REVIEW PAPERS

(Papers appearing in this section are invited reviews of subjects of wide current interest.)

FUELING A GLOBAL WAR

AN ADVENTURE IN STATECRAFT

MAX W. BALL,
Petroleum Geologist, Special Assistant to Deputy Petroleum Administrator,
Petroleum Administration for War,
Washington 25, D. C.

My story is a story of the American spirit in action. My theme is a unique adventure in statecraft. My example is a form of government-industry cooperation that has made possible the impossible. Specifically, my example is the fueling and lubricating of the greatest armament the world has ever seen: more planes than ever before swept the skies; more vehicles and armor than ever before roamed the land; more ships than ever before ploughed the seas; more landing craft than ever crawled ashore. The story is one of grueling effort and hard-won success; of achievement through a new form of industry-government teamwork.

THE VITAL MUNITION

Napoleon once remarked that "an army marches on its stomach." Today an army marches—and a navy sails and an airplane flies—on its fuel tanks. More than 65 per cent of all the tonnage shipped overseas is liquid fuel—gasoline, diesel fuel, and fuel oil. Think that over for a moment: The oil required to fuel and support our armament is nearly double the tonnage of the armament itself, the shells and cartridges for the guns, the food, shelter, medical supplies, and creature comforts for the men, the repair parts and replacements for the equipment, and all other supplies.

ARMAMENT WITHOUT OIL

What good would all our armament be without fuel and lubricants? None whatever. Deprived of mobility it would be just so much scrap, useful only on the salvage dump. Without gasoline, a fair-grounds balloon is better than an airplane, and a bicycle than the fleetest staff car built. Without fuel oil a Chinese junk is a better craft than the mightiest battleship. Without lubricants, no plane or gun or tank or car or ship could move through even the shortest campaign. Equipment without fuel and lubricants is as bad as a rifle without cartridges; a good stout club is a better weapon.

MILITARY USE

I am not free to give you figures on the total quantities of the various oil products required, but I can give you a few comparisons, from which you can do your own addition and multiplication. A tank car load of gasoline would have

1 John Adams Bownocker Memorial Lecture given January 16, 1945, through cooperation of the Bownocker Fund, Department of Geology, the Ohio State University, and the Ohio State Chapter of the Society of Sigma Xi.
fill the ordinary civilian’s car for nearly 14 peacetime years, but it will fill the
tanks of a B-29 only once. Aviation gasoline consumption has increased by more
than 1,000 per cent since Pearl Harbor.

Present aviation gasoline requirements for our air forces are 14 times
the total gasoline for all purposes shipped to Europe at the height of the last war.
Our air forces alone are using more gasoline per day than all the trucks
and buses in the United States. If these are the requirements of the air, try to
calculate the gasoline and diesel fuel consumed by ground equipment—tanks,
trucks, tractors, guns, armored cars, jeeps, and all the rest—in western Europe
alone. Then add Italy and the Pacific area and the rest of the fronts, and the
supply areas back of the fronts. The Navy, which operates on the sea, has more
than 140,000 vehicles operating on land. Try to imagine, then, how many the
Army must have! When that gets beyond your grasp, stupefy your imagination
by thinking how much fuel oil is consumed by the ships of the Navy, Coast Guard,
and the merchant fleet, operating on the seven seas. It is greater than the entire
marine fuel consumption of the world a few short years ago.

At every beat of your heart enough oil goes overseas to run a car from Fair-
banks, Alaska, across Canada, the United States, and Mexico nearly to Central
America. Military use and overseas shipments in 1944 would have buried the
whole of Manhattan Island under nearly four feet of oil.

ESSENTIAL DOMESTIC USE

Then, when you think you have an adequate conception of overseas and offshore
requirements, add essential domestic consumption. War plants and plants
making essential goods must run; many of them run on fuel oil or natural gas;
all of them require lubricants. Houses and offices and apartment buildings and
hotels must be heated; many of them are equipped to burn nothing but oil, and
no other equipment can be had. Unless farm tractors and trucks were supplied
with gas and oil the production of food would decrease alarmingly. Diesel and
oil-burning locomotives must run; otherwise the railroads would face an even
greater problem than they do. Unless cross-country buses and trucks can run,
the task of the railroads would become impossible and many communities would
be marooned without transportation. Unless urban buses and trucks can run,
workers could not get to and from their jobs, food and supplies could not be dis-
tributed, and the productive activities of our cities would soon be demoralized.
Without gasoline hundreds of thousands of workers could not get to their jobs
and thousands of executives and professional men could not go about their necessary
businesses. Even the ordinary civilian needs to drive a few miles now and then;
his pattern of living was designed on gasoline.

Rationing of gasoline and fuel oil, conversion to other fuels and other con-
servation measures have somewhat curtailed civilian consumption—otherwise
military demands could not have been met—but the curtailment has been largely
offset by the needs of a vastly expanded war industry. Civilian consumption
is considerably below its volume before Pearl Harbor, but is still about two and
a half times military consumption. In an industrialized nation, the home front
requires even more oil than the fighting fronts.

ALLIED AND NEUTRAL NATIONS

That still is not all. We are not fighting this war alone, thank God, on either
the fighting or the production fronts. The armies, the navies, and the air forces
of our fighting allies must be supplied with fuel. Their industries and their
essential civilian uses must be supplied as well. The civilian economies of liberated
areas must be restored as rapidly as possible, for military and productive as well
as humanitarian reasons, and oil products bear a large part in the restoration.

It should be said, in passing, that the civilian economies of our allies and of
neutral and liberated nations have not been supplied with anything like the generosity accorded to our own. It has been years since an English civilian, for example, could drive his car to market for the week’s groceries or meet a baggage-laden friend at the station.

Except for Russia, most of these oil products must perforce come from the United States. The fields of Latin America and the Middle East are being utilized to the limit of available refining and transportation facilities. Their facilities and output have been and are being expanded as rapidly as time, distance, and availability of materials permit; faster, proportionately, than those in this country. Nevertheless, the producing and refining facilities of the United States must still carry most of the burden. To our own military and domestic consumption, then, must be added a good share of the military and essential civilian consumption of the allied, neutral, and liberated countries.

THE MULTITUDE OF PRODUCTS

The staggering quantities are only half the story. The job is as complex as it is stupendous. Jeeps won’t run on diesel fuel or tanks on heavy fuel oil or battleships on gasoline. Planes would be sitting ducks for the enemy if fueled with motor gasoline. Carriers and PT boats don’t use the same fuel. The oil that heats an apartment house would not run your car or fuel an industrial plant. Diesel trucks and buses can’t use gasoline, and the fuel for diesel locomotives differs from that for diesel trucks and buses. As for lubricants, their variety is bewildering. Motor oil for jeeps won’t do for the engines in a carrier. The turbines in a battleship require different lubricants than the generators or the gun turrets or the recoil mechanisms or the ammunition hoists. A B-29 uses 26 different oil products and derivatives. The number of different oil products used in essential industries is too great to enumerate.

Someone has said that winning a war is a matter of having enough of the right things at the right places at the right time, but enough oil to the right place at the right time is no good unless the oil is of the right kind. Each petroleum product, whether aviation gasoline, heavy fuel oil, Arctic motor oil, or axle grease, must be tailor-made for its particular use; it must be made in the right quantities; and it must be where it is needed, when it is needed. Time, place, quantity, and kind are the essential elements.

CRUDE OILS AND REFINERIES

Can you visualize the job of meeting these requirements? There are almost as many different kinds of crude oil as there are major oil fields. Some crudes are well adapted to making aviation fuel, some are not. Some are high in total gasoline yield, some are low. Some yield excellent lubricants, others do not. Some make more and better diesel fuel than others. Some are most notable for their heavy fuel oil yields.

Moreover, no crude oil is converted wholly into a single product such as gasoline or fuel oil or lubricants. Every crude yields from a half dozen to a half hundred or more products, the number, quantity, and quality of each depending partly on the character of the crude and partly on the refining processes to which it is subjected.

These refining processes are in themselves numerous and complex, and the units in which they are carried out are adapted to only one general type of operation. Refinery equipment is not ordered out of stock in standard shapes and sizes. Each piece is individually designed and built to produce certain products out of a certain raw material. A plant built to make maximum motor gasoline from East Texas crude cannot be converted overnight to make maximum lubricating stock from Gulf Coast crude; a large part of it would have to be redesigned and rebuilt, and after the change was made its secondary products—furnace oil, diesel
fuel, heavy fuels, and the rest—might be entirely different from what it made before.

Every one of the secondary products from every plant is important, for the secondary product of a plant is the primary fuel or lubricant in some specific use. It follows that if the right product is to be at the right place at the right time in the right quantity, the right crude must be processed in the right refinery, far enough in advance to permit delivery where needed when needed.

To produce the crude oil in the respective fields, get each grade to the refineries best fitted to use it, make the needed products, and distribute the products to the points of use requires a far-flung inter-related system of wells, refineries, pipe lines, tankers, tank barges, tank cars, tank trucks, terminals, ports, and loading facilities, each part of which must be correlated with the rest of the system. Supplying the world with oil, even in peace time, is a complex business.

WARTIME COMPLICATIONS

Into this already complex business the war has introduced endless new complications. Millions of barrels of new products have been required, specifications for old products have been changed, increased yields of some products have been demanded and decreased yields of others, and the relative demand for each product has changed from month to month. The needs of individual refineries for crudes of particular characteristics have shifted. The supply of some crudes has diminished and of others has increased.

Many tankers depended on to carry crude from the fields to the refineries have been sunk by the enemy or diverted to carrying products overseas. Overland transportation by pipe line, tank car, tank truck, and barge has had to replace coastwise and lake shipping. New pipe lines have had to be built and old ones relaid or reversed. Terminal and loading facilities have had to be pooled. The entire oil transportation system east of the Rockies has had to be revamped, one of the most intricate transportation systems in the world, built up through more than 50 years of trial and error.

Shortages of materials and men have imposed further difficulties. The oil business uses huge tonnages of steel, copper, lead, and other metals, great quantities of chemicals, thousands of specialized geologists, chemists, and engineers, and hundreds of thousands of highly-skilled workmen.

Called on for a great expansion of output, it would normally have increased its use of both materials and men. Yet both materials and men have been needed by the armed services and by other essential industries. Greatly increased output of petroleum products has therefore had to be achieved with a decreased amount of materials and fewer men. Fueling and lubricating a global war wouldn't be half so tough if it didn't have to be done in wartime.

ONLY THE INDUSTRY COULD DO IT

Have I succeeded in giving you a conception of the magnitude and complexity of the job? Five years ago almost any oil man would have declared the task impossible. No informed person who could have foreseen the needs would have believed that the petroleum industry could supply them. Yet the petroleum industry is doing it. No one else could possibly do it. Only an industry with a pre-war total initial investment of 15 billion dollars, the second largest industry in the United States, could think of doing it. Before the war the industry was accustomed to producing and refining upwards of three million barrels of oil per day, and delivering the products to cross roads and main street intersections, from coast to coast and border to border. Only an industry with the competence, the technical skill, the adaptability, and the ingenuity to carry on such far-flung, complex, and constantly changing operations as a daily routine—only such an industry would have known how to start. That fact is obvious. A second fact...
is almost as obvious: Although the industry alone could do the job, it could not do the job alone, for a number of reasons. In the first place, it lacked the necessary coherence and centralization; it was too competitive.

THE COMPETITIVE SPIRIT

Those of you who still think of the oil business as a monopoly, an octopus with one head and many tentacles, are about thirty years behind the times. Those filling stations at cross roads and street intersections cost money, plenty of money. Would a monopoly have built them to get your business? A monopoly would get your business without such expenditures; you might not like to go five miles instead of five blocks to get your gasoline, but you would do it—and use more gasoline in the doing. Would a monopoly have cut the price of tax-free gasoline in two from 1920 to 1938? The oil business did. Would a monopoly have increased the average octane rating of your gasoline by 10 points in the same period while it was cutting the price in half? The oil business did. The idea that the oil business is a monopoly is as out of date as button shoes and hobble skirts.

Those filling stations, the improved quality represented by those extra octane numbers, and those price cuts have come about because thousands of producers, refiners, and marketers, big and little, are each trying to get more business and keep it. The oil man’s creed about additional business is simple: Find it, create it, develop it, or take it, but get it. An oil man scarcely dares to take a nap, lest some competitor discover a new field or develop a new process or tie up a market that he could have had if he had stayed awake. If there is an industry more competitive than the oil business, count me out of it.

Now all this competition is a grand thing in time of peace. It means higher quality, lower prices, better service, millions of dollars a year spent in research, technologic advancement so rapid that a plant may be obsolete by the time it is completed, all of which redounds to the public good. It may also be a grand thing in time of war, provided that competitive practices do not interfere with a coherent, unified, one-for-all effort to do an all-out emergency job.

Unfortunately, some competitive patterns do just that. A producer who has a surplus of drilling rigs doesn’t ordinarily turn them over to his neighbor who may have none, yet it may be important to the war effort that the neighbor’s lease be drilled. A refiner who has contracted for a crude supply doesn’t normally divert part to his competitor, even though the competitor’s plant might make more 100-octane gasoline from it. A marketer with excess terminal capacity doesn’t usually invite his competitors to use the excess. A company that has spent a million dollars developing a process to make better gasoline at lower cost isn’t likely to throw it open for the world to use. Yet some of these things were bound to be necessary. Could and would oil men forego competitive practices so far as required for the common good?

GUIDANCE AND PROTECTION NECESSARY

Suppose they did? Suppose that every man in the oil business could lay his ingrained competitive instincts completely on the altar of the war effort, who would tell him how to make his sacrifice, where his tools or his crude oil were most urgently needed, what competitors would make the best use of his processes or his excess facilities? Who would tell him how much to give and to whom? Most important of all, who would protect him from fine and imprisonment for doing things that in war are called cooperation but in peace are called collusion? Oil men hesitate to lunch with a competitor, for fear of an anti-trust investigation. Moreover, who would protect the industry from its own sharp-shooters, those who might refuse to cooperate, who might knife a competitor behind the screen of war activity? Such sharpshooters would be few and under normal conditions unimportant, but one small monkey wrench can wreck a big machine, when the machine is running at the speed the oil industry would have to maintain.
WHO WOULD PLAN AND PROGRAM

Second, if the industry were to attempt the job alone, who would plan and program it? Who would coordinate the productive efforts of thousands of producing, refining, transportation, and marketing companies to meet the needs of a dozen armed services and a score of civilian economies? Who would analyze and predict the needs of our own armed services, merchant marine, and civilian economy, those of our allies, and the civilian economies of the neutral and liberated countries? Who, when such a program of needs had been drawn for as far ahead as might be, would determine how much of which product should come from where, in order that the needs might be met?

If the tremendous needs of the war were to be met with the limited materials and men available, the output of every well, every natural gasoline plant, every refinery and every unit in every refinery, would have to go to the plant, the port, or the consumer where it would do the most good. The transportation of every barrel would have to be planned so that tanker space, always in short supply and subject to enemy action, might be utilized to the best advantage and wherever possible be replaced by overland transportation. To save transportation, supplies for each point of use should be lifted from the nearest available source, a matter that in itself would require far-sighted programming.

Such planning must not only cut across all competitive lines, it must be world-wide in its scope, cutting across all international boundaries. Here clearly was a task beyond the capacities of a vast but competitive industry.

WHO WOULD DEAL WITH FOREIGN POWERS

Even though the industry could legally achieve a degree of unity enabling it to disregard competitive boundaries, it could not without governmental powers disregard international boundaries. Only an agency of government could deal with allied and neutral governments, gathering the information, conducting the negotiations, and doing, with them, the world-wide planning necessary to success.

WHO WOULD DEAL WITH DOMESTIC AGENCIES

Who, for that matter, would deal with the numerous agencies of our own government that in wartime perforce have some connection with the oil effort? There are thirty to forty of them—I have not taken time to count them—including the Geological Survey, the Bureau of Mines, various bureaus of the Treasury Department, the Department of Justice, the Interstate Commerce Commission, the Office of Defense Transportation, Defense Plant Corporation, Defense Supplies Corporation, the War Manpower Commission, the Office of Price Administration, the War Production Board, and a host of others. With the necessary wartime concern of these agencies in his business, an oil man would almost have to spend his full time in Washington, with a retinue of guides and special representatives, if he had to deal directly with all of them.

If his war effort were to be effective, there must be an agency with which he could deal, and with which alone he need deal except as it took him to other agencies.

WHO WOULD OBTAIN THE MATERIALS

Finally, in wartime Washington with its vital control over vital materials, who would get the industry the materials for its wartime needs?

The industry requires iron and steel and copper in large quantities. It requires pipe and pumps and valves and compressors and engines and trucks and instruments. It requires tires and hose and rubber tubing. It cannot function without tankers and tank cars and tank barges and tank trucks. It uses chemicals and lots of them. It requires a hundred other things. The oil business is not only a huge producer; it is also a voracious consumer. How, in an ever-tightening market, would it get the diet of materials it would have to have?
Most of the materials were in limited supply. Already the government had set up agencies to apportion the available quantities where they would do the most good. If a half million producers and refiners and distributors should descend upon the agencies, each clamoring for what he wanted, would each of them get what he should have and only what he should have for his war effort? Would the industry as a whole get what it should have? Would the limited supply that could be allocated to the oil business be placed where it was most urgently needed? Obviously not. Someone who knew the problems and the needs of the business as a whole would have to screen and consolidate the applications, then press the industry's claim for enough materials for its job, and then see that they were efficiently used where they would do the most wartime good. There would have to be what Washington has come to call a "claimant agency."

THE GOVERNMENT MUST PROVIDE AN AGENCY

No, the industry as such could not do the war job alone; there must be an agency to guide, coordinate, and where necessary direct the effort, to represent the war-conceived necessities of the industry, to deal with foreign governments, and, in conjunction with them, to plan the worldwide program that the industry would carry out. The government itself, through an agency created for the purpose, must guide, coordinate, direct, and represent.

Thus, inescapably, the Office of Petroleum Coordinator was established on May 28, 1941, with Secretary of the Interior Ickes as Coordinator, and on December 2, 1942, this was changed to the present Petroleum Administration for War, PAW for short, with Mr. Ickes as Administrator.

OPERATION OR COOPERATION

At the outset, a vital decision had to be made: Should the government take over and operate the industry? There were men who thought that only through government operation could competition be subdued into cooperation, could the know-how of the industry and the authority of the government be brought together. There were men who believed in government ownership in peace as well as war, and who thought this an opportunity that should not be missed. There may even have been men—little men—whose fingers itched for the giant authority that government operation might give them. Advocates of government operation were not wanting.

Mr. Ickes, however, had a greater vision, a plan by which the industry and the government should go to work together. The tremendous strength of the industry, the vigor and virility bred into it by competition, should be kept unimpaired and be utilized to the full in the mightiest war effort man had ever seen. From the industry's great store of talent should be drawn in large part the government organization to aid and guide and administer the effort. Teamwork between the two should be assured by industry committees working intimately with the administrative units. Thus closely integrated, each doing the part that it alone could do, industry and government would do the job together. Whether we may think as much of Mr. Ickes as Mr. Roosevelt has shown that he does, or as little as Mr. Dewey, for example, has said that he does, one fact is clear: his handling of the oil situation during the war has been that of a great statesman.

STAFFING THE AGENCY

His first act was to pick as Deputy Petroleum Administrator, to run the job, an outstanding oil company executive, the type who combines administrative force with vision and public spirit, Ralph K. Davies, executive vice-president of Standard of California.

Some men would have been hesitant lest they be accused of favoritism or would have been fearful that oil men might grind private axes in public positions.
Mr. Ickes had more faith in human nature. He encouraged Mr. Davies to staff from top to bottom with men who knew oil and the oil business, drawn chiefly from the industry, with a leaven of such men from government technical bureaus, state agencies, and educational institutions as were qualified and available.

To assure breadth of knowledge and balanced point of view, the men were drawn from all branches and phases of the industry, from such related industries as the construction and supply companies, from all parts of the country, and from big and little companies alike. The great major companies and the small but vital independents were evenly represented so far as possible. For fairness and impartiality, reliance was placed on the integrity and patriotism of the men selected and their diversity of background. No man passes on any matter that deals with the company with which he was formerly connected. If anyone did attempt to favor a former affiliation, it would most certainly be caught by some one of the other men through whose hands it must pass, men with different former affiliations. These precautions have proved notably unnecessary. An able and unselfish executive who spent three years in PAW, and left recently to go back to the industry, remarked on leaving that he had not seen a single attempt by any PAW man to favor his former company. After all, these are high-type men; such men are prone to intensive singleness of purpose; and the purpose of all of them is to win the war.

POLITICS AND ECONOMICS

Political affiliation and economic views, likewise, were to be neither asked nor considered in staffing the organization; men were to be selected for their knowledge and ability, not their politics.

I have spoken in the past tense, but what was true at the start is true today. I am a newcomer in the organization. I doubt that Mr. Ickes agrees with some of my published views on planned economy, but that did not prevent my being drafted for service. No one has asked me whether, in the last four presidential elections, I have voted for one man or for four; so far as PAW is concerned, no one cares. Almost any day, in the executives' lunch room, you can hear a rampant Republican, or a half dozen, staging an argument with some equally rampant New Dealer, openly and fearlessly, or a disciple of Adam Smith battling with a disciple of Stuart Chase. But the politics and the economic theories are left in the lunch room, along with the tips and the paper napkins. They have no part in what goes on in the offices upstairs.

THE TEAM-WORK IDEA

Mr. Ickes' next step, after appointing Mr. Davies, was to call representatives of the industry together and explain his plan and his purpose. He emphasized that the spirit of both plan and purpose was cooperation rather than coercion. The oil men listened politely, then went home to tidy up their bomb-proof shelters. These men, you must remember, had been listening for ten years to proposals from Washington, ranging from making the oil business a public utility to expropriating it. Small wonder that they were skeptical.

Skepticism lessened, however, when the plan began to function, and the industry discovered that it was a full-time working partner, participating fully in the partnership business and in the partnership councils.

CONTACT WITH THE INDUSTRY

One of the first things to reassure it was the dispersion of the organization into intimate contact with the industry, instead of its concentration in cloistered halls in Washington. Mr. Davies decentralized his staff; got as many of his men as practicable out into district offices, where the derricks and refineries and bulk stations are. An oil operator no longer had to go to Washington to present his needs or views; consideration was given on the spot by men trained in the
operator's special branch or function of the industry. Each district office had a staff trained in each function of the business: production, natural gas and natural gasoline, refining, transportation, and distribution.

In Washington each function of the business was represented by a division headed and staffed by specialists in that function. The staff included men with established reputations as geologists, drillers, production engineers, field superintendents, pipe line builders and operators, refinery engineers, chemists, refinery superintendents, research men, sales managers, traffic men, station managers, economists, lawyers, accountants, and all the other specialties that go to make up the vast and complex organism of the oil business. The industry found its needs and its problems in the hands of men who knew them and whom the industry knew.

KEEPING THE COOPERATIVE ATTITUDE

Even an organization drawn largely from the industry, however, might lose the cooperative touch if allowed to set itself apart. The possession of authority is a great temptation to use it unsparingly. Coercion is often simpler than cooperation. Arbitrary decisions are more quickly and easily reached than joint decisions. Autocracy, on the surface, looks more efficient than democracy. Men might be pardoned for thinking the fastest and cheapest way to get the job done would be for PAW to decide what the industry needed, tell the industry what to do, and let the industry then go and do it.

To their credit be it said that few men in PAW were inclined to this easy but dangerous fallacy, and they were soon set right. The men at the top knew better; so did virtually all the men in the ranks. The job was too big to be directed by a few men temporarily vested with authority. The problems of the war effort were too great to be analyzed and solved, unaided, by a government agency.

The key lay in working together. PAW must not become the autocrat, industry the menial. The relationship should always be one of partnership.

How establish and maintain that relationship? How counteract the natural tendency of government bureaus to become autocratic, and of industry to look with hostility on government guidance? How make the effort a joint effort, putting behind it all the brains and vigor of the industry, all the power and knowledge of the government? Mr. Ickes and Mr. Davies had the answer; the right answer, as time has proved.

THE INDUSTRY COMMITTEES

In each of PAW'S districts industry committees were formed, one for each functional division of the industry: production, natural gas and natural gasoline, refining, supply and transportation, distribution and marketing. These committees work with the corresponding PAW functional directors, district and national; the production committee, for example, with the district and national directors of production. The chairmen of the five functional committees, with a chairman chosen for his grasp of all the functions in the district, constitute a district general committee, working with PAW on matters affecting all branches of the business in the district. Both the general and the functional committees may have special committees and subcommittees performing specific duties or dealing with special problems, such as committees on manpower, construction, materials, technical data, research, and the like; whatever needs to be covered, these district committees cover. Most of them have paid staffs; some of them have full-time executives. They bear all the costs of their own work, and a great many of the members give more time to their committee work than to their company duties.

Note how these committees differ from the industry advisory committees attached to so many government bodies. They are not window dressing, existing to give occasional advice and to create an illusion of cooperation. They are
working bodies. They are advisory in the sense that they have no power to issue orders, but it is a rare district order that is not in accord with their judgment. They supply most of the facts on which action is based. If more facts are needed, they find them and analyze them. On the one hand they recommend actions to be taken; on the other they explain to their associates in industry the reasons for the actions. They work out solutions to the multitude of problems that arise. They carry out approved programs. Many of the ablest executives in the oil business serve on these committees, and some of them have given their full time to the administration of programs of particular difficulty, programs that averted disaster through their patriotic efforts.

These committees are a far cry from the purely advisory committees of other days and other agencies, useful as some of them may have been.

SELECTING THE COMMITTEES

How were the committees selected? Mr. Ickes and Mr. Davies asked the industry to submit nominations. Anyone in or connected with the industry could submit as many names as he chose. The industry responded with thousands of nominations, naming several hundred men. From these the committees were appointed, care being taken that on each should be balanced representation between the major and the independent companies, big and little, and that all points of view should be represented.

As thus constituted the committees represent an impartial working cross-section of the best talent in each district.

More than 1,000 men serve on these committees; 1,000 picked men of the industry, whose willing services could not be had in any other way.

THE PETROLEUM INDUSTRY WAR COUNCIL

The cooperation I have so far described is at the district level, but the plan does not stop there; it extends to the top. The industry body which deals with matters of national scope, and through which the industry's entire effort is unified, is the Petroleum Industry War Council, PIWC for short, made up of 78 top-flight industry executives.

The Council is composed of, first, the chairmen of the district general and functional committees; second, the heads of the nineteen trade associations in or dependent on the industry; third, outstanding company executives, both major and independent, who happen not to be included in one of the other categories; and fourth, ex-officio, the chairman of the Foreign Operations Committee, of which more anon.

The Council too has its committees, a long list of them, covering the same functional activities as the district functional committees and a number of other things such as conservation, economics, renegotiation, disposition of government-financed facilities, and national oil policy. These committees draw upon the entire knowledge of the industry as well as the knowledge of PIWC, they confer with the appropriate PIWC divisions, and they report to the Council or to PIWC through the Council.

The Council meets regularly with the chief executives of PIWC, and at these meetings all the major problems and policies of the worldwide oil situation are on the table. The Council, working with the executives of PIWC, is the powerhouse of industry-government cooperation.

GLOBAL ATTENTION

Notice that phrase, "the worldwide oil situation." The functions of PIWC do not stop at the water's edge; the cooperation of the industry is not circumscribed by our national boundaries. Every gallon of petroleum products produced or used by the United Nations anywhere in the world is within the sphere of interest and activity.
PAW’s studies of problems and supplies outside the United States are carried out by three foreign divisions headquartered in Washington, devoted respectively to foreign production, foreign refining, and foreign supply and distribution. The corresponding industry body is the Foreign Operations Committee.

The Foreign Operations Committee is to the foreign situation what the Petroleum Industry War Council is to the domestic situation. It too has numerous committees, functional and geographic, working on every phase of foreign production, refining, transportation, and distribution, as intensively and devotedly as the committees working on domestic problems.

PAW’s foreign divisions also cooperate closely with foreign governments and with agencies of our government concerned in foreign affairs, particularly, as to the latter, with the State Department, the Foreign Economic Administration, and the armed services. Great Britain is represented in Washington by a British Petroleum Representative. Without whole-hearted British cooperation much of the effectiveness of the worldwide effort would have been lost. Canada’s Oil Controller has a representative in the PAW building. Other governments either have oil representatives in Washington or keep in touch through their embassy staffs or their home offices.

Thus the world is covered, and many interesting as well as important things are given attention: Facilities for making 100-octane gasoline in the Dutch West Indies or on the Persian Gulf; multiplying the amount of oil coming out of the Caribbean region; providing additional refining facilities for Russia and for Saudi Arabia; possible utilization of liberated refineries that the Germans left too fast to wreck—these are samples of the things considered. The petroleum problems of a global war are studied under a global microscope and solved by global cooperation.

**HOW IT WORKS**

If all this seems complex and confusing it is only because the business to be done is of infinite variety. In practice the operation is direct and efficient. Let’s take an illustration, hypothetical and simpler than most problems:

One fine morning the Army calls up PAW and says that after a certain date it will need an increased monthly supply of a certain special lubricant. The directors of PAW’s divisions of production, refining, supply and transportation, distribution, materials, and program get together and if necessary get in touch with their respective district directors and the industry committees concerned. The matter may be taken up in the domestic operating committee, for consideration whether the demand can be met by decreasing some civilian use, whether transportation can be made available to deliver the product where the Army wants it, whether the program for other products would be thrown out of gear. The foreign divisions may be consulted to see whether an overseas source, closer to the point of use, could be developed. At length, and more quickly than you might think, a decision is reached that the special oil can best be made, with minimum disturbance of the output of other essential products, by Gulf Coast refineries using a certain grade of Texas crude. The directors of production and refining notify their respective district directors at Houston. The district director of refining lays the problem before the district refining committee and together they decide that plants A, B, and C at Houston and Beaumont can best do the job. After consulting with the plant managements they find that plants B and C will need certain additional equipment and half a dozen skilled men to install it, and that the new installation at plant B will have to be financed by the government. The plants prepare for the necessary change-over and the district office informs Washington of the materials, manpower, and money needed.

Meanwhile the district director of production has met with the district production committee and arrangements have been made for the diversion to plants A, B, and C of the necessary supply of the desired grade of crude. He too reports his results to Washington.
In Washington the request for materials, men, and money gets immediate attention. The director of the materials division, after studying his own files and perhaps those of two or three other government agencies, and discussing the matter with the PAW construction officer, decides that plants M and N at Pittsburgh and Gary can supply the requisite sheets and shapes of special steel, and that plants X and Y at Marietta and Terre Haute can fabricate them into the necessary pressure stills without undue delay to other urgent war orders. Then he asks the War Production Board to allocate the necessary critical materials. With the support of the Army, he convinces them that the need is great enough to warrant the allocation, even though the materials must be taken from the tank or some other urgent program.

The critical materials are allocated and the production and fabrication of the steel are given a high priority, high enough to insure plants M, N, X, and Y of being able to make delivery in time. The director of materials sees that the orders are placed and manufacture started. Then his men keep a constant check on the plants until the orders are completed and shipped, and he keeps plants B and C informed of progress.

While thus engaged the director of refining has taken up the matter of financing plant B with Defense Plant Corporation, a thorough check has been made of the need and the security, and DPC has agreed to loan the plant the money needed.

Meanwhile PAW’s labor counselor has gone to work to get those six needed skilled workmen. He and the manpower committee in Houston may try to borrow men from other refineries. They may confer with everybody from the War Manpower Commission in Washington and its Regional Director in Dallas clear down to half a dozen local draft boards. They may get an improved labor priority, arrange for stationing recruiters in favorable employment offices, or even get the War Labor Board to grant a wage adjustment. By one means or another they get the required men.

Eventually the materials arrive and the men go to work. The district refining and manpower committees and the district directors keep in constant touch with the work, check the technique of the installation, try to keep the men on the job and working at what should be wartime speed, and hasten progress in every way they can. When operations start, they check and advise until the new unit is in production.

By the day appointed, the Army begins to receive its increase of the special lubricant. A job has been done, and if you think that it took some doing, you should follow some of the tough ones!

Note the part borne throughout by the industry committees. Only in obtaining the allocation of materials and money was PAW forced to travel alone. In everything else, from the first to the final operation, PAW and industry committees worked side by side to get the job done.

MONETARY VALUE OF COOPERATION

The services of the men who serve on the industry bodies and the men who serve under them in industry capacities are beyond price. Think what an army of government men would be required to do the same job. The oil fields and refining centers and shipping terminals would be crawling with them. If they were to be competent they would have to be taken from the industry—there would be no other source—which would leave the industry helpless.

Their value can not be measured in money, but what they save the government in dollars and cents alone should bring prayers of thanksgiving from the taxpayers.

BATTLES OF THE COUNCIL CHAMBER

Has the cooperation between the government and the industry always been conducted in a roseate glow of sweetness and light? Not by a couple of thousand
light years. Successful oil men are forceful individuals, with strong wills and strong opinions. Some are even gifted with strong language. They do not leave these assets at home when they accept service with PAW or on an industry committee.

Not all the pitched battles of the war have been in Europe or Africa or the Pacific area; some have been fought in Petroleum Industry War Council meetings with PAW. Some pretty stiff engagements have taken place in district offices.

These disputes are the exception, not the rule, but they are not to be taken lightly. Some of them have the bite and venom so often characteristic of a family row, and like any other family row they could lead to estrangement and even to divorce. That they have not done so is due to the centripetal force of a common objective: The winning of the war. Oil men, inside the government and out, are bent on victory, and their disputes are always about “how,” not “whether.”

THE PRESERVATION OF THE INDUSTRY

Joint concentration on the main objective is furthered by a common secondary objective, namely, the preservation of the industry. Mr. Ickes and Mr. Davies announced at the outset their determination to keep the industry intact, with its external and internal competitive vigor unimpaired, and to leave it intact and unimpaired when the war is over.

When the leaders of the industry sit in Council with executives of PAW they know they are dealing with men who have the ultimate interests of the industry at heart, men who for the most part came from the industry and expect to return to it and want a healthy industry to return to, but who are determined, nevertheless, that no consideration for the industry or for anyone in it shall interfere with winning the war. On this the industry men are equally determined, first because they are patriotic Americans, and second because, if the war is not won, there will be no free and competitive oil industry. Under such circumstances agreement far outruns disagreement, and performance outruns both.

CASUALTIES OF WAR

The record of maintaining the industry intact has not been perfect. Some producers and refiners and many bulk and filling station operators have been caught by the economic dislocations of the war and been forced to fold up. A few individualists have been unable or unwilling to accommodate themselves to the unavoidable paper-work of a government-guided cooperative effort and have quit in disgust. These casualties must be charged to Hitler and Hirohito, however, and not to Uncle Sam.

Against them may be set those who, but for the efforts of PAW, would have failed through lack of materials or crude or manpower, and those, particularly small refiners, who through government financing, or through diversion of crude to their plants, are stronger now than when the defense program started. If there had been no PAW, the industry’s casualty list would almost certainly have been much longer than it is. And when the war is over the United States will still have a strong and hotly competitive oil industry, made up of majors and independents, little companies and big, in about the same balance as before.

THE THIRD PARTNER

In addition to the government and the industry, there is a third partner in this adventure, the man who owns a car or an oil furnace. His part is to use as little as possible.

How many of us save gasoline by never driving more than 35 miles an hour? How many of us, if we have saved a little gasoline, spend it on a Sunday excursion or a trip to a football game? How many of us make it a point to know a truck driver or station operator who will slip us an extra ten gallons? How many of us
lie to the ration board to get a higher ration rating than we need? How many of us unblushingly buy on the black market? How many of us, in short, make a practice of chiseling on our boys overseas and essential users at home?

Don't misunderstand me when I mention the boys overseas. The five gallons you use for a fishing trip will not come out of their allotment. They'll get what they need if every civilian in the United States has to walk or stay home. But that five gallons may be needed to take some war worker to and from his job, some overworked doctor on his round of calls, some Red Cross worker on an errand of mercy, some public utility service man to stop a house from being flooded with gas or a basement with water. Whatever your wishful-thinking friends may tell you at the club or on the street corner, there is not enough gasoline to go around, and what you use unnecessarily someone else must do without. The public is a necessary participant in this unusual and effective partnership.

A UNIQUE ADVENTURE

There you have it: A unique adventure in statecraft on an unprecedented scale.

Dozens of government agencies, now and in the past, have had their industry advisory committees. Advisory bodies, prompting from the wings but taking no part in the performance, have been a dime a dozen. At the other extreme, totalitarian countries have taken over whole industries or coerced them into doing the will of the State. Even some democratic countries have unified the war effort of an industry by assuming its direction and eliminating its internal competition.

But never before, so far as I know, have a great government and a great industry joined in close, coherent, and yet independent team-work, with the industry directing its own effort, with government aiding, guiding, and directing only where imperative, with every precaution to maintain competitive structure and competitive spirit unimpaired, with freedom of enterprise conserved and utilized instead of suppressed.

Here is something that students of political science may well study, against the day of another emergency which we hope may never come.

A PATTERN FOR PEACE?

Whether there is anywhere within it anything of a pattern for peace I also leave with you to study. Such tentative thoughts as I may express are purely my own, and are strictly unofficial.

My own belief is that when the emergency is over such authority as PAW has, of which it has had to exercise very little, should vanish into the pages of history and PAW with it. In my opinion any form of government control, beyond what policing may be necessary, will lead eventually to that worst of all forms of monopoly, a monopoly controlled by government.

I am opposed with equal vigor to economic planning dominated by government. I fail to see how it can succeed without killing competition, which has brought us, to stick to oil as an example, more gasoline of better quality at half the price in twenty years.

I fail to see, moreover, how it can succeed without going the whole road toward a government-controlled economy, which is to say statism as exemplified in Germany, and every step toward statism is a step away from democracy and freedom.

I wonder, though, whether this adventure in statecraft has not given us a glimpse of another possibility, the possibility of a measure of economic planning by joint industry-government consultation. PAW's experience has taught us that leaders of an industry and government representatives who know their problems can consult together for the common good, and that in such consultations
the industry men, jealous as they may be for their competitive positions, are as responsive as the government men to the needs of the common welfare. Is it impossible that they would be equally far-sighted and public-spirited in time of peace?

Leaders of industry have often suggested that if the anti-trust laws would permit them to get together they could curtail the evils of competition and yet retain its benefits. Perhaps they could, but I doubt that the public is willing to risk that the end would be price fixing and monopoly. It's a risk that I should not care to advocate. But if the government itself were a participant, through men familiar with the industry and sympathetic with its problems, the dangers might be avoided and the benefits gained.

These are tentative thoughts, as I have said; idle speculations to be revived, perhaps, when the emergency is over.

THE JOB GOES ON

But the emergency is not over, and the job goes on. The war demands more fuel and lubricants now than ever before. The industry and the government are determined that the demand shall be met, fully and without stint. They are supremely confident that together they can do it, because they know what they have already done. Only a miracle could have done it, the miracle of a government-industry plan that worked.

Yes, it has worked. In the five and one-third years since Germany marched into Poland:

- Daily crude oil production has been increased by nearly 36 per cent.
- Daily refinery throughput has been increased more than 41 per cent.
- Output of 100-octane aviation fuel has been increased by more than 5,000 per cent.
- Overland transportation to the East Coast, to replace tankers lost or diverted, has been increased by 5,400 per cent.
- The largest crude oil pipe line in the world, 24 inches in diameter and 1,340 miles long, has been completed.
- The largest pipe line in the world for carrying refined products, 20 inches in diameter and 1,475 miles long, has been completed.
- 9,033 miles of other pipe line have been completed, of which 3,150 miles have been dug up and relocated; 3,317 miles have been reversed in carrying direction; and 436 miles of gas line have been converted to oil. Thus a total of 15,600 miles have been put to work to replace tankers sunk or diverted to military use.
- 101,500,000 barrels of oil have been saved by conversion of heating facilities to other fuel.
- Civilian gasoline consumption has been decreased by 161/2 per cent.
- Every overseas military need has been met.
- A minimum of hardship and inconvenience has been visited upon the civilian population.
- The needs of the allied and neutral world have been cared for by an integrated global program.
- Without fail, except for difficulties of Army transport, the right product in the right amount has been at the right place at the right time.

IT COULDN'T BE DONE

It couldn't be done, ladies and gentlemen, and it has been done. Something new in government-industry cooperation has taken place, and the impossible has been made possible. Oil, the most vital munition of them all, is fighting and winning on every front, and a unique adventure in statecraft is succeeding.