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Facts and Fallacies

The time has come to face facts. When this is done, the inherent fallacy of all political solutions for social and economic difficulty is apparent. The brave new world of the Four Freedoms, of security and general happiness, can be attained only on the basis of the well-directed and reasonably-rewarded work of the individual citizen. No political nostrums, left, middle or right, can replace this fundamental basis. Government solutions are necessarily based on taxation, control, restriction. Government works through bureaucracy which, by its nature, is a “dead hand”—mediocre, unimaginative, stifling. Enlightened private enterprise, stirred on by the profit motive and by competition, must be resourceful and efficient to survive.

Another aspect is the myth that government by some magic creates wealth. The opposite is the truth. It is as true today as in the 19th century that the less government the better.

What are the right functions of government? First, the preservation of order and the protection of the freedom of the citizen. Second, the protection of the nation against external aggression. Third, the supervision of essential services for the community. Fourth, the securing of favorable markets for trade. If government, for its part, confines itself to these minimum functions, it is doing all that it should do in an enlightened democracy.

An enlightened and efficient democracy is one in which capital and labor realize that everything depends on the well-directed and reasonably paid work of the efficient individual citizen. Problems of employment, security, and leisure can and should be solved by the joint efforts of capital and labor independent of government. Direct action is the key to the whole problem. If a great construction project is needed, let it be undertaken as a sound business proposition, not merely as an expedient to absorb the unemployed. If retiring pensions are to be guaranteed to all workers, let industry and labor make provision jointly. The same applies to the development of trade, to pioneering enterprise, and to the whole range of collective creative activity.

In all this there is no “reaction” or denial of the wisdom and indeed the necessity of great social progress. On the contrary, this way means well-founded progress.

What is the alternative? The perpetuation in peacetime of the controls of wartime. The persistence of bureaucratic management, and ultimately the disappearance of private enterprise, stifled by paternalism. That way lies slowing-down, disillusionment, chaos and revolution.

The choice is simple. Either we admit political solutions, realizing that we shall become inevitably an authoritarian bureaucratic and inefficient society; or we determine to retain the basic characteristic of free democracy, enlightened private enterprise, working through it to the fullest possible enjoyment of the fruits of the earth, bountifully and universally distributed. There is no short cut to the millennium. There is no substitute for the free work of the individual citizen.

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SPRING • 1943
WALTER C. TEAGLE RETIRES

President of Imperial Oil Limited from 1914-1917, Walter C. Teagle has retired as Chairman of the Board, Standard Oil Company (N.J.).

Retirement of Walter C. Teagle from the Chairmanship of the Board of the Standard Oil Company (N.J.) recalls the great contribution made by Mr. Teagle during the years 1914-1917, when he was president of Imperial Oil Limited, to the development of a dynamic self-sufficient oil industry in Canada; and the leading part he played in gearing that industry to the then-unprecedented demands of Canada's first World War effort.

To the older ranks of Imperial Oil employees, the name Teagle stands for a far vision and unerring energy which expanded the Company's physical equipment to meet the needs of a rapidly developing country whose continued progress depended in part upon sufficient supplies of petroleum.

It was during Mr. Teagle's presidency of Imperial Oil Limited that the International Petroleum Co. Ltd. began to develop oil resources in South America so that Canada would have a sure source of supply. At that time, because the rate of finding oil in the United States was lagging behind the rapidly increasing rate of consumption, oil famines in that country were freely predicted and the possibility of an embargo on United States exports could not be overlooked. As Canada was so largely dependent upon the United States for petroleum, it was desired to establish other sources of supply and this was one of the great projects carried through under Mr. Teagle's energetic direction.

International Petroleum acquired a productive area in Peru where the International men soon established a modern oil camp with railways, highways, pipe lines, docks, tankage, housing, hospitals, churches, water systems, clubs and all the other paraphernalia of life as it is lived in the average Canadian town.

At the time Mr. Teagle became president of Imperial, the Company operated one refinery which had been established in 1886, the year of its founding, at Sarnia, Ont. Under Mr. Teagle's direction the machinery was set in motion which added five more plants, located at Halifax, Montreal, Regina, Calgary and Iqen, B.C. During Mr. Teagle's presidency the distributing equipment was greatly expanded with the result that ready supplies of petroleum were made available to meet all needs of the developing industries of agriculture, mining, manufacturing, forestry and fisheries.

Although called to assume heavier responsibilities in 1918, Mr. Teagle retained a keen interest in Imperial Oil's welfare and continued a close contact with his former associates in Canada. He has never lost his love for the Canadian wilderness and as a keen sportsman, has projected many a fishing and hunting trip to Canada. The weight of his responsibilities has sometimes resulted in hasty

A real outdoors man and enthusiastic fisherman, Mr. Teagle (on the left in the picture below) was never happier than when off in the woods in rough clothes.

WALTER C. TEAGLE

minute cancellations of these projects, but whenever he was able to get away he entered into his recreation of salmon or trout streams or in the haunts of game fowl in the Prairies with the same zest and enthusiasm that has been characteristic of all his activities.

Mr. Teagle is of English descent and was born at Cleveland, Ohio. His mother's father was one of John D. Rockefeller's first associates and his father, who came to the United States in 1871, became a partner in an oil firm in Cleveland which in the course of time became part of the Standard Oil organization.

In 1899 Mr. Teagle graduated from Cornell University where he finished the four-year course in three years and promptly went to work as a salesman with his father's company. In 1905 he was placed in charge of European distribution for the Standard Oil Company of New York and in this capacity became familiar with all aspects of the export business. Six years later he was elected a director of the Standard Oil Company (N.J.) and in 1911 became a vice-president of that Company. Early in 1914 he resigned this position to assume the presidency of Imperial Oil Limited. A few months after the United States entered the war in 1917, Mr. Teagle was asked to accept the presidency of Standard Oil Company (N.J.), succeeding A. C. Bedford, who was elected Chairman of the Board. (Continued on page 7)
W. S. FARISH HAS PASSED ON

President of Standard Oil Company (N.J.)

The news of the sudden passing of Mr. W. S. Farish, president and chief executive officer of Standard Oil Company (N.J.), shocked and saddened him and the industry everywhere. One of the outstanding oil men of his generation, his loss was felt deeply, not only by the organization he headed, but by the industry as a whole.

Oil men who have wrestled drill pipe from the windy height of the fourth floor, who have changed bits and repaired mud pumps, who have known the thrill of bringing in a wildcat and the empty disappointment of a “duster”—such men bear a certain resemblance to Mr. Farish. He was a big man. His hands were big and square, as the hands of men who have worked in the fields. He used to thrust them deep in his rear trouser pockets as he strode down the hall to his office. His very walk radiated the calm strength that was part of the man’s character.

He was a friendly person—not a backslider, for he had about him a quiet dignity—but friendly with a deep sincerity and an innate Southern courtesy.

Though he carried a tremendous administrative burden he never seemed to be in a hurry. Newspaper reporters were invariably impressed with the manner in which he chatted freely with them, chewing the end of a big cigar and with one leg thrown over the arm of a chair as though he had all afternoon. Later, long after office hours, you might find him in his shirt sleeves, if the day was warm, working unerringly on the big pile of papers at his elbow.

Like so many oil men who gained their start in the producing end of the business, he loved the outdoors. He was never happier than when out hunting with his fellow executive and close friend, W. C. Teagle, and a group of companions. When ever he could get away, which occasions were few in recent years, he liked nothing better than to go hunting for a few days with his guns and his dogs. He was fond of horses and maintained a small stable, though he was unable to spare the time of hunting.

He was a practical oil man and knew intimately every phase of the industry. He had a memory for figures and for operating details that continually amazed not only his associates but various government departments in Washington, where he was regarded as one of the best informed men in the industry. He had a passion for accurate statement and could not be drawn into committing himself to a fact unless he felt would not square with the facts. Despite his cross-indexed mind, he never spoke for the record without certain knowledge. The minutes of various Congressional hearings at which he was invited to testify contain such statements as “I don’t know, sir, but I’ll be glad to get that information for you.”

He was born in Mayesville, Miss., on February 23, 1881. His eye was on the law, and since his parents had only limited means he taught school to earn enough to help himself through college. He earned his law degree from the University of Mississippi in 1900 and went to Claridale, Mississippi, where he engaged in practice for a brief span.

He was still only 19 when the following year stories of what was happening in Beaumont, Texas, began to pass by word of mouth through the Mississippi Valley. Oil has been discovered there and immediately the very sound of it called to something in the young lawyer’s blood. He closed his books and went to seek his fortune in this new Eldorado.

For a while he worked as a roughneck in the fields and finally, after scraping together a little capital, organized the Brown, Farish Oil Company. For the next twelve years he led an up and down existence, drilling wells under contract.

During this time Mr. Farish became acquainted with R. L. Blaffer—whose death preceded that of his lifelong associate by only a few weeks. The two men, together with the late R. S. Sterling, afterwards governor of Texas, H. C. Wiens, now president of Humble Oil and Refining Company, and a few other friends, formed the Humble in 1917. Mr. Sterling was president, Mr. Farish vice-president, Mr. Blaffer was secretary and treasurer of the new company.

As a result of his early activities in the development of Texas oil, Mr. Farish was the unanimous choice of independent producers for the presidency of the Gulf Coast Producers Association in 1915. When the United States declared war on Germany the late A. C. Belford, then chairman of the board of Standard Oil Company (N.J.) was asked by the U.S. Food Administration to organize a group of representative men to insure unified action in supplying the Allies with petroleum products.

Mr. Bed ford and W. C. Teagle, then president of Standard, immediately suggested Mr. Farish as a spokesman for the Texas producers, and he was invited to come to New York as a member of the National Petroleum War Service Committee. Impressed with Mr. Farish’s abilities throughout this association, the Jersey officials approached him with an offer to come into the Standard Oil family. The Humble company had been developing subsalt oil production but was meeting some difficulty in financing itself to maintain its ambitious drilling program. So Jersey bought a stock interest in the Humble, which enabled that company to carry out its plans for building refineries and pipe lines.

During the succeeding years Mr. Farish was active in affairs of the industry as well as his own company, of which he was made president in 1922. He was an early president of the American Petroleum Institute, which grew out of the old National Petroleum War Service Committee.

Mr. Farish also headed the famous Committee of Eleven, chosen by the industry to report to President Coolidge and the Federal Oil Conservation Board, making the first authoritative study of oil reserves ever undertaken in the United States.

Mr. Farish was a lifelong advocate of conservation and in 1928 fathomed the institution of proration in Texas as a means to this end. He crusaded against waste in drilling and processing.

Mr. Farish had been elected a member of the Jersey board in 1927. In 1938 Mr. Teagle, who had carried the full executive burden of the company since the death of Chairman George R. Mosher in 1926, asked Mr. Farish to come to New York as chairman of the board. It took some persuading, for the Humble president’s roots were deep in the soil of Texas. Though Mississippi born, Texas was his adopted state and he loved it with an intensity that few people outside the Lone Star State can appreciate. When he came north to accept the chairmanship of a New York company, the home that he had lived in Houston, hoping to return there when he retired. He returned, but not in life.

In 1937 stockholders at Jersey’s annual meeting were surprised when President Teagle announced his decision to “swap jobs” with Mr. Farish, who then became president and chief executive officer. In recent years, particularly since the outbreak of the war, his responsibilities increased greatly. Much of his time was spent in Washington as chairman of the Petroleum Industry War Council. Last summer he suffered an attack that alarmed his associates, but he was back on the job almost as soon as he was able to get around. Those who were closest to him were concerned about his health from that time, but he refused to speak about the matter.

Few people knew of Mr. Farish’s interest in art. He was president of the Grand Central Art Galleries, an organization of American artists, to which he gave much time as well as financial support.

Before the days of rubber shortage and gasoline rationing he liked to drive his own car. His family was constantly reminding him that the curving roads surrounding his home in New Jersey were not the level straightaways of the Texas plains. He never got around to traveling by plane and while president of the Humble used to worry about his associates who took to the air to save time. Today his son, William S. Farish, Jr., is a lieutenant in the U.S. Army Air Corps.

He died widely known and widely respected as one of the outstanding oil men of his generation. He was even better known, and loved by all who knew him, as a Texas gentleman.
Ralph W. Gallagher, President, Standard Oil Company (N.J.)

RALPH W. GALLAGHER
Elected President of Standard Oil Company (N.J.)

Mr. RALPH W. GALLAGHER has been elected President of Standard Oil Company (N.J.), succeeding the late Mr. W. B. Parish.

Mr. Gallagher was born in 1883, in Salamanca, New York. He had little formal schooling for, at the age of sixteen, he was obliged to drop out of High School and go to work. His father, who ran a hardware store in Salamanca, was stricken with a serious illness that forced his retirement and young Ralph had to go to work to help support the family.

His first job was at the Olean pumping station of the New York Transit Company in 1897. Soon he was promoted to assistant engineer. Toward the end of his first year in the oil business he was transferred to Colgrove in the Bradford, Pa. oil region, and for the next two years worked for the National Transit Company and the United Pipe Lines Company as tank gaurder, fireman, relief telegrapher and construction foreman.

The opportunity that led eventually to the presidency of the East Ohio Gas Company and the Ohio Producing and Refining Company came in 1906. East Ohio was building a pipeline from West Virginia through Ohio and Mr. Gallagher went to Akron. Two years later when the gas lines were started to Cleveland he was made paymaster and assistant to the superintendent in charge of trunk line construction.

In 1906 he was given direct charge of all trunk line work and became superintendent of towns distributing plants outside of Cleveland. Two years later President M. B. Daly called him into the general office in Cleveland to supervise all the company's properties.

From that point his advance was rapid. To his early background of engineering and construction he had added a sound knowledge of oil and gas investments and finance. In 1923 he became the first natural gas man to head the American Gas Association and he was made a director, general manager and vice-president of the East Ohio. When Mr. Daly died in 1926 Mr. Gallagher succeeded to the presidency.

During the first World War, as president of the Domestic Coke Corporation, he negotiated a contract with the Government to build a coke oven plant at Fairmont, West Virginia, for the production of toluol, basic ingredient of TNT. Today, one petroleum plant is turning out twice as much as the entire coke industry did in pre-war days.

In 1933 Christy Payne, then a director of Standard Oil Company (N.J.) with supervision of the natural gas activities, became a vice-president and treasurer. Mr. Gallagher was invited to New York to take over Mr. Payne's duties in the natural gas field. He was made a member of the Jersey board that same year and became responsible for the company's oil production in West Virginia and Ohio.

When Mr. Payne retired, Mr. Gallagher served as chief financial officer. He became vice-president in 1937 and on November 23, 1942, on the retirement of W. C. Teagle, was elected chairman of the board. Less than a week later came the death of Mr. Parish and on January 6, 1943 Mr. Gallagher succeeded him as president.

WALTER C. TEAGLE RETIRES
(Continued from page 5)

Some time ago Mr. Teagle set down his views as to the duties of a good executive in these words: "I have always been a strong believer in the human side of business life. I have tried to make each one in the organization feel that no matter how unimportant his position, the success of the business was in some degree dependent upon him, and that the personal interest and co-operation of all was essential. This, I believe, encouraged others to think for themselves, to see how in their own particular line of work they could make themselves more efficient. Once such increased efficiency was demonstrated the individual position became proportionately just that much more important. I have never been afraid to try out in a more important job a man who showed ability in a minor capacity. My thought has been to give everyone an opportunity to help himself and better his position, and I have derived much pleasure from the individual success of those with whom I have been associated. If I have assisted others it was by helping them to help themselves."

"My father taught me to do whatever work was assigned me to the best of my ability, first trying to decide in my own mind as to the best way to accom- plish the desired result and then sticking to each job until it was finished."

IMPERIAL OIL REVIEW
Work of the International Petroleum Company in Providing Modern Housing, Sanitary, Educational and Recreational Facilities, Yields Good Results at Talara and Negritos.

A good example of what can be done to establish comfortable and pleasant living facilities in a location possessing few natural attractions is Talara, chief oil port of Peru, site of the largest refinery on the West Coast of South America and outlet for the oil production of the LaBrea and Parrisie fields. While oil has been produced in this district for upward of fifty years its chief development dates from 1914 when the properties were acquired by the International Petroleum Company. At that time the yearly production of roughly 100,000 bbl. was treated in a small skimming plant and the number of employees to be cared for was relatively few.

In succeeding years the scope of operations has steadily increased; some 2,500 wells have been drilled, production has risen to around 10,000,000 bbl. yearly and a well-equipped modern refinery with a daily capacity of 19,000 bbl. is in operation. As an accompaniment of this expansion the numbers of workers has steadily increased and two flourishing towns, Talara and Negritos, have been built up with approximately 30,000 with remains fairly stable.

One of the first steps taken by the International Petroleum Company after it took possession of the property was to lay out new townsites in order to provide improved housing with all necessary facilities for its workers. Everything requisite to the health, comfort and social activities of employees and their families had to be provided and in order to do this in the most effective manner a comprehensive program of development was drawn up and adopted.

One of the problems first in order because of its urgency was the establishment of a safe and reliable water supply. In a region where rainfall is only once in twenty-five to thirty years this is a matter of importance. In the early days the few residents had been compelled to depend upon distilled sea water for drinking purposes. Soon after

At the end of the day workmen leave the Talara refinery to return to clean, comfortable homes. The entire camp was constructed in what was virtually a desert.

As a further safeguard to the health of employees and their families the company has paid careful attention to the maintenance of healthful community conditions and the provision of adequate medical care. One of the workmen undertaken twenty-five years ago was the institution of a thorough system of sanitation, the elimination of foci of infection and the taking of other measures conducive to the desired result. The company put up two hospitals, one in Talara and the other in Negritos, the populated centers of most importance in the oil zone. Subsequently it established six medical dispensaries in the less populous districts. In these hospitals and dispensaries from 680 to 680 patients are treated daily. Each of the hospitals is equipped with the most modern installations, including a complete range of surgical instruments, an x-ray set, pharmacies, an total of 150 beds. Eight doctors and a dispensing laboratory and X-ray technician are in attendance, assisted by eighty-four nurses who give all possible care to their patients.

Workmen receive free medical attention, at their homes or in the hospitals, are operated on free of charge and pay nothing for medicine. This service and the upkeep of hospitals and dispensaries, involves a yearly expenditure of $270,000. Every three years the company doctors vaccinate the whole population against small-pox and typhoid, taking in the meantime every precaution to prevent epidemics. Under the conditions outlined, the company keeps the workers in its service in the very best conditions of health, the only way to safeguard its labour. The towns of Talara and Negritos are likewise the object of intensive sanitary attention. In this respect, the health conditions of the oil zone under the charge of the International Petroleum Company compare favorably with any other place in the world.

Shortly after beginning operations the International established schools in Talara and Negritos fields. At present there are eleven schools and 125 teachers, with a total of 4,500 children registered. Three night schools are also kept up, with an attendance of 65 pupils and seven teachers. The upkeep of all these schools represents an expense to the company that amounts to approximately $75,000 yearly. An inspector, graduated from a normal college and appointed by the Bureau of Education, is

(Right) A competent medical staff with the most modern hospital equipment cares for the health of the Talara workmen and their families at the International Petroleum Company's Camp.
responsible for the supervision of education, which is given under the official programs of the Ministry of Public Education. The teaching staff is also appointed by the Bureau of Education, and the company, in addition to paying their salaries, gives them a bonus and provides housing, light, water, and other facilities at its own expense. All children of those in the company's service, as well as those of the government employees and local residents, receive free schooling, including the provision of books, copybooks, pencils, inkpots, pens, rubber bands, chalk, and material for drawing and manual work. The school premises, which are large, suitably situated and well ventilated, have good classrooms, asphalted play yards, shops for handicrafts, fields for athletics and sport, tennis courts and modern hygiene services. The furnishing is complete, with individual desks, wall blackboards, maps, pictures for objective teaching, tools, and, in general, all kinds of equipment for manual work, including sewing machines, carving tools and painter's sets. The cultural and artistic pleasures of education also receive attention. The schools have pianos and radios, and artistic evenings are frequently organized on the occasion of the celebration of the more important national holidays. Athletics and physical culture are fostered by gymnastic training, games, and contests for school championships under the guidance of the professors of physical culture. Careful attention is given to the health of school children. Medical and dental care is provided and physical examinations take place at regular intervals.

Talara and Negritos are progressive towns, well in advance of most industrial communities. They have broad well paved streets that are kept always clean and in good condition for both wheeled and foot traffic. There are no bowels or slums but all the homes are well built, well kept and equipped with the lighting, water and sewerage connections essential to modern standards of comfortable living. In addition to their wages or salaries employees are provided with dwellings and cooking fuel as well as medical care and education for their children entirely free. The International Petroleum Company does not forget that workers need healthy recreation as well as work, so a large swimming pool and a gymnasium are provided. The company has a large restaurant and a large theater. In addition, there are various clubs for social activities and sports. Workers are encouraged to participate in these activities to build a strong and healthy community.

In order that the people can supply their wants in the way of food and other essential commodities, the company has not only built sanitary markets but maintains two well-stocked commissariats, operating on a non-profit basis, for the supplying of food and clothing at low cost. While certain items are imported, the bulk of the articles consumed by the company’s employees are obtained in the country, it being the company’s policy to support local industries whenever possible. Fresh meat is sold by independent butchers at sanitary stalls provided by the company, prices being regulated by the government. A fleet of fifty-old fishing boats from Talara and Negritos provide the local market with fish, though at times there are shortages as a result of unfavorable fishing conditions. Supplies of fresh vegetables and farm produce are brought in from the Chira River valley and sold in the local markets. Rice, one of the main articles of food, is usually to be had in sufficient quantity to supply requirements, but for reasons connected with the war a distinct shortage has developed, making it necessary for the government to control distribution. The company, in cooperation with governmental agencies, supervises all food supplies, in order to maintain prices at reasonable levels. The enlightened policy pursued by the company in relation to its employees undoubtably has helped it to maintain a stable supply of labour, fond of its jobs, with which it maintains the best relations. Out of the five thousand Peruvian employees and workmen in the company's service more than one-third have completed ten years of unbroken employment; the number of those who have been with it since the commencement of its activities in 1925 runs into the hundreds. Labour disputes are practically unknown to the company, for it goes out of its way to carry out the legal rulings in favour of the working classes. The company takes particular satisfaction in the capacity and competency of its staff. The work done by Peruvian mechanics in the Talara and Negritos shops, where delicate machinery parts are being made, from the casting of the iron to finishing off the part, are a source of legitimate pride to Peruvian industry.

Refining

This is the third in the series of articles on "Refining" prepared by G. A. Purdy of Imperial Oil's Technical and Research Department. The second article dealt with one of the Power Fractions of Petroleum—Motor Gasoline. Here the story of the other Power Fractions—Aviation Gasoline and Diesel Fuels—is told.

Modern aviation fuels give today's war planes, like the Monoplane Johnson above, greater speed, faster climb and higher ceiling. High speed diesel fuels drive the powerful diesel engines of the Mark III Valentine tank.
With the advent of the gasoline engine aeronaughtics developed rapidly. In 1903, the Wright brothers mounted a four cylinder, 25 horsepower gasoline engine weighing 9 pounds per horsepower on a pair of wings—and the contraption flew. Five years later zero engines weighing 4 to 6 pounds per horsepower and developing over 50 horsepower lifted the planes that Voisin, Farman and Blériot flew. Today zero motors weighing a pound per horsepower develop almost 2000 horsepower. More powerful and still lighter motors await us in the near future.

Gasoline has given man wings but the gasoline that flies is not the gasoline that drives an earthbound motor car. An aero engine must perform equally well on the ground and seven and a half miles up. At this height the temperature is 67° F. below zero and the air pressure only a little over two pounds per square inch as compared to almost fifteen pounds on the ground. These extremes demand a special fuel to do the job. Aero-engines need a chemically stable fuel (so gum formation) with maximum pushing power in the cylinders (high octane number) and maximum power per pound to get continued maximum speed and power while lifting the lightest possible load of fuel. Furthermore, each cylinder must get equal amounts of vapourized fuel. Otherwise the pistons will push with unequal power and set up "rolling" in the motor—an unpleasant situation when there aren't four wheels on the ground. Thus the fuel cannot have "lazy ends" which overpower nearby cylinders but never reach the more distant ones at all.

The powering of man's modern wings is an exciting task and requires an exact fuel. This fuel—although called "gasoline"—is quite unlike motor gasoline. Some of the hydrocarbons found in motor gasoline will be found in aviation gasoline, but those are the survivors of a stringent weeding-out process. Many of the necessary hydrocarbons, particularly those which make aviation gasoline the "super" fuel it is, cannot be obtained by distillation of crude petroleum or from the cracking coils. The chemist has had to create new chemicals by new processes. Since cracked gasoline is ruled out as a component on account of its gum forming possibilities its high temperature aero-engines, aviation gasoline is a blend of special straight-run gasoline fractions from selected crudes, synthesized fuels, and ethyl fluid.

The octane numbers of the various grades of aviation gasoline start where those of motor gasoline leave off and run up to 100. Recently, synthesized fuels have actually passed the 100 mark. Aviation fuels of 85 and 90 octane number can be made by adding suitable amounts of ethyl fluid to a selected straight-run gasoline fraction blessed with a high content of "isoparaflin" and "aromatic" hydrocarbons. The high octane number and excellent chemical stability of these hydrocarbons make them the aristocrats of aviation gasoline. Since Mother Nature is very stingy with them, the fraction boiling in the aviation gasoline range from many crude oils cannot reach the octane number requirements of the lowest grade of aviation gasoline, even with the addition of the maximum amount of ethyl fluid. Such gasolines may, however, serve as base stock on which to build the aviation gasoline. To these base stocks the refiner must add the missing high octane components. These are called aviation gasoline blending agents.

Blending agents for aviation gasoline can be made by two principal methods. Aromatics (chiefly benzene and toluene) form a blending agent which is obtained chiefly from the coke industry by the destructive distillation of coal. European aviation fuels frequently have aromatics as blending agents. However, these blending agents have their drawbacks. Benzene (benzole) with its freezing point of 41.0° F. will settle out of aviation gasoline that is subjected to very low temperatures. Toluene is one of the 'T's in TNT and is thus needed in the manufacture of explosives. For these reasons and the fact that isoparaflins have more potential energy per pound than aromatics, blending agents developed on recently the octane numbers of synthesized aviation fuels have passed the 100 mark. "The molecular aristocrats of aviation gasoline."
The first diesel engines would accept as fuel any oil—animal, vegetable or mineral. Their cast iron combustion-chamber walls seemed indifferent to the kind of oil as long as it would burn. But after an engine's first flush of youth had passed, improper fuels took their toll. The engine outlived and complained of serious digestive disturbances. It was soon realized that proper ratings were necessary to ensure good health for a diesel engine. For its operation per pound of fuel was considered only for stationary applications where slow speed and fair fuel service were of prime importance. For those applications, the fuel was often pressed up to a hundred pounds per horsepower could be used. Today research has developed mobile diesel engines weighting 15 pounds per horsepower and diesel road engines weighing less than 2½ pounds per horsepower. Those engines are using gasoline engines out from under the hood of tractors, trucks, buses and aeroplanes. To do this, more is a reduction in weight had to be made. The revolutions per minute of a special engine had to be increased 15 to 20 per cent to give the speeds required. Originally turning over at 40 to 80 r.p.m. diesel engines may have today an r.p.m. of 2000 or higher.

The early low speed diesel engines had lots of time to burn the oil injected into it. Modern high speed diesels have to start and complete their internal combustion in 150 milliseconds. This requires a fast igniting, fast burning fuel quite different from the oils once fed to diesel engines. The early oils caused a high speed diesel engine to smoke (fatly? by smoking, spattering or refusing to start at all.

The high speed diesel engine was brought to the petroleum chemist and he was asked to prepare a diet for it. To do this the chemist had to find out what makes a good diesel fuel “good.” He learned some fuels “hang free”—and they would thus cause engine to smoke. Others fell promptly into an explosion that pushed the piston smoothly and uniformly. The best fuels brought into the chemical “innaids” of diesel fuels, the chemist found that molecules with a ring shape were the truly burning ones—the “aromatics” as designated in gasoline. The molecules with high ignition quality were chainy-like—the “paraffins” as undesired in gasoline. Saturated compound had the best combustion quality of a good diesel fuel was almost the opposite of that for a good gasoline.

A chemist then prescribed a diet to suit the speed of the engine. The higher the r.p.m. the more straight chain molecules and the fewer ring molecules. Unskilled or inefficient pump fuel was not really high speed diesel fuel. The fraction into a quality fuel lies in the skill of the “casemier” who operates the distillation unit or cracking plant whose charge is produced in great quantity into the “innaids” of diesel fuels and diesel engines. Flack of the lubrication is the years of experience of the “crackers” in distilling technical fuel. A successful blend of diesel fuel cuts down the smoke and reduces the power stroke.

PROCESSING OF DIESEL FUEL

The processing concerned in the production of diesel fuels takes place chiefly in the bubble towers. By careful control of the temperature conditions and by withstanding the product from the proper bubble tower tray, the refiner produces from crude diesel fuel a fraction of the desired boiling range and chemical characteristics suitable for high speed diesel engines. This fraction is treated in a live plant or removed from the crude tower and is then ready to supply the apparatus of a modern diesel engine. Similarly, other fractions are selected from the fraction to remove the free acids in the crude tower or from the cracking out towers to produce the heavier and less critical low speed diesel fuel.

“IGNITION QUALITY”

A test for measuring use of ignition—“ignition quality” is the determination of “cetane number.” It is much the same manner as octane numbers are determined for gasoline. Diesel fuels are compared to a reference standard oil referred to as “cetane” and “alpha-naphthylamine.” The latter strongly points efforts to ignite it as well as pronouncement as “cetane number equals 40.” If the cetane number is 80 the contrary, octane is a piston number or per excellence, octane number equals 100. The percent of cetane of diesel fuels usually range from 20 to 80. Any limit created for an octane number of 1 and is termed “diesel index.” This is a number arising from a chemical test that determines in an approximate manner the percentage of ring molecules in a diesel fuel. The simplicity and reliability of the diesel index test makes it the more usual method of indicating the ignition quality of a fuel.

Cetane number and diesel index determine the ability of the fuel to ignite and burn quickly. Ignition quality is only one of many qualities that must be considered when a fuel is chosen. Such qualities as heating value, corrosive influence, characteristics, tendency to form carbon, pour temperature, viscosity, etc., must also be considered.

Imperial diesel fuel oils are controlled in all characteristics to fit the engine for which they are scientifically alloyed to give maximum efficiency. It verifies it becomes “alloy fuel blending agent.” This is the material added to base stocks that creates the super fuel—alloy gasoline.
THOMAS MONTGOMERY RETIRES

AN EVENT of unusual interest took place at Sarnia refinery on the afternoon of January 14th, 1943, when more than one thousand fellow employees and company executives met to do honour to Thomas Montgomery, Chief Engineer of Imperial Oil Limited, on his retirement after completing almost forty-six years of service with the company. The impressive gathering and program was arranged entirely by the employees.

On the platform in the mechanical shops, which was gaily decorated with flags, were seated Mr. Thomas Quinlan, whom the employees had elected chairman for the meeting, and who presided; Lieut. Col. G. G. Stokes, M.C., V.D., master of ceremonies, and who introduced the guests; Mayor W. C. Hipple of Sarnia; the members of the Refinery Industrial Council; Robert Lucas, an old friend, who himself has more than thirty-six years' service with the company, came from Fort William to be present; and the local company officials at Sarnia. The executives who came from Toronto to take part in the ceremony were Mr. L. C. McClokey, Mr. C. D. Dean, Mr. G. L. Stewart, Mr. J. R. Simpson, Mr. R. C. Moore and Dr. Donald Macleod. Many consultants were seated in front of the platform. All had come to pay their tribute of respect and affection to an associate greatly beloved at home and abroad.

Music was furnished during the program by a local band, made up largely of refinery employees and directed by bandmaster William E. Brush.

Mr. Thomas Quinlan, who had previously been elected chairman of the meeting by the employees, presided, and stated that the purpose of those assembled was to honor Mr. Montgomery, not because he was chief engineer, but on account of their appreciation of and respect for him as a friend.

The Toronto executives told the story of Tom Montgomery's career in words which revealed their intimate knowledge and sincere affection for the man whom his fellow workers were gathered to honor. They outlined how the chief engineer obtained his start with the Imperial in 1897 with the small refinery at Sarnia which the company purchased in that year; how he came from the farm in Plympton Township to Sarnia with only a primary school education to learn his trade as a machinist. With a determination to succeed he subsequently took an engineering course by correspondence and worked his way up to become chief engineer of the company. They told bow in the early part of May 1897 the late Mr. C. O. Stillman visited Sarnia and went out word that he wanted to hire men to work at the refinery. Among many local Sarnia men who applied for work was a young man, Thomas Montgomery, machinist and engineer, and Mr. Stillman in a speech at Sarnia in 1919 recalled the incident by saying "Tom, with his great round, healthy face, greeted me with 'Say Mister, can you give me a job?'" Tom was engaged on the spot.

G. L. MACPHerson
appointed chief engineer

M. G. L. MACPHERSON was appointed Chief Engineer of Imperial Oil Limited on January 1st of this year, succeeding Mr. Thomas Montgomery who has retired.

Mr. Macpherson was born in Markdale, Ont. After attending Public School in Markdale, he went to Toronto for his High School education, attending University of Toronto Schools. In 1914 he entered the University to study Mechanical Engineering. In December of 1916 he left the University to join the Royal Naval Air Service, and in the following May he qualified as Flight Lieutenant and was attached to a night bombing squadron in France.

In May 1919 Mr. Macpherson returned to Canada and went back to Toronto University. In 1920 he was graduated in Mechanical Engineering.

His first two jobs each lasted a year. Neither offered the scope his abilities warranted and in the latter part of 1925 he offered his services to Thomas Montgomery, Chief Engineer of Imperial Oil Limited. His application appealed to Mr. Montgomery and he was hired and set to work to the drafting room as were all junior engineers. The Company's engineering department was expanding under the task of designing new refineries, and most of Mr. Macpherson's early efforts went into the design of the refinery then being built in Calgary.

It was about 1925 when Mr. Montgomery decided that George Macpherson should give some attention to process design, which is the task of designing the equipment necessary to carry out the greatly magnified scale of manufacturing, the processes developed in the Company's laboratories. He did well at this—so well that soon his work involved most of the duties of head Designing Engineer. Mr. Macpherson still felt that he needed to know more about his work, and in 1930 he was given leave of absence to attend the Massachusetts Institute of Technology for a course in the more advanced details of oil refinery design. Returning from M.I.T., Mr. Macpherson devoted his time to the development of the Company's refinery equipment and, in September of 1935 was appointed Assistant Chief Engineer in charge of the Engineering Development Department, which position he has held until his present appointment.

Mr. Macpherson, starting from a junior position like so many others in the organization who have reached positions of senior responsibility, has, through his close association with Mr. Montgomery, accumulated a very broad training. This training is not by many means restricted to engineering and its application to the oil industry, but it also carries with it a thorough understanding of all problems relating to labour and which will be of great value to Mr. Macpherson in his larger field of activities.

S P R I N G • 1 9 4 3
1943 INDUSTRIAL COUNCILS

ANNUITIES AND BENEFITS COMMITTEE

Strohla, left to right—A. Gibson, R. C.
Morrison, Stuart, left to right—L.
Thompson (Secretary), J. A.
New, Dr. R. MacKendrick (Chairman), T. J.
Miller.

Manufacturing Department

CALGARY REFINERY

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Fast, James Kirkland, A. Anderson, F. C.
Temple, D. M.
Alton, Jr. Second row, left to right—E. J.
Gardner, A. C.
Harper, C. M.
Horse (Chairman), W. W.
Connelly, E. D.
O'Donnell. Bottom row, left to right—E. McDade, L. E.
Hovell, J. J.
Hawes, E. S. Mulcahy, E. J.
Gardner, Jr., J.
McClure.

HALIFAX REFINERY

Top row, left to right—W. S. Selle, G. O.
Perrie, H. O.
Stevens, K. J. Donohue (Chairman), L. J.
Jones, J. E.
Remenda, S. A.
L. Stelke. Center row, left to right—F. G.
Fleury, J. K. B. O'Neill, J. E.
McFetridge. Bottom row, left to right—R. P.
McIntyre, W. E.
McIntyre, A. E.
Gruys, Alex. Hit, A. J.
Babine, S. L.
Anderson, A. M.
Gohain.

SARNA REFINERY

Top row, left to right—George Bedin, C. H.
Putter, H. L.
Best, W. M.
Brown, J. F. R. Mazzell, W. L.
Humphreys, F. D.
Child, H. H. Clark, J. A.
O'Meara. Second row, left to right—M.
Hutchins, W. B. Brown, S. G.
Walker, J. A. Bell, W. W.
McIntyre, Les.
Kiley, D. Hopper, H. W.
Kent. Third row, left to right—W.
Robinson, C. L.
Cookson, J. W.
McDonald, J. O.
Brodie, C. E.
Cosco (Chairman), E. E.
Dobson, E. C.
Cline. Fourth row, left to right—S.
Wright, T. Seavers, H. Wright, J.
O'Meara. Bottom row, left to right—O.
Peck, C. J.
Roue, A. V.
Hawkins.

REGINA REFINERY (Left)

Upper left—H. Beaucage. Upper right—J. A.
Galpin. Second row, left to right—J. H.
Kemp, J. J.
McPherson, E. E.
McGill, J. A.
McKee, W. E.
O'Neil, J. E.
McKee, G. W.
Wright, C. H.
Kimbell (Chairman), G. S.
Kent, W. O.
Lepage. Bottom row, left to right—E.
Stott, S. G.
Owen, G. H.
Lucas, H. L.
Gow. Lower left—T. Robertson. Lower right—G. T.
Barlow.

Ioco Refinery (Above)

Top row, left to right—George Bedin, C. H.
Putter, H. L.
Best, W. M.
Brown, J. F. R. Mazzell, W. L.
Humphreys, F. D.
Child, H. H. Clark, J. A.
O'Meara. Second row, left to right—M.
Hutchins, W. B. Brown, S. G.
Walker, J. A. Bell, W. W.
McIntyre, Les.
Kiley, D. Hopper, H. W.
Kent. Third row, left to right—W.
Robinson, C. L.
Cookson, J. W.
McDonald, J. O.
Brodie, C. E.
Cosco (Chairman), E. E.
Dobson, E. C.
Cline. Fourth row, left to right—S.
Wright, T. Seavers, H. Wright, J.
O'Meara. Bottom row, left to right—O.
Peck, C. J.
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18
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