsy and literary they may be, or to accept or act on the advice of men who are not specialists in the particular branch of business for which an entry is sought.

The direct exploitation of the foreign markets being expensive and time consuming, it was impossible for The Texas Company to follow this course until it grew to a size and strength that enabled it to formulate a broad policy as regards its foreign business, which it has since carried out. As a result of this, The Texas Company has now built up a foreign trade which among American petroleum concerns is second only to that of the Standard Oil Company. Moreover, it is of such a character that it is not easily



Bombay, India: The Texas Company's Warehouse

TEXACO STAR



A Typical Delivery Scene—Unloading from Native Boat—Manila, Philippine Islands.

disturbed, as The Texas Company are distributing, either through their own stations or through agents under their full control, directly to the trade and consumers.

Our own men and Texaco products now practically cover the globe. When an American mining engineer enters the Transvaal, among the things which remind him of home are the Texaco Star and Texaco petroleum products which he sees about him. The traveler visiting the West Indies is reminded of American enterprise by the same familiar trade-mark. American buyers of Philippine hemp are likely, upon entering Manila, to see lighters going about the bay stacked high with The Texas Company's products, and similar impressions are experienced on a trip around the world, whether in the treaty ports of China or in Australia, in South America or on the West and East Coasts of Africa, and in many places still further removed from the usual route of travel.

COMPETITION

In order that our readers may get a better understanding of the extent of the foreign petroleum business, and the relative position The Texas Company occupies

in the world's trade, I will endeavor to give briefly some particulars in regard to the competition, as well as the production of oil, in those foreign countries which contribute to the supply of the world's markets.

At the present time the interests figuring most prominently as foreign distributors are:

- 1 Standard Oil Companies
- 2 Royal Dutch-Shell Companies
- 3 The Texas Company

Other American, as well as foreign concerns, are engaged in the supply and distribution of petroleum products in specific markets. Some of them, notably the Gulf Refining Company, European Petroleum Union, and others are very important in themselves and in their respective spheres, but their limited radius of action does not place them in the classification which we are here considering.

As world-wide factors in the trade the Standard Oil Companies are, of course, the most important, being established in every country through the ramifications of the following concerns:

- Standard Oil Company of New Jersey
- Standard Oil Company of New York

TEXACO STAR



Manila, Philippine Islands: The Carabao is Doing the Hauling,—a Living Example of the Appropriateness of Our Trade-mark "Carabao."

Anglo-American Oil Company
Vacuum Oil Company
Colonial Oil Company

Each of these companies operates directly or indirectly in specific districts. It is an interesting fact that through the Standard Oil Company's ramifications in the European producing fields they are actually figuring as distributors even in those countries which are supplied by local production, while, owing to the superior quality of American illuminating oil as compared with foreign products, they are able to import and distribute American kerosene even in the Dutch East Indies, and are successfully competing for a fair share of the trade in the neighboring markets which are otherwise largely supplied with oils exported from the Dutch East Indies by the Royal Dutch-Shell Companies.

The Royal Dutch-Shell Group has established marketing organizations in every important country where low grade refined oil is sold, and this grade has been until lately all they were able to produce or obtain. In the hope of getting supplies which would enable them to meet the requirements of the more exacting mar-

kets, the Royal Dutch-Shell Group, as a preliminary step, have lately acquired considerable producing property in the Mid-Continent fields. Their companies have been the principal suppliers of gasoline in the European countries, and until lately this product was distributed by local concerns acting for them in the capacity of agents. No illuminating oil actually produced by any companies controlled by this Group has as yet been shipped to European markets, and the absence of the Royal Dutch-Shell Group is also noticeable in the West Indies, Central and South America, and on the Northwest and West Coast of Africa.

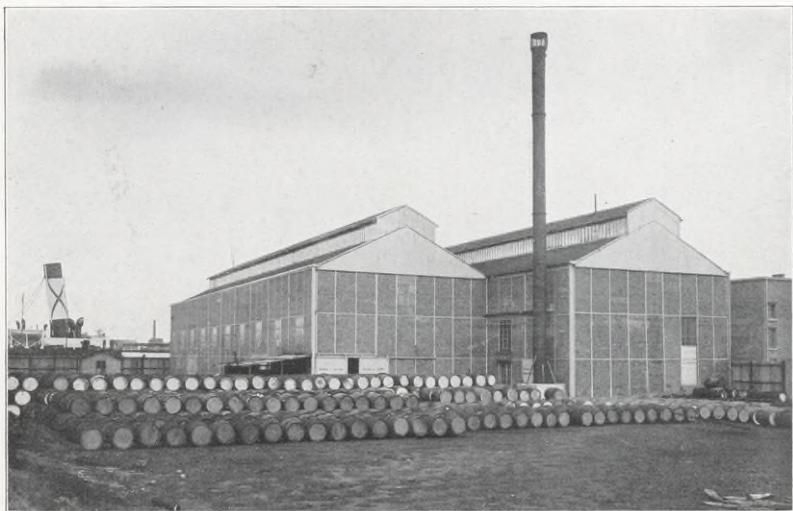
As to The Texas Company, the markets where its oil is not distributed, directly or indirectly, are those where only low grade oil is salable, or where the competition is with oil imported from the Dutch East Indies or California.

The accompanying map will give a good idea as to the extent of the foreign markets at present supplied by The Texas Company.

PRODUCTION—STOCKS—SHIPMENTS

The continued expansion in the consumption of petroleum products suggests

TEXACO STAR



Antwerp, Belgium: Lubricating Oil Compounding Plant.

a careful investigation of the present position of the various producing fields, both foreign and domestic, and what the prospects are of securing new supplies to meet the increasing demand for petroleum products. A great deal of activity has been witnessed during the past year in an endeavor to open up new territories and, generally speaking, these efforts have been quite successful.

Taking the various countries in the order of their producing importance, it is found that in America the incentive given to the operators because of the high prices paid for crude oil stimulated "wildcatting" in new regions and promoted the extension of the older fields. For the year 1912 this activity was particularly marked in the high grade fields east of the Mississippi. In the Pennsylvania fields new operations may have assisted in maintaining the production for the time being, but they cannot be considered as having any longer a lasting effect on crude supplies. The output of the Mid-Continent fields and the Gulf fields for 1912 remained about the same as in the previous year, while California for the same period showed a marked increase.

Approximate statistics, just issued, covering the production in America for 1913, show an increase over the production for 1912 in excess of 20,000,000 barrels. California and Oklahoma show the most prominent increases, each with over 10,000,000 barrels as compared with the previous year. Texas, Louisiana, and Wyoming have also shown some increase. The other producing States generally show a decline, particularly marked in Illinois.

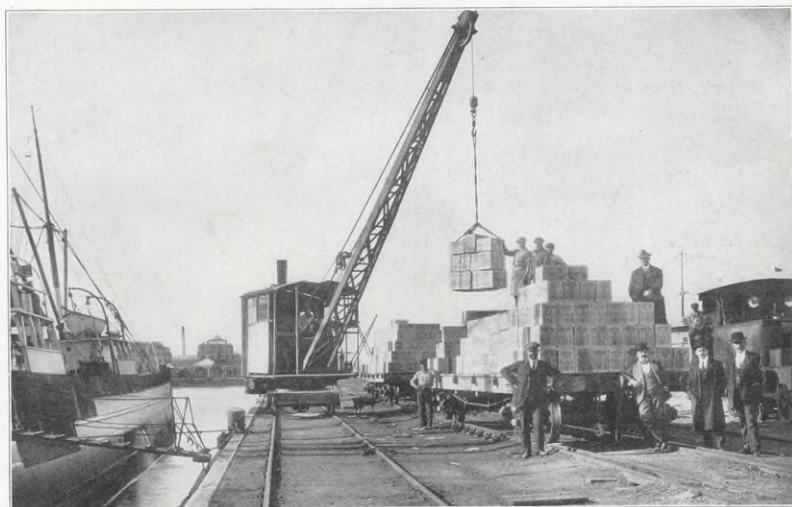
The production in Russia has shown a small increase in 1912 over the previous year, although it is considerably below the production for 1910. New territory has been opened up in new regions, which was expected to contribute very largely to the output during the year 1913.

Rumania, Mexico, British India—or Burma, and Japan, all show a greater output of crude in 1912, while Austria-Hungary and the East Indies show a marked decline.

The total for all other countries shows an increase during the same period. These miscellaneous countries include Peru, Argentine, Bolivia, Venezuela, Trinidad, Australia, New Zealand, Italy, China, Egypt, Mesopotamia, and Africa.

The following table gives the production

TEXACO STAR



La Plata, Argentine: Discharging a Cargo of The Texas Company's Products.

of every country for 1911 and 1912, in barrels of 42 gallons, and shows the respective percentage of each producing district. Advance figures relative to the production in America for 1913 have already been mentioned, but no statistics are as yet available for foreign producing countries.

	1911 Barrels	Per Cent	1912 Barrels	Per Cent
<i>United States</i>				
Appalachian.....	23,749,832		26,328,516	
Lima-Indiana.....	6,231,164		4,925,906	
Illinois.....	31,317,038		28,601,308	
Mid-Continent.....	65,917,788		65,473,345	
Gulf.....	11,677,362		8,545,018	
California.....	81,134,391		86,450,767	
Other Fields.....	358,839		1,778,358	
Total.....	220,386,614	63.78	222,113,218	63.32
<i>Russia</i>				
Baku.....	52,138,095		51,536,615	
Grosny.....	9,026,361		7,851,140	
Maikop.....	952,453		1,101,442	
Other Fields.....	4,066,782		7,527,011	
Total.....	66,183,691	19.17	68,019,208	19.38
<i>Roumania.....</i>	11,101,878	3.21	12,991,913	3.73
<i>Austria-Hungary</i>				
Borslaw.....	1,423,369		1,225,980	
Tustanowice.....	7,947,839		6,158,232	
Other Fields.....	1,114,527		1,150,961	
Total.....	10,485,726	3.03	8,535,173	2.46
<i>Dutch East Indies</i>				
Borneo.....	5,677,609		4,680,743	
Java.....	1,199,902		1,350,075	
Sumatra.....	5,295,438		4,814,806	
Total.....	12,172,949	3.52	10,845,624	3.12

<i>Mexico.....</i>	14,051,643	4.07	16,558,215	4.73
<i>India</i>				
Burmah.....	6,349,274		7,009,549	
Bengal; Assam.....	101,889		107,096	
Punjab.....	40		27	
Total.....	6,451,203	1.87	7,116,672	2.03
<i>Japan.....</i>	1,658,903	.48	1,280,809	.37
<i>Germany.....</i>	1,015,992	.30	995,764	.29
<i>Italy.....</i>	74,709		86,286	
<i>Canada.....</i>	291,096		243,614	
<i>Peru.....</i>	1,398,036		1,611,902	
<i>Egypt.....</i>				
<i>Mesopotamia.....</i>	200,000		500,000	
<i>Argentina.....</i>				
<i>Trinidad.....</i>				
Total.....	1,963,841	.57	2,441,802	.57
Grand Total ...	345,472,440	100.00	350,898,398	100.00

The foregoing table shows a net increase of about 5,500,000 barrels in the production of 1912 over that of 1911. There are, however, two important considerations which alter these apparent results very materially when it comes to the question of availability of new supplies to meet the increasing consumption of petroleum products. The first of these considerations is the geographical position of the fields where the increased production is notable, and, second, the proportion of refined products to be obtained from such crude oil supplies. In the United States the oil produced in the Eastern, Mid-

TEXACO STAR



[illegible]

ND
ing Stations
omingly

Products are being Marketed

AUSTRALIA

1	Alaska	27	Idaho	41	Minnesota	55	South Dakota
2	Alaska	28	Illinois	42	Missouri	56	Tennessee
3	Alaska	29	Indiana	43	Montana	57	Texas
4	Alaska	30	Iowa	44	Nebraska	58	Utah
5	Alaska	31	Kansas	45	Nevada	59	Vermont
6	Alaska	32	Kentucky	46	New Hampshire	60	Virginia
7	Alaska	33	Louisiana	47	New Jersey	61	Washington
8	Alaska	34	Maine	48	New Mexico	62	West Virginia
9	Alaska	35	Massachusetts	49	New York	63	Wisconsin
10	Alaska	36	Michigan	50	North Carolina	64	Wyoming
11	Alaska	37	Minnesota	51	Ohio	65	
12	Alaska	38	Mississippi	52	Oklahoma	66	
13	Alaska	39	Montana	53	Oregon	67	
14	Alaska	40	Nebraska	54	Pennsylvania	68	
15	Alaska	41	Nevada	55	Rhode Island	69	
16	Alaska	42	New Hampshire	56	South Carolina	70	
17	Alaska	43	New Jersey	57	South Dakota	71	
18	Alaska	44	New Mexico	58	Tennessee	72	
19	Alaska	45	New York	59	Texas	73	
20	Alaska	46	North Carolina	60	Utah	74	
21	Alaska	47	Ohio	61	Vermont	75	
22	Alaska	48	Oklahoma	62	Washington	76	
23	Alaska	49	Oregon	63	West Virginia	77	
24	Alaska	50	Pennsylvania	64	Wisconsin	78	
25	Alaska	51	Rhode Island	65	Wyoming	79	
26	Alaska	52	South Carolina	66		80	
27	Alaska	53	South Dakota	67			
28	Alaska	54	Tennessee	68			
29	Alaska	55	Texas	69			
30	Alaska	56	Utah	70			
31	Alaska	57	Vermont	71			
32	Alaska	58	Washington	72			
33	Alaska	59	West Virginia	73			
34	Alaska	60	Wisconsin	74			
35	Alaska	61	Wyoming	75			
36	Alaska	62		76			
37	Alaska	63		77			
38	Alaska	64		78			
39	Alaska	65		79			
40	Alaska	66		80			

TEXACO STAR

Continent, and Southern fields is or has been nearly all available for shipment in manufactured form to all the markets of the world. California's light crude oil production, or its derivatives, have, however, chiefly supplied the local or Pacific Coast requirements for kerosene, gasoline, and fuel oil, and beyond that, the needs of the West Coast of South America and the Orient. The character of the oil is such as to exclude its competition with the higher grades to be obtained from Eastern and Mid-Continent fields, the geographical location of the oil fields also confining it to the Orient or Far Eastern trade. The bulk of the California production is heavy oil, yielding only a small percentage of naphtha and illuminating oil, and a large proportion of residual oils; and for this reason most of the heavy crude is marketed for fuel without being treated.

As to the quality of the oil produced in the United States, exclusive of California, the Eastern and the Mid-Continent fields, including Caddo in Louisiana and those recently developed in Northern Texas, being of paraffine base, yield all of the products consumed in the world's markets, while the oil produced in the Gulf Coastal Fields is either sold as fuel, or, in the case of some crudes which are specially adapted, is used in the manufacture of high grade lubricating oils.

As regards the United States, therefore, it would seem that while the production shows a very considerable increase for the year 1912, it was not exactly of the kind or in the right place to meet the increased demand, and, so far as the advance figures for 1913 show, the net excess production consisted more largely of heavy oils and showed a lesser increase of the lighter gravity oils.

In so far as Russia is concerned, the quality of the oil produced in the various districts does not differ very much, or at least not so much as in the United States. It can be said that the newly developed territories such as Grosny, Maikop, Tscheleken, Ferghana, and the Ural are producing an oil yielding a larger percentage of light products than the oil produced in the older Baku District. The newly developed territory is also equally as well located as the Baku District for shipments into Russia or for export.

In Rumania and Austria-Hungary the production for the year 1912, taken as a whole, has not varied much as compared with 1911. The products of both countries can only be distributed in the world's markets at competitive freight rates, and this restricts them largely to markets in near-by countries. The quality of the refined oil manufactured does not class with the American or even with some of the Russian products.

In the Dutch East Indies the production for the year 1912 has fallen off. The oil produced in Sumatra and Java differs considerably from that produced in Borneo, the latter being largely a fuel oil, while the fields of the former countries yield a crude oil with a high percentage of naphtha. As already stated, this product is shipped principally to the important European markets and, lately, to the Pacific Coast of North America.

In Mexico the production of crude oil has made great strides during the past few years, but the greater proportion of it up to the present has been of such quality as will hardly make it available for refinery use, and it will no doubt find its chief outlet in certain fuel oil trade, where flash, sulphur percentage, and viscosity are of lesser moment.

The statements set out above are confirmed by the fact that during the year 1912 the refineries in the United States have drawn heavily on stocks which on December 31, 1911, amounted to 137,232,998 barrels, and on December 31, 1912, to 122,869,702 barrels, the decrease being most notable in stocks of light oils from the Appalachian, Lima-Indiana, Illinois, and Mid-Continent fields. On the other hand, there has been a considerable increase in stocks of heavy oils, particularly in California.

The stocks of crude and finished products in Russia and Rumania, as of December 31, 1912, remained about the same as for the previous year, while in Austria-Hungary they were decreased by about 5,000,000 barrels or, roughly, 50 per cent.

The exports from the United States of all petroleum products for the year 1912 amounted to 47,253,365 barrels, as against 45,475,273 barrels for the previous year, while approximate figures as to the exports from other countries for the same periods are as follows:

TEXACO STAR



Storing Texaco Products at La Plata, Argentine.

	1911	1912
Russia.....	4,367,986	4,161,229
Rumania.....	5,052,141	6,564,147
Austria-Hungary.....	3,319,663	5,021,219
Dutch East Indies.....	5,031,921	Unknown
Mexico (crude).....	806,916	6,675,768

TRADE ROUTES

It will be interesting to observe to what extent the opening of the Panama Canal is likely to influence foreign trade in petroleum products, particularly out of

the Gulf of Mexico. The markets which will be brought much closer to The Texas Company's principal export terminal are the Australian and Far Eastern Countries, which will be about 500 miles nearer to Port Arthur than to New York. The following table shows the comparative distances from New York and Port Arthur to various important points by the present steamship routes and via the Panama Canal.

TO:	FROM:	PRESENT ROUTE		VIA PANAMA CANAL	
		New York (Nau. Miles)	Pt. Arthur (Nau. Miles)	New York (Nau. Miles)	Pt. Arthur (Nau. Miles)
<i>Australia and New Zealand:</i>					
Sydney (via Straits Magellan).....		12,779	13,200	9,691	9,113
Wellington (via Straits Magellan).....		11,344	11,966	8,522	8,044
<i>Philippine Islands:</i>					
Manila (via Good Hope).....		13,581	13,903	11,540	11,062
<i>China:</i>					
Shanghai (via Good Hope).....		14,427	15,277	10,573	10,095
<i>Japan:</i>					
Yokohama (via Good Hope).....		15,099	16,152	9,699	9,221
<i>Strait Settlements:</i>					
Singapore (via Good Hope).....		12,409	13,307	12,522	12,044
<i>West Coast South America:</i>					
Chili (Valparaiso).....		8,380	8,964	4,633	4,155
From New York to Colon.....			1,974	nautical miles.	
From Port Arthur to Colon.....			1,496	nautical miles.	

TEXACO STAR

TEXACO MOTOR OILS

DR. G. W. GRAY

Chairman of the Refining Committee.

The phenomenal growth of the automobile industry has increased enormously the demand for special lubricating oils for internal combustion engines.

These oils are generally called "Motor Oils" when used for lubricating the engine of an automobile, motor truck, or motor boat, but when used for lubricating other classes of internal combustion engines are commonly spoken of as "Gas Engine Oils."

It can be laid down as a general rule that all "Motor Oils" are good gas engine oils, but it cannot be said that all gas engine oils are good motor oils.

Before entering into a discussion as to what constitutes a good motor oil, it will be necessary to describe the method of making engine lubricating oils.

We have in the United States three general classes of crude oil:

- 1st Paraffine base crude.
- 2nd Semi-paraffine base crude.
- 3rd Asphalt base crude.

The first two classes of crude are refined in the same manner, and Mr. R. C. Holmes has described in the November issue, Pages 6 and 7, how the Pressed Distillate is obtained from classes 1 and 2 and how the Lubricating Distillate is obtained from class 3.

RED OILS. From the Pressed Distillate, a number of motor oils are made by reducing the distillate with fire heat and steam to the required viscosity. The reduced oil is then treated and washed thoroughly with water to remove all impurities. Nearly all the oils made in this manner are red in color. They will also show a high fixed carbon. The gravity of these oils is, as a rule, lighter than 23.5 deg. Beaume.

Other motor oils are made from the Pressed Distillate by reducing with fire and steam to proper viscosity and then filtering through Fuller's Earth or Bone Black. These oils will vary from red to pale in color. They will be free from ash and the fixed carbon will be practically the same as in the treated oils. Oils made by this method will rarely exceed 300

viscosity, and in order to obtain higher viscosity, it will be necessary to compound these oils with other filtered or unfiltered cylinder stocks.

Nearly all oils made from paraffine base crude have a pour test higher than 30 deg. Fahr., and on account of this high cold test, are unsatisfactory for winter use in cold climates. There are, however, a few oils made which have been pressed at a very low temperature and those have a cold test considerably below 30 deg. Fahr.

PALE OILS. These are sometimes made by filtering the Red Oils up to pale color. They are also made by re-distilling the Red Oils by means of fire and steam and then reducing the distillate to the proper viscosity. These oils are then either filtered through Fuller's Earth or Bone Black to get color, or they may be treated and then thoroughly washed with water. In order to improve the color, they may also be later filtered through Fuller's Earth or Bone Black. The oils made in this manner usually show less carbon than Red Oils of the same viscosity.

The methods described above are the ones usually pursued in the manufacture of paraffine base oils. As our motto has always been "High Quality," we are not satisfied to make our motor oils by the above mentioned methods.

In making motor oils from asphalt base crudes, the distillates coming from these crudes are re-distilled never less than twice, and, in many instances three times, and the distillates are carefully separated into oils having different viscosities.

By this procedure, we obtain oils of comparatively narrow range and oils much better for motor lubrication than would be obtained if we were to make the oils by mixing a number of different cuts together. Even the extra heavy oils are, as nearly as possible, free from residue.

All of these oils are treated to remove the unsaturated hydro-carbons, as it is the unsaturated hydro-carbons which have a tendency to oxidize. The oils are thoroughly washed with water and filtered

TEXACO STAR

through large filters containing Fuller's Earth.

These filters are so constructed that they will hold from 40,000 to 80,000 pounds of Fuller's Earth. The process of filtering will remove all traces of inorganic matter from the oil. It will also remove all oxidized products, and, as a result of the removal of these products, the oils will be of pale color.

This process is the only one by which extra high grade motor oils can be produced. All our motor oils are made strictly from an asphalt base crude for the reason that we have found by long experience and many tests that an asphalt base crude produces the highest quality of motor oils. Later on in this article, I shall give proof as to why this is so.

In making analysis of a motor oil, the following determinations are usually made:

- 1st Flash test
- 2nd Fire test
- 3rd Gravity
- 4th Viscosity
- 5th Color
- 6th Cold test
- 7th Ash
- 8th Distillation
- 9th Fixed carbon

1st-2nd Flash and Fire Tests. These tests are considered by some to be very important. Some persons think that by getting an oil of high flash and fire test they are obtaining a superior oil. Flash or Fire Test is no criterion as to quality. The Flash of an oil will vary depending on the crude from which it is made. The Flash and Fire Test should be sufficiently high so that there is no danger from the use of the oil. If the oils have been properly made, the flash will vary from 375 to 430 deg. Fahr. on oils made from paraffine base crude, and 320 to 375 deg. Fahr. on oils made from asphalt base crude. Motor Oils made from asphalt base crude run about 50 degrees lower flash than the same grade of oil made from paraffine base crude.

Experiments have shown that the lubricating oil in a crank case of an automobile is nearly always lower in flash than the oil which was introduced. This is due to the leakage of gasoline past the rings during the compression stroke. Gasoline thus becomes mixed with the oil in the crank case.

In a recent comparative test between

Texaco Motor Oil and a paraffine base oil in a new motor, the flash was determined on each oil before making a nine-hour run and after completion of the run with the following results:

	Before test: Flash	After 9 hours' run: Flash
Paraffine base oil.....	420	320
Texaco Motor Oil.....	350	350

This test was made on a high viscosity oil.

In another case, where a lower viscosity oil was used, the following results were obtained:

	Before test: Flash	After 9 hours' run: Flash
Paraffine base oil.....	395	220
Texaco Motor Oil.....	320	230

In the first case, the paraffine base oil dropped 100 degrees in flash, whereas Texaco Motor Oil did not drop at all.

In the second test, the paraffine base oil dropped 175 degrees in flash, whereas Texaco Motor Oil dropped only 90 degrees or approximately half as much.

From this one can see that the oil in the crank case is nearly always much lower in flash than the oil put in. The fact that the oil in the crank case is nearly always from 50 to 175 degrees lower in flash than the unused oil, proves that high flash or high fire test is not an essential quality of a motor oil.

3rd Gravity. This, by itself, means nothing, but taken in connection with viscosity, only gives information as to the crude from which the oil has been manufactured.

4th Viscosity. This is one of the most important tests and is made by means of the Saybolt Universal Viscosimeter. The determinations are usually made at 100 deg. Fahr. and sometimes at 130 deg. Fahr. and 210 deg. Fahr.

The viscosity of the oil used should be such as to perfectly lubricate the walls of the cylinder, seal the rings and prevent the escape of the explosive mixture past the piston rings. If the viscosity of the oil is too high, then there is an increased absorption of power in turning over the motor.

We have shown under the subject of "Flash" that gasoline will work past the rings and affect the flash. Whenever the

TEXACO STAR

flash is affected, the viscosity is also affected to a greater or lesser extent.

In comparative shop tests, it has been repeatedly shown that the viscosity of Texaco Motor Oils is less affected than are paraffine base oils. Below are appended the results of a very recent test:

	Paraffine Base Oil	Texaco Motor Oil
Before use.....	295 viscosity at 100 deg. Fahr.	375 viscosity at 100 deg. Fahr.
After use.....	210 viscosity at 100 deg. Fahr.	335 viscosity at 100 deg. Fahr.
Change in viscosity..	85 points	40 points
Change in percent..	28.8 per cent	10.6 per cent

It will be noted in this case that there was only a drop of 10.6 per cent in the viscosity of the Texaco Motor Oil, while the paraffine base oil dropped 28.8 per cent. This shows that the Texaco Motor Oil made a much better gas seal between the rings and prevented the compressed gasoline getting beyond the explosion chamber and contaminating the lubricating oil in the crank case.

Road tests have been made repeatedly and the oil in the crank case has been found to have the same viscosity as before the test, thus showing that the Texaco Motor Oils made a perfect seal and prevented any passage of gasoline into the crank case. In no case, however, have the same results been noted with paraffine base oil.

These tests have indicated the superiority of Texaco Motor Oils of proper viscosity.

5th *Color*. This has been discussed above and need not be taken up at this point.

6th *Cold Test*. Texaco Motor Oils are all of much lower cold test than all paraffine base oils. Texaco Motor Oils are fluid at a temperature of Zero deg. Fahr., whereas, oils made from paraffine base crude, are practically all solid at from 25 to 30 deg. Fahr.

With the Texaco Motor Oil, feed pipes will not be frozen up and it is no trouble to start a motor in the coldest weather as there will be no sticking of the pistons in the cylinders due to the congealing of paraffine wax, this being found only in the paraffine base crude oils and does not occur in Texaco Motor Oils.

7th *Ash*. This should not exist in a motor oil when properly manufactured, and when found, is often due to improper

refining. Ash will practically always occur in oils which have been treated only and have not been subsequently filtered through Fuller's Earth or Bone Black. The Ash from treated oils will consist of carbonate of soda and sulphate of soda and traces of oxide of iron. The carbonate of soda and sulphate of soda are liable to fuse in the cylinders.

This condition can never occur with Texaco Motor Oils as they are always filtered oils and are absolutely free from ash.

8th *Distillation*. This is a test which is made in the laboratory to determine whether the oil will distill without much decomposition and whether it will produce an excessive amount of fixed carbon in the cylinders.

If the distillation of a motor oil is made with fire heat alone, the distillate collected, and a comparison made between the gravity of the distillate and the gravity of the original sample, it will be found that those oils which show the least change in gravity will produce the least carbon in the cylinder.

Motor Oils are a mixture of different hydro-carbons, each hydro-carbon having a definite boiling point, definite viscosity, and definite molecular construction. A hydro-carbon of high boiling point (700 deg. Fahr.) will have a certain viscosity when made from a paraffine base crude, and this hydro-carbon will not distill at atmospheric pressure without decomposition and the formation of carbon.

A hydro-carbon from an asphalt base crude (such as we use to make our Motor Oils), and having the same viscosity as one made from paraffine base crude, will distill at a temperature of at least 100 degrees lower, and the molecular construction of this hydro-carbon is such that it will distill with practically no decomposition and the formation of the barest trace of carbon.

It is due to this molecular structure that the Texaco Motor Oils are so much superior to those made from paraffine base crudes.

9th *Fixed Carbon*. This is the most harmful product which can arise from the use of an unsatisfactory oil. If the oil has not been properly manufactured, or if the proper crude has not been used for the manufacture of the Motor Oil, then

TEXACO STAR

the fixed carbon is liable to be excessive and cause trouble. This carbon will be deposited on the walls and top of the cylinder and cause the motor to run hot and also cause pre-ignition.

Two oils may give practically identical physical tests and one may produce no carbon while the other will produce an excessive quantity. This, of course, is due to the method of manufacture.

If we examine the residue left in a distilling flask after making the distillation test, as outlined in the 7th test, we will find that it varies, depending on the crude used in manufacturing it and also on the method of manufacture. The carbon from a paraffine base crude will be hard and flinty, while the residue from a Texaco Motor Oil will be fine and sooty. The same results will be observed in the cylinder of a motor.

Experiments have shown that motor oils made from paraffine base crude undergo considerable change in the cylinder, with the formation of variable quantities of carbon. The residue (from a paraffine base oil) which accumulates in the cylinder is of a heavy sticky nature and collects the dust readily. As this deposit increases

in the cylinder, it gradually becomes very hard and brittle and acts as an insulator, causing the motor to run very hot. This deposit is removed with great difficulty and often has to be chipped from the walls of the cylinder.

Texaco Motor Oils, made from an asphalt base crude, undergo very little decomposition in the cylinder. Any oil which gets into the cylinder and is not consumed passes out of the exhaust. There is very little carbon formed and this carbon is of a fine and sooty nature and does not absorb the dust. It therefore does not act as an insulator and the motor runs much cooler. On account of the soft condition of this deposit, it can (in nearly all cases) be wiped off the cylinder walls with a piece of waste.

Having explained the different tests to which a motor oil is subjected, I will now give a comparative analysis of a number of different motor oils. Each table will be composed of oils having approximately the same viscosity.

The first table will be composed of oils having a viscosity of about 200 on the Universal Viscosimeter taken at 100 deg. Fahr.

TABLE No. 1: Composed of Oils of About 200 Viscosity.

Sample	1	2	3	4	5
Flash.....	325	400	430	425	380
Fire.....	370	460	490	485	435
Gravity.....	19.7	24.9	30.6	30.8	26.3
Viscosity at 100.....	196	198	204	205	190
Viscosity at 130.....	97	101	104	104	94
Viscosity at 210.....	42	43	43	44	40
Color.....	Pale	Pale	Red	Pale	Dark Pale
Ash.....	None	None	0.0005 per cent	None	0.003
Cold test.....	Minus Zero	Zero	27 deg. Fahr.	30 deg. Fahr.	10 deg. Fahr.
Fixed Carbon.....	0.06 per cent	1.40 per cent	1.73 per cent	0.44 per cent	0.42 per cent
Initial boiling point.....	570	592	435	440	550
Gravity before distillation.....	19.7	24.9	30.6	30.8	26.3
Gravity after distillation.....	20.7	28.9	37.3	36.0	28.5

Sample No. 1 is a Texaco Motor Oil made strictly from an asphalt base crude.

Sample No. 2 is made from Oklahoma crude

Sample No. 3 is made from Pennsylvania crude

Sample No. 4 is made from Pennsylvania crude

Sample No. 5 is made from Mid-continent crude

TABLE No. 2: Composed of Oils of About 300 Viscosity

Sample	1	2	3	4	5
Flash.....	355	425	430	430	495
Fire.....	400	485	490	485	405
Gravity.....	19.0	25.8	27.0	30.7	30.1
Viscosity at 100.....	299	329	307	262	312
Viscosity at 130.....	129	155	150	130	150
Viscosity at 210.....	44	51	49	48	50
Color.....	Pale	Red	Dark Pale	Red	Red
Cold Test.....	Zero	35 deg. Fahr.	35 deg. Fahr.	35 deg. Fahr.	40 deg. Fahr.
Fixed Carbon.....	0.03 per cent	3.94 per cent	0.9 per cent	2.37 per cent	1.01 per cent
Initial boiling point.....	620	525	655	610	572

TEXACO STAR

Gravity before distillation.....	19.0	25.8	27.0	30.7	30.1
Gravity after distillation.....	20.5	32.5	30.2	37.6	33.9

Sample No. 1 is a Texaco Motor Oil made strictly from asphalt base crude.

Sample No. 2 is made from Mid-continent crude

Sample No. 3 is made from Ohio crude

Samples Nos. 4 and 5—are made from Pennsylvania crude.

TABLE No. 3: Composed of High Viscosity Motor Oils

Sample	1	2	3	4
Flash.....	350	400	430	445
Fire.....	415	460	495	510
Gravity.....	18.7	26.6	28.2	29.3
Viscosity at 100.....	750	482	732	725
Viscosity at 130.....	265	197	320	315
Viscosity at 210.....	59	60	76	72
Color.....	Pale	Dark Red	Dark Red	Light Green
Pour Test.....	Zero	40 deg. Fahr.	40 deg. Fahr.	40 deg. Fahr.
Fixed Carbon.....	0.50 per cent	3.0 per cent	3.4 per cent	4.1 per cent
Initial boiling point.....	620	392	392	386
Gravity before distillation.....	18.7	26.6	28.2	29.3
Gravity after distillation.....	21.3	33.5	37.9	35.2

Sample No. 1 is a Texaco Motor Oil made strictly from an asphalt base crude.

Samples Nos. 3 and 4 are made from Pennsylvania crude.

By examining the initial boiling point of the oils given above, it is apparent that Texaco Motor Oil begins to distill not less than 245 deg. Fahr. above its flash point, whereas, all the other oils, being made from paraffine base crudes, show an initial boiling point, in some cases, below the flash point, and in no case, is the difference between the initial boiling point and flash point as great as in oils made from asphalt base crudes.

The reason that the initial boiling point of the paraffine base oils is so much nearer the flash point is due to the fact (as explained under the subject of distillation) that these oils will not distill without decomposition, whereas Texaco Motor Oils, being made strictly from an asphalt base crude oil, do not undergo decomposition on distillation and therefore are not decomposed to produce carbon.

It will also be noted that in Table No. 1 that these oils have approximately the same viscosity, and yet, the gravity varies from 19.7 deg. Beaume to 30.8 deg. Beaume, thus showing that there is absolutely no connection between gravity and viscosity. The same thing is shown in Tables Nos. 2 and 3.

It will be noticed that the gravity of the Texaco Motor Oils, before and after distillation, shows only a slight change. On oils of 200 viscosity the change is 1 degree—on oils of 300 viscosity the change is 1.5 degrees—oils of 750 viscosity, 2.6 degrees, whereas, oils made from paraffine base crudes of the same viscosity will show

a much lighter gravity after distillation and a greater difference between the original gravity and the gravity of the distillate.

These tests show that this change in gravity is an indication as to the amount of carbon which an oil will produce in a cylinder. As a rule, the greater the change in gravity from distillation, the greater amount of carbon will be produced. Texaco Motor Oils have the least change in gravity and will therefore produce the least amount of carbon in the cylinders, and will therefore give the best results in actual use.

It has been shown, not only by laboratory tests but also by practical tests, that Texaco Motor Oils, made from asphalt base crudes, are superior to motor oils made from paraffine base crudes.

Texaco Motor Oils are the best for the following reasons:

- 1st It requires less of this oil to lubricate a motor.
- 2nd It makes a better gas seal and thus increases the power.
- 3rd It produces less carbon in the cylinders and thus allows the engine to run cooler.
- 4th It has the lowest cold test, and therefore the oil will not freeze (chill).
- 5th On account of all of the above, it requires less gasoline to run a motor and thus one obtains increased mileage for a given quantity of gasoline.

TEXACO STAR

BY THE WAY

THE advertising man of the future will not be local. He will have a touch of what Dr. Bucke called "cosmic consciousness." He will see, not this country alone, but the whole world. Even now we find that industrial conditions have forced some men to think international thoughts. They have had to study other races. Business has demanded that they become students.—Thomas Dreier in *Associated Advertising*.

* *

The Maharajah of Mysore is electrifying his province in more than one sense of the word. Literally, telegraph and telephone lines and great hydro-electric power plants are being rapidly developed; also, the Maharajah is reported to be enthusiastic about American products. Mysore, rich in natural resources (30,000 square miles, population 6,000,000), is said to be an especially inviting field for American enterprise.

* *

Epidemic diseases among the horses of South Africa have so diminished the number of horses, that motor wagons are in sharp demand. Agricultural associations are urgently advocating the use of power wagons and tractors for plows and harrows.

* *

Oil-burning locomotives are taking the place of coal burners on the western end of the Canadian Pacific Railway. Forty coal burners have been transformed to oil burners.

* *

A party of Japanese experts have been inspecting the oil fields, including well-drilling and pumping methods, in Texas, Louisiana, and Oklahoma.

* *

In January the Corona Oil Company (Dutch-Shell) No. 5 at Panuco came in, flowing 15,000 barrels, which soon increased to 50,000 barrels a day. The oil is reported 12.7 degrees in gravity by the Beaume scale and free from water. Lack of pipe lines between Panuco and Tampico makes a difficult transportation problem.

* *

The Mexico Petroleum Company's Ebano group of 26 wells located 40 miles west of Tampico, drilled since 1904, have produced 13,500,000 barrels of oil. In the Casino group, 70 miles south

of Tampico, the yield is practically all from their No. 7 well which has produced over 25,000,000 barrels of oil since it was struck in June, 1910. This is the record oil well of the world. Since its flow was controlled and the production secured on September 7, 1910, the output has varied from 20,000 to 25,000 barrels a day, making an average of 22,000 barrels of oil per day to the present time.

It is estimated that this Casino No. 7 well also produced ten billion cubic feet of gas up to April, 1913, all of which was wasted. Since then it has been controlled, a gas line recovery plant installed, and an 8-inch gas line completed, conveying gas from Casino to Tampico on the Gulf coast.

The Penn-Mexican Oil Company, of Pittsburgh, has drilled several good wells in Mexico, the last one being reported as good for 10,000 barrels.

A special from Tampico November 22, says: An oil well with an estimated flow of 50,000 barrels has been brought in by the Mexican Oil Company, an independent concern operating in the Topila district of the Tampico oil fields. Owing to the unsettled state of affairs due to the activities of the constitutionalists in the State of Tamaulipas, the well has been capped until adequate means of transportation for the output can be arranged for.—*Oil and Gas*.

* *

Mr. R. J. Crane, tank wagon driver at Chickasha, Okla., writes as follows:

I have a little suggestion for an ad. You say for us to send them to the Advertising Division, New York office. Not knowing the correct address, I am sending to you. You can send it to them. I am tank wagon driver at Chickasha, Okla. I get the *Texaco Star* every month and think it is the best thing the Company ever got up. I did not really know what kind of a company I was working for till I got the first copy of the *Texaco Star*. I get lots of ideas from the *Star* to help me make sales on my wagon. I wish it a grand success. I am sending a photograph of my team and stake wagon.



The man who says the right thing at the right moment is not much of a talker.—*New York American*.

First Clerk—"How many people work in your office?"

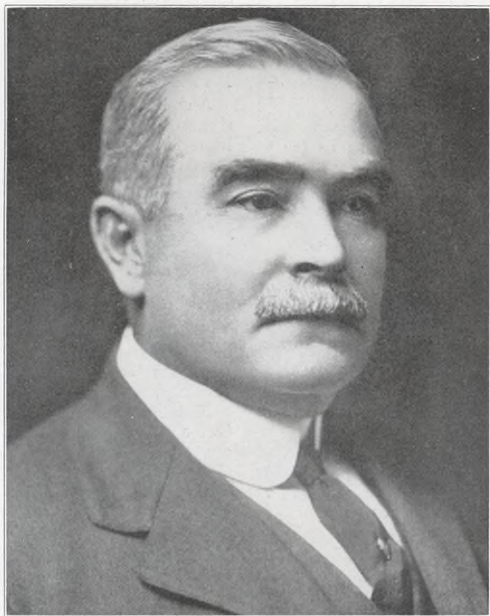
Second Clerk—"Oh, I should say roughly about a third of them."—*London Sketch*.



TEXACO STAR

One hundred and twenty-five pieces of solid sterling silver. The workmanship is exquisite, including monogram on every piece. The dinner set is English repouse work. The salad set is of a different all-engraved pattern. The coffee service, including the silver saucers and the receptacles for coffee and bouillon cups and ramekins, is of a French pattern, the cups being Lenox china. Various accessories, such as trays, vases, candelabra, etc., complete the service.

TEXACO STAR



J. S. CULLINAN

A spontaneous desire to show their esteem for Mr. J. S. Cullinan and their appreciation of his great services to The Texas Company and to the oil industry, found expression in a plan which has just been completed by the presentation to him of a splendid Silver Service, on behalf of thirty-five hundred employees and other oil industry associates. Thirty-one states were represented in the location of the employees. The American Flag in colors on silk, photographs of the Silver Service and of Mr. Cullinan, a series of etchings illustrating different spheres of the oil industry bordering the pages giving the names of the donors, assembled in a sumptuous and beautiful book, were presented with the Silver Service.

The Service is shown in the opposite engraving from a photograph, with a brief description of style and ornamentation. The great center tray is engraved with an oil derrick and the following inscription:

Presented to
Joseph S. Cullinan
December 25, 1913, at Houston, Texas,
By Employees of The Texas Company
And Other Oil Industry Associates
A Token of Affection and Esteem

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 twenty-fifth 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 twentieth day of the month. All are invited to co-operate.

Pipe Line Dept.	A. M. Donoghue, Houston.
Natural Gas Dept.	D. P. Harrington, Fort Worth.
Fuel Oil Dept.	E. B. Joyner, Houston.
Refining Dept.	C. K. Longaker, Houston.
Marine Dept.	W. L. Conover, Houston.
Legal Dept.	A. R. Weber, New York.
Treasury Dept.	F. C. Pannill, Houston.
Comptrollers' Dept.	Lee Dawson, Houston.
Sales Dept., S. Territory	B. E. Emerson, Houston.
Sales Dept., N. Territory	D. A. Vann, Houston.
Export Dept.	S. Slattery, New York.
Purchasing Dept.	J. B. Nielsen, New York.
Railway Traffic Dept.	J. E. Byrne, Chicago.
Producers	C. S. Young, Houston.
	P. C. Harvey, Houston.

FUEL OIL Vice-Pres. Noble has been at DEPT. New York headquarters for two weeks, accompanied by Asst. Mgr. Jordan from Chicago.

O. E. Corlson has been transferred from Sales Dept. at Chicago to position of Chief Clerk to Asst. Mgr. Jordan, *vice* J. H. Van Moss who takes a position as Salesman under Mr. Jordan.

REFINING DEPT.

Mr. W. E. Leach, secretary to Mr. F. C. Smith, terminated a five-year engagement by marrying Miss Marie Williams on Christmas Day at her home in Florein, La. Previous to this time Miss Williams has been the recipient of many showers and congratulatory parties, being one of Florein's belles. Mr. Leach has been at the Port Arthur Works for some time and is considered one of the most popular and capable men in his line in the Refinery, and we join in a body to offer him our sincere wishes for happiness and success. He is welcoming his friends in his newly purchased bungalow at 403 Memphis Avenue.

Mr. M. G. English, popularly known as "Red," who has been in the employ of the construction department of the Stone-Webster Corporation for several years, has entered the service of The Texas Company, and has been assigned duties on construction work at Port Arthur.

On Jan. 20 a 114-ounce boy arrived at the home of Mr. and Mrs. H. M. Herron at Port Arthur, Texas. Mr. Herron is

all smiles, and reports mother and son doing nicely.

On Jan. 25 a 144-ounce girl arrived at the home of Mr. and Mrs. Glenn Evans, Port Arthur, Texas.

A special from Mobile announced the arrival of twins at the home of Mr. and Mrs. Crawford on January 27. They are sturdy chaps, M. Francis weighing 7 pounds and E. Frazer weighing 6¾ pounds.

Mr. C. C. Hawkins returned to Port Neches on Jan. 20 after spending several weeks in New York.

Mr. F. C. Smith, General Superintendent of Port Arthur Works, was a Houston visitor in January.

Mr. T. J. Mullin, General Superintendent of Southern Terminals, visited all the Southern Terminals during the month of January.

Mr. R. H. Waldron of the Houston Office returned to Houston Jan. 10 after a very pleasant visit with his parents at Canal Dover, Ohio.

Mr. Walter K. Megarity, who has been spending part of his vacation with his parents at Corsicana, Texas, paid a visit to the Houston Office.

Mr. R. Amundsen, Chief Clerk of the Bayonne Terminal, spent several weeks in Houston. He visited Port Arthur Works, Port Arthur Terminal, and Port Neches Works.

Mr. W. N. Long, Chief Clerk of Port Arthur Works, spent several days in Houston.

Mr. H. K. Scranton, Stock Clerk, Terminal Division, Northern Terminals, has resigned his position, effective Feb. 1.

Mr. T. Eaton has been transferred from Baltimore to Delaware River Terminal. Mr. D. Dichter has accepted a position as Clerk at Baltimore Terminal.

Mr. F. Strohmer has been employed to do the stenographic work at Baltimore Terminal.

Mr. J. L. Wilson of the Houston Office spent several days visiting the Works and Terminal at Port Arthur. Mr. Wilson was formerly Chief Clerk at Port Arthur, and this was his first visit since about three years ago. He was much interested in the many improvements.

Mr. P. E. Hastings and Mr. J. W. Dickey, both of the Houston Office, are enthusiastic over their hunting trip to Katy, Texas. They "bagged the limit,"

TEXACO STAR

and were very considerate in sharing the game with the boys in the Houston Office.

On Jan. 27 a marriage license was issued to Alexander McClintock and Edna Elizabeth Dupry. Mr. McClintock is Time-keeper at Port Arthur Works, and Miss Dupry the ever-obliging and popular telephone operator in the Port Arthur Works exchange. A little excitement like this once in a while would hold interests in Port Arthur instead of Beaumont. We have here about eight bachelors to one maid. Mr. Fred Manley might be kept busy getting telephone girls.

MARINE
DEPT.

Mr. W. L. Conover, of the Marine Department at Houston, was in New York the latter part of December and the early part of January.

We also received a visit at the New York offices from Mr. Carl Kistler, formerly of this department, who is now with the Panuco Transportation Company at Tampico.

SALES DEPT.
S. TERRITORY

Without detracting in the least from the merit of the loyal and enthusiastic salesman whose record in the Philadelphia District was reported in the December issue, it should be stated that the record does not appear very "remarkable" to the Sales Department, Southern Territory. We have many salesmen whose sales regularly include practically our entire line of products and regularly exceed in value the record of our Philadelphia comrade, and no doubt the same is true for the Northern Territory at large.

Superintendent Monroe, of the Pueblo District, reports that his district has secured signed orders for a volume of Specialties and Lubricating Oils for future delivery, beginning April 1, to the Hardware and Harvester trade, which gives him second place, the Houston District still leading.

The second annual meeting of the roofing salesmen of The Texas Company took place Dec. 29-31, the several scenes being set in Beaumont, Port Neches, Port Arthur and Houston. W. E. O'Neill, manager of the Roofing Division of the Sales Department, started the plan a year ago. It has been so successful that it is now to be an annual institution. The fol-

lowing (condensed) account is taken from *The Gulf Coast Lumberman* for Jan. 15, 1914:

The meeting was an inspiring one—interesting and instructive in every particular. The crowd gathered in Beaumont Dec. 28. Monday, Dec. 29, they went to Port Neches, where they thoroughly inspected the great plant in which Texaco Roofing is manufactured. They also went to Port Arthur and visited the refinery, case and package plant, and terminal of the Texas Company at that point.

On Dec. 30 they assembled in the Directors' Room on the tenth floor of The Texas Company Building in Houston, where they put in the day in business sessions of the most interesting order. For instance, they staged playlets, in which one salesman represented a prospective customer, and another a Texaco salesman. Finally they invited in a live retail lumberman, Mr. V. M. Angle, manager of the Jesse H. Jones Lumber Company, of Houston. Mr. Angle consented to play the part of the retail lumberman, and they sent several salesmen against him, the dialogue in each case being just like it would have been in a lumber yard, with the retailer on the defensive, and digging up every argument against buying and carrying a stock of roofing, and the salesman—spurred on by his fellow salesmen and superior officers as witnesses—using his best arguments. Mr. Angle made a very good trial horse, and they all had a lot of amusement and no little instruction from it. This was only one of the ways of practically instructing the salesmen. They lunched together at a special spread and that night went in a body to the theater, as the guests of the firm.

The afternoon of the 31st they wound up the session with a trip down the Ship Channel to the famous San Jacinto Battle Grounds, on the Company's yacht, the *Virginia*.

Mr. O'Neill is elated over the success of the second meeting, and feels that the investment is a first-class one for the Company.

The following attended this meeting:

W. E. O'Neill, Houston
G. R. Brookshire, Houston
C. J. Reed, Beaumont
L. T. Parker, Dallas
C. N. Turner, Houston
Craig Harris, New Orleans
F. K. Dorrance, Atlanta
M. B. Hammond, Atlanta
R. D. Mooney, Houston
H. P. Wills, Houston
J. A. Gallagher, Jacksonville, Fla.
G. L. Baker, Atlanta
L. L. Haddock, Houston
L. A. Smith, Houston

SALES DEPT.
N. TERRITORY

Mr. Galbraith's ad., shown on the inside of the back cover of last month's issue, was found of sufficient value to be used in the practical work of our Advertising Division. It will be placed in the *National Engineer* and in the *Popular Engineer* for February.

A meeting of Salesmen and Station Agents was held by Supt. Gatchell in the Norfolk District, Dec. 22-23. Many subjects were discussed—to the benefit of all who attended.

Mr. J. M. Dempsey became Agent of

TEXACO STAR

our Portland, Me., Refined Station Dec. 1. He is familiar with the Portland trade and is highly spoken of by former employers.

Mr. Howard R. Conger has been appointed Agent of the Newark, N. J., Filling Station.

Mincola, L. I., is one of our new stations, with Mr. Walter Lauck in charge.

Mr. Harvey B. Wright joined the Philadelphia District selling force on Jan. 1.

Mr. Charles Hottum has entered our service as Salesman in the New York District.

Department Agent Elwood paid a visit to the Chicago District the first of the year.

Mr. J. W. Lowery has been made Agent of the Hawthorne Street Station, Chicago.

Monthly Meetings of Superintendents will hereafter be held on the second instead of first Monday of the month.

OFFICE BOYS' CONTEST

Several months ago the plan of offering an appropriate prize to the most efficient office boy in the New York offices was suggested and advocated by Mr. W. F. Parish. The plan was approved by the officials of the Company. Rules setting forth the duties and governing the department of the office boys were compiled by Mr. J. R. Pouncey. These rules should be valuable as a guide to office boys throughout the Company. They are as follows:

TABLE OF EFFICIENCY AND RULES OF CONTEST		Per Cent
Personality	Punctuality.....	15
	Promptness.....	15
	Politeness.....	5
	Personal Appearance.....	5
Routine Efficiency	Attention to Desk.....	10
	Attention to Mail.....	20
	Attention to Office.....	10
General Efficiency	Accuracy and Neatness.....	20
Total.....		100

Only a small percentage is allowed for politeness and personal appearance, not because these qualifications are less important than others, but because they are qualifications that every boy is expected to possess and exercise at all times.

Punctuality consists of reaching the office on time in the morning, always a little in advance of employer, in order to see that the office is in a neat and orderly condition. Returning from lunch promptly, or before the hour required, and leaving in the afternoon after employer has gone and never before regular closing hour, unless special permission to do so has been requested and granted.

Promptness consists of answering all calls (both telephone and buzz) immediately and obeying orders given at once, or at least without unnecessary delay.

Politeness consists of being attentive and respectful and always acting in a gentlemanly manner, never being guilty of rudeness by giving a short or impertinent answer, and endeavoring to be obliging at all times.

Personal Appearance consists of cleanliness and tidiness, keeping face and hands washed, shoes polished, clothes neatly pressed, linen clean, etc. This does not mean wearing expensive clothes but does mean that you are to take care of and look the best in those you have. Smoking cigarettes, or using tobacco, is absolutely prohibited and any boy indulging in the use of same while on duty will be dismissed from the service of the Company.

Attention to Desk—Keep desk free of dust and ink spots or dirt of any kind. See that ink wells are kept filled and that papers are always neatly arranged. Keep pencils sharpened and properly placed, together with scratch pads, letter opener, matches, ash tray, etc.; in fact keep everything your employer uses on his desk neatly and conveniently arranged.

Attention to Mail—All mail should be delivered immediately and care should be taken to see that same reaches the proper persons. Care should be exercised to see that letters are neatly folded and put in proper envelopes and carefully sealed. This is very important.

Attention to Office—See that everything is kept clean and in its proper place. Keep paper and litter off the floor. See that windows are kept clean and opened or closed as necessity requires in order to keep the office comfortable and well ventilated. Do not allow other boys to lounge in the office when your employer is away. In fact be on the alert to see that the general appearance of the office is neat in every way.

Accuracy and Neatness—Accuracy is absolutely essential to success. Avoid being careless and indifferent in your work. Accuracy and neatness not only apply to work you may do dealing with figures and writing, but also means care and precision in the performance of any duties assigned to you. You should bear in mind that anything you are called upon to do is worth doing well.

As soon as the above rules were prepared, eighteen office boys in the New York Office were called together and Mr. Pouncey explained to them the intent and purpose of the contest. He dwelt on efficiency as applied to office boys; he stated that an efficient office boy always got along very quickly; that there was always a demand for such boys, and that when they grew up their efficiency was one of their greatest assets. Mr. Parish made an address during which he told the boys that they were a very important part of a tremendous selling organization; that the whole aim of The Texas Company was to manufacture and sell its goods, and that the office boys could in many ways assist in the selling of those goods. For instance, as simple a thing as the proper placing of the stamp on an envelope so that the mail could be handled in the quick routine way by the Post Office would affect a bid getting to the customer on time; by carelessly placing the stamp so that it would not be canceled by the machine at the Post Office, the letter might be thrown out of the regular routine and passed back for cancellation by hand. In this way the letter might miss the proper mail, and it could easily happen that this letter would be one which was necessary to close up some important deal. A case had actually happened in which one of our salesmen closed a contract exactly twenty minutes before a lower competitive bid was received. That competitive bid may have been delayed by some negligent office boy. Considerable stress was laid upon the appearance of all of the office furniture, and the deportment of the boys in the halls and wherever they might come in contact with the buying public, the idea being that everything that was done should be for the purpose of securing the approval of a possible customer.

After the talk, pictures were shown by the lantern illustrating the standard in one particular department as to the arrangement of the furniture and the appliances on the desks. The statement was made that each office had its own particular standard, each man requiring different equipment for conducting his business; that the absence of ink in the ink well or of the proper kind of a pencil or paper might have a tendency at times to annoy and throw the chief man considerably off his balance; and that it was an important part of the work of the office boy to see that everything was supplied regularly so that the usual routine or general work of the office could proceed day by day in an orderly, well-conducted manner.

TEXACO STAR

As a substantial manifestation of his interest in the boys, their work and advancement, and particularly the contest then being entered into, Mr. Parish personally offered as the first prize a solid gold "Texaco" watch fob, beautiful in design and workmanship, and something a boy could well be proud of not only as a reward of merit for efficient services rendered to his employers, but as a handsome ornament which he could put to practical service in after years.

It was explained that these contests would run for a period of six months, and hereafter prizes would be awarded to the boys on June 30 and Dec. 31.

While all of the office boys undertook their work with renewed energies and apparent continuity of purpose, yet, as the days wore on, the enthusiasm of some of them somewhat abated; and when the "home stretch" of the last two or three weeks was reached, the contest was narrowed down to half a dozen boys, although splendid records were made by nearly all.

At the beginning of the contest it was only intended to award one prize, but as such a large number of boys made excellent records, it was decided to give three prizes; the first prize to be a gold "Texaco" watch fob, the second prize a silver fob, and the third prize a bronze fob, the fobs to be suitably engraved as having been presented by The Texas Company for efficiency.

By close personal observation on the part of those who had the contest in hand, coupled with regular and frequent inquiries of the departments in which the boys worked, and after careful consideration of each and every circumstance, the record of the following boys showed they had tied for first place:

		Percentage
Geo. S. Fischer,	General Office boy.....	99.46
Arthur Hair,	Purchasing Department.....	99.46
Wm. P. Gaynor, Jr.,	Marine Department.....	99.46
Fritz Ehardt,	Advertising Div. Sales Dept.....	99.46
Harry Young,	Lubricating Div. Sales Dept.....	99.46

The percentages were the averages attained for fourteen weeks during which the contest ran, 99.46 being the highest and 76.07 the lowest.

So many of the boys having attained the same percentage efficiency during the contest, a committee was appointed consisting of the heads of seven departments, whose office boys were not among the five named above, and, after a careful inspection of the office or offices kept by each boy and inquiry into their duties, the vote was as follows:

	Votes for 1st Prize	Votes for 2nd Prize	Votes for 3rd Prize	Points
Arthur Hair.....	3	1	-	35
Geo. S. Fischer.....	2	2	-	30
Harry Young.....	1	2	2	25
Fritz Ehardt.....	1	1	2	20
Wm. P. Gaynor, Jr.....	-	1	3	12½
Total Votes.....	7	7	7	

As a means of arriving at a fair basis of award, a first prize vote by a member of this committee was given a value of 10 points, second prize 5 points, and third prize 2½ points. After canvass of the votes, the prizes were awarded as follows:

1st Prize—Arthur Hair
2nd Prize—George S. Fischer
3rd Prize—Harry Young
with Fritz Ehardt and William P. Gaynor, Jr., coming in for honorable mention and special commendation.

It might be stated that every boy entering into this contest showed a very appreciable improvement in his work throughout the entire period, and we shall not be surprised to see any one of them stand at the head of the list when the next prizes are awarded.

EXPORT DEPT.

A recent cable dispatch from The Texas Company (South Africa) Ltd., tells us that a number of our boys have been called in to do military service during the serious disturbances caused by the general strike. They belong to a corps resembling somewhat our Militia.

Shipments of cargoes of Texaco products in bulk and in packages were made during January by the following steamers:

<i>Roumanian Prince</i>	<i>Garonne</i>
<i>Hilding</i>	<i>Camillo</i>
<i>Hynford</i>	<i>Aboukir</i>
<i>Aureole</i>	<i>Viking</i>
<i>Ellen</i>	<i>Isabela</i>

bound for the West Indies, British Guiana, South America, Philippine Islands, China, West Coast of Africa, United Kingdom, Holland, Belgium, France, and Italy.

RY. TRAFFIC DEPARTMENT

C. W. Owsley, M. C. B., clerk in the Equipment Division, made a trip to Bay City, Kingsville, and San Antonio, inspecting and looking after the maintenance of our rolling stock.

Chas. B. Hodges, stenographer in the Equipment Division, has made his annual visit to Georgetown, Texas.

TREASURY DEPT.

During the past month Treasurer Green made two hurried business trips to Birmingham, Ala.

General Creditman Symms visited the Brownsville section during the latter part of January.

LATE FROM MARINE DEPARTMENT:

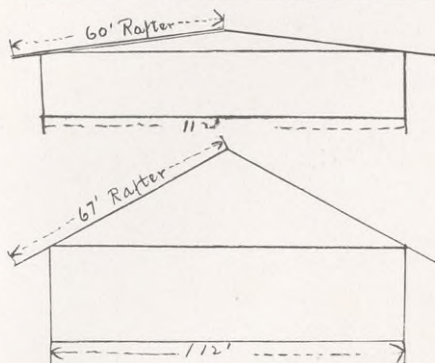
The Belgian barge *Tuxpam*, owned by the Continental Petroleum Company, has been added to the fleet operated by the Marine Department. The *Tuxpam* will be used principally trading between Mexico and United States Gulf ports. She will be under the command of Captain W. F. Young.

Captain C. A. Peters, master of barge *Tulsa*, has resigned. Captain Albert Johansen, formerly first mate of barge *France Marie*, has been appointed to the command of the *Tulsa*.

SUGGESTIVE INDEX OF ARTICLES IN CURRENT PERIODICALS

THE MAIN INTEREST IS INDICATED BY
DEPARTMENTAL CLASSIFICATION OR BRIEF COMMENT

- EXECUTIVES** Industry in a Foreign Mirror—*N. Y. Times Annalist*, Jan. 26, 1914.
"Comments of visiting (German) scientists on the American business of production, its management, its tools, and its labor."
Manifest Destiny of Liquid Fuel—*Petroleum Age* (N. Y., Vol. I, No. 1), Jan., 1914.
- PIPE LINE** Comparative Pipe Line Statistics—*Petroleum Age* (N. Y., Vol. I, No. 1), Jan., 1914.
- REFINING** Experiences in Efficiency, V. Reducing the Factory Expense, by Benj. A. Franklin—*The Engineering Magazine*, Jan., 1914.
Detroit's Municipal Asphalt Plant—*Municipal Engineering*, Nov., 1913.
Illustrated description of the plant and its operation.
Extinguishing Fires in Oils and Volatile Liquids—*Jour. Am. Soc. Mech. Eng.*, Nov., 1913.
Shop Lighting, by Ward Harrison—*Elect. World*, Nov. 15, 1913.
Locating Leaks in Water Mains—*Water Power Chronicle*, Nov., 1913.
- LABORATORY** Value of Mixed Carbon Test, by H. B. Pullar—*Canadian Engineer*, Nov., 1913.
The World's Resources in Light Combustible Extracts of Petroleum, Their Development and Means of Increasing Them (Ressources mondiales en carburants legers extraits des petroles, leur developpement—moyens de les accroitre). M. A. Guiselin.—*Mem. Soc. Ing. Civ. de France*, July, 1913.
- CASE AND PACKAGE** A Box Nailing Machine—*The Eng. Mag.*, Jan., 1914.
Driving and clinching nails in thin or three-ply boards.
- TERMINALS** Freight Burtoning at Marine Terminals—*Int. Mar. Engng.*, Nov., 1913.
Illustrated discussion of the advantages of high tiering by machinery.
- MARINE** Twenty Years Progress in Marine Construction, by Alexander Gracie—*Engineering*, Oct., 24 1913, and *Mech. Engineer*, Oct. 31, 1913.
- SALES** My Search for Advertising Laws, III, Size of Space—*System*, Jan., 1914.
When Third Class Mail Goes Unread—*System*, Jan., 1914.
"A waste basket inquest held over the third-class mail sent out by fifteen manufacturers."
A New Angle on the Training of Salesmen—*Am. Mach.*, Nov. 13, 1913.
"Don't Send a Salesman"—*Am. Machinist*, Nov. 27, 1913.
A word to the wise is sufficient.
Selection of Oils for Lubrication—*Horseless Age*, Nov. 5, 1913.
Branded oils the safest.
Experimental Pavement in Philadelphia—*Engng. Record*, Dec. 6, 1913.
Three miles of short sections of different types of surfacing, Texaco asphalt being one of them.
- EXPORT** American Trade with China, by L. R. Freeman—*The Engng. Mag.*, Jan., 1914.
Mr. Freeman writes with much knowledge about one of the greatest future markets of the world.
The New Vistas—*N. Y. Times Annalist*, Jan. 19, 1914.
Probable effects of Panama Canal upon International Commerce. Contains excerpts from the "Special Panama Canal Number," issued Dec. 31, by the *London Times*.
Economic and Commercial Situation in Peru—*The Iron Age*, Nov. 15, 1913.
What Japan is Doing on the Mainland—*Am. Rev.*, Feb., 1914.
World's Markets for American Cars—*Automobile Jour.*, Dec. 25, 1913.
Conditions which must be met to secure export business—How last year's shipments were distributed—Possibilities in the several countries.
- PURCHASING** Records for the Purchasing and Supply Department—*The Engng. Mag.*, Jan., 1914.
- RY. TRAFF.** Waste in Cars—*N. Y. Times Annalist*, Jan. 26, 1914.
How the English railroads propose to find a solution of the "l. c. l." problem with which American managers are struggling.
- PRODUCERS** Possible Causes of the Decline of Oil Wells and Suggested Methods of Prolonged Yields—U. S. Bureau of Mines, Tech. Paper 51.
- GENERAL** Some of the Cost of Starting Business, by Prof. M. E. Cooley—*N. Y. Times Annalist*, Jan. 26, 1914.
"Many things besides physical property must be paid for and charged to capital."
Practical Introduction of Efficiency Principles—A New Method of Approaching the Efficiency Problem, by C. E. Knoeppel—*The Engng. Mag.*, Jan., 1914.



NOTICE A DIFFERENCE?

The upper building is roofed with Texaco—250 squares being required to cover the building 112x200. The lower building is the same size but if covered with corrugated iron or shingles 278 squares of surface require roofing. If corrugated add $\frac{1}{8}$ for lap.

The difference of course is in the pitch. Shingles or corrugated iron can't be laid successfully on less than "quarter pitch." Texaco can be laid "flat as a pancake" and not leak a drop.

Let us tell you about Texaco "overlap," the great roofing for flat roofs.

THE TEXAS COMPANY
Houston

A Crystal Light

Doesn't that suggest a clear bright light?

It does to us, and that is why we chose the name "Crystalite" for our illuminating oil.

TEXACO CRYSTALITE is a crystal light, giving forth mellow, penetrating rays. It gives no smoke nor smell and is good to the last drop.

TEXACO CRYSTALITE will not fluctuate. It gives a steady glow.

The next time you buy illuminating oil don't merely ask for "a gallon of kerosene." Ask for TEXACO CRYSTALITE and find out why we have named our illuminating oil "the light of the home."

TEXACO CRYSTALITE costs no more than ordinary kinds and most good stores have it.

Remember the name. It will be worth your while to discriminate.

THIS advertisement was sent in by Mr. C. J. Reed, salesman of the Roofing Division. We want to take space on this page to thank him for this idea. It is a truly valuable one, giving us, as it does a clean cut sales argument.

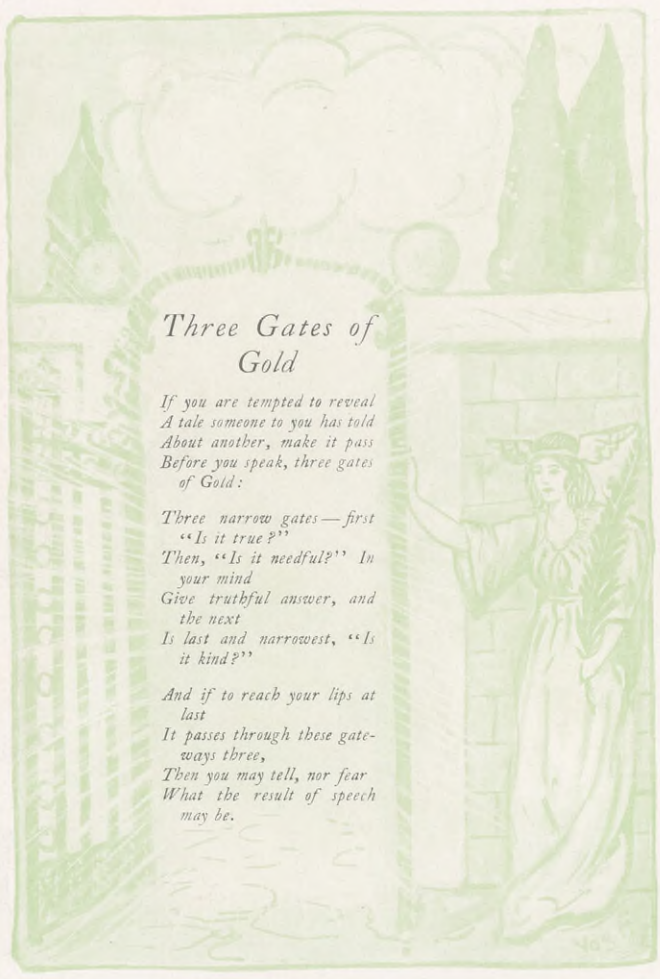
This is the kind of material that we hope to get from the "men on the firing line," and this particular suggestion from Mr. Reed comes up to our highest expectations.

No doubt there are others of you engaged in the manufacturing or selling who daily see some particular excellence in Texaco Products, and we are hopefully waiting the time when you will set it in writing and send it to us.

Again we thank Mr. Reed and hope that his example will set others at work to send us suggestions of this nature.

WE are gratified with the quantity and the quality of the suggestions sent in for this month, and have had quite a hard time deciding which would be the second one for this page, and finally concluded to print this idea for a folder, gotten up by Mr. Albert Bush.

Mr. Bush is a young man employed as a stenographer in the Export Department, and we are glad to print his advertisement because it shows that he ~~was~~ sat down and thought out the qualities that make "Crystalite" worthy of the success it has achieved.



Three Gates of Gold

*If you are tempted to reveal
A tale someone to you has told
About another, make it pass
Before you speak, three gates
of Gold:*

*Three narrow gates—first
“Is it true?”
Then, “Is it needful?” In
your mind
Give truthful answer, and
the next
Is last and narrowest, “Is
it kind?”*

*And if to reach your lips at
last
It passes through these gate-
ways three,
Then you may tell, nor fear
What the result of speech
may be.*