The United States of America is blessed with many resources, developed and undeveloped. One of those which is as yet undeveloped is oil shale. Because it is within our borders and so vast, it holds great promise and opportunity, and gives us confidence in our future. But governmentally speaking, the United States of America faces few problems more complex and thorny than those associated with this vast and promising resource.

Reserves

I do not intend to spend much time with the physical aspects of the resource itself. We know much about it and the information is available in convenient form. The oil shale deposits in Colorado, Utah, and Wyoming constitute the world's largest known resource of hydrocarbons. High-grade deposits there are computed at 600 billion barrels. Known world recoverable reserves of petroleum are only about 300 billion barrels.

Competitive economics

The wealth is there, but it is not like the wealth we know to be in the sea. For the technology is present, too. Oil shale helps to heat Leningrad. The Iron Curtain's 1963 production was 55,000 barrels per day. On comparatively low-grade material (15 gallons per ton), Red China produces 33,000 barrels of oil a day from oil shale.

Obviously, the present day economics of petroleum in the free world do not encourage any great effort along such lines.

But the energy demand curve is going up very rapidly, a fact which makes even coal producers optimistic, and which warns against complacency about the adequacy of any given energy source.

Furthermore, since oil shale can be made to yield either oil or gas, its potential market is large, and could be made to supply the bulk of our energy requirements, as for example if war or other emergency should occasion it. At that point, we would be willing to bear the cost, whatever it would amount to, if we had to.

Furthermore, the cost gap is not very wide. One estimate recently made is that high-gravity shale oil from a 25,000 barrel per day plant could be delivered to Los Angeles for $2.00 a barrel, and if production were quintupled, the cost would drop to $1.76. Oil of comparable quality is now selling in Los Angeles for $2.85 a barrel, but comparisons have to be made with prices assumed if controls were relaxed.
Urgency

Do these facts show the problem to be urgent? Two answers can be justified. One would emphasize that the margin between oil from shale and other sources is not likely to be closed for some time, so there is ample time to think the matter out and come to rational, considered, mature judgments.

The other, expressed publicly by the Navy Department, is that oil shale matters must now be handled with a marked sense of urgency. What can be done now, they say, may be too little, and it may already be too late; to continue to await perfection can only, assuredly, multiply the risk of being both too little and too late. The Under Secretary of the Navy, as Acting Secretary, expressed this view last January.

If the Navy says the problem is urgent, I am not inclined to say that it isn't.

But having a sense of urgency doesn't help much, unless there are some clear guidelines about where to start.

History of legal and administrative problems

On the broadest brush stroke basis, it helps to understand that the oil shale problem means many things. To understand it, a little time has to be spent with its history, particularly its history as a legal and administrative problem of the federal government. The ramifications are highly complex. I will be glad to amplify any aspect in which the Committee shows interest.

Public land laws

That oil occurs in oil shale has been known for many decades. Furthermore, since most of the United States oil shale is in public land states, and since the interest in the resource antedated any significant settlement activity, the title and ownership problems revolve around United States land laws, and policies of administering agencies of the federal government.

Oil shale was made a leasable mineral by the Mineral Leasing Act of 1920; before that it was locatable under the general mining laws.

Unpatented claims

Tens of thousands of acres (the estimated number of unpatented oil shale placer mining claims is in the magnitude of 150,000 claims) were staked prior to the enactment of the 1920 measure. Under savings provision of the leasing law these unpatented claims continue to haunt the land administrators. They constitute a major encumbrance on the public lands containing oil shale in the three states of Colorado, Wyoming and Utah.
Simply to determine the status of the records in all the county court houses, apart from on-the-ground surveys, would involve enormous problems, so it is important to note how this situation could continue to exist after 45 years under a law which prescribes leasing as the only avenue for acquisition of rights to remove or develop oil shale.

Section 37 of the Mineral Leasing Act, the savings clause, provided that valid claims existent on the date of enactment and "thereafter maintained in compliance with the laws under which initiated" could be perfected. It was long thought in Interior that this saving clause referred to the continued performance by the locator of the assessment work required on each claim. But in 1935, the United States Supreme Court held this to be erroneous (Ickes v. Virginia Colorado Development Corporation, 295 U.S. 639). Thus it was that the evidence of continued interest, and annual filing of certificates of work performed, evaporated as a convenient basis for clearing the government's title. Whenever interest in oil shale flares up, these old claims come to the fore. This explains why the records have not long since been cleared.

The legal question involved in some 257 claims declared invalid by a Solicitor's decision a year ago (Union Oil Company of California et al., A-29560, of April 17, 1964), and now in court in several cases, is a complex refinement of the effect of the 1935 case on claims theretofore invalidated by Interior under the rules prior to that case.

At this point suffice it to say a substantial fraction of the administrative problems of oil shale revolve around the unpatented mining claims.

If these claims are held invalid, then the land, generally speaking, will take the withdrawn status of E. O. 5327, about which I will say more in a moment.

If they are held valid, then the land will become private land. Roughly a quarter of the total identified oil-shale acreage is now in private ownership. Opportunities for development on these lands is self-evident.

Withdrawal order

Executive Order 5327 was issued on April 15, 1930. Subject to valid existing rights, that order withdrew designated lands containing deposits of oil shale and reserved such shale lands for the purpose of investigation, examination, and classification.

Whether the 1930 order was in furtherance of a far-seeing conservation policy, or a retreat from a vexing administrative problem is open to some question.
Certain it is that in the years prior to 1930, the Department had a bellyful of the problems of oil shale, and a general withdrawal order seems, in retrospect, to have been amply justified on that basis alone.

For example, in 1926, Secretary of the Interior Hubert Work, First Assistant Secretary E. C. Finney (later Solicitor), the Commissioner of the General Land Office, the Director of the Geological Survey, and the Commissioner of Reclamation, personally and jointly held a hearing upon the question of what constitutes a sufficient discovery to support the claim of an oil shale place locator under the general mining laws.

Pre-1930 problems of the Department are detailed in the record made in 1931 by the predecessor of this Committee, the Senate Committee on Public Lands and Surveys, under the Chairmanship of Senator Gerald Nye of North Dakota and presided over by Key Pittman of Nevada. Senate Resolution 379, 71st Congress, recites that "it has been recently charged in the public press upon the authority of a former employee of the Government, ... that considerable areas of public lands, valuable potentially and otherwise because of the oil shales in which they abound, have been improvidently, erroneously, and unlawfully, if not corruptly, transferred to individuals and private corporations, to the great loss to the public." The Committee looked into charges of misapplication of the rule of discovery and other charges, made by one Ralph Kelley, who sold his story to Mr. Pulitzer's New York World.

These rather lurid charges had finally gotten to a certain mining engineer, then President of the United States, who had his Attorney General look into them. I mention the hearings because it shows that immediately prior to the withdrawal, there were extravagant statements of values, and great public interest, considerable indecision about the applicable law, and ample reason for entering a general withdrawal order prior to 1930.

Thus I have now identified two major areas for policy concern—the unpatented claims and the withdrawn status. The first involves all three branches of government, and the withdrawal question involves both the legislative and the executive branch. For Congress, which passed a leasing law for oil shale in 1920, has yet to see that law administered in any respect.

Proposed rule making

Regulations, which were issued under the Mineral Leasing Act, stood dormant in the face of the withdrawal order for many years. Early in 1963, various companies sought rights on the withdrawn lands and filed proposals both under the leasing act and generally. In an effort to bring about a meaningful dialogue about whether sufficient standards were found in the regulations for the issuance of leases, and in an effort to put on the record useful data upon which to determine whether
The withdrawal should be lifted in whole or in part, the Department published in the Federal Register, as proposed rule-making, an order cancelling the existing regulations and calling for public comment as to what should go into new ones. (43 CFR Part 197, Oil Shale Leases, Fed. Reg. 11796, November 5, 1963)

The oil shale leasing sections of the Mineral Leasing Act leaves enormous discretion in the Secretary. He receives in that act no help from the Congress on lease size, save it must be less than 5,120 acres. That much acreage potentially can be staggering in its reserves, where oil shale occurs in great thickness and richness. Royalty rates are not fixed, but may be waived to encourage development, and are subject to readjustment after 20 years. Fifty cents per acre is the annual minimum rental, to be credited to royalties for that year. Not more than one lease can be granted to any one person, association, or corporation; claimants with valid mining claims may relinquish for a preference lease.

In other words, given what we know about oil shale as a resource transcending all other deposits of hydrocarbons now known on earth, it seems to me that a Secretary would want to keep the Congress closely apprised of everything he did in the field. These resources, after all, belong to all the people of the United States.

Still, Congress can be presumed to have intended development, and to be able to expect to have recommendations from the administering agency, if the existing statute is considered insufficient. Thirty-five years is a long time to leave a withdrawal order in effect.

Advisory Board

It was in this climate that the Secretary determined, after reviewing the record made on his request for ideas from would-be lessees, to appoint an advisory board to look into the whole subject.

The oil shale advisory board identified all of the problems I have mentioned so far. But it concentrated its attention on how to stimulate the development of economic recovery processes, and it split sharply on the basic question of the role of the United States in that effort.

The Oil Shale Advisory Board agreed ". . . that the Federal government, working in appropriate cooperation with the States, should move positively but cautiously to encourage private oil shale development, with full protection of the public interest in the broadest sense . . ." The Board suggested objectives of federal policy which emphasized the need for advancement of the technology. The Department of the Interior has encouraged the research and development by which a healthy oil shale industry may be established. The Anvil Points facility at Rifle,
Colorado, has recently been leased by the United States to the Colorado School of Mines for use in industry-sponsored research programs. The Union Oil Company has already in operation experimental facilities for the production and refining of shale oil, and the Oil Shale Corporation is embarking upon a project for further development in this field. In addition, the Bureau of Mines maintains research facilities at Laramie, Wyoming.

Research—in situ

Part of the Advisory Board's concern related to the government's role in research. For my own part, I think research is especially important on the matter of in situ methods. Here I find a basis for a major policy cleavage.

This issue is of great interest to the United States as proprietor, and to the States which have the police power responsibility.

Unquestionably, present projections on the economics of oil shale development are based on conventional mining. For ten years, the Rifle facility devoted considerable effort to mining techniques, coming up with a room and pillar pattern of development, to attain an output of 150 tons per man-shift, for high grade ores in the Mahogany Zone. Open-pit mining, too, has been technologically advanced since the 1950's, and where the overburden is not too thick, perhaps this will be the preferred method.

But these methods, at best, involve the movement of enormous amounts of material, with consequent scarring of the surface.

In situ as a process is not developed. In theory it is entirely practical, but many problems must be solved. Simply stated, it involves drilling a number of holes into the shale formation, establishing communication between holes by fracturing (hydraulically, or by explosion, including nuclear explosives), igniting the oil shale at selected points, and moving the combustion front toward the other holes by injection of air and gas. It is retorting in place. The procedures are not new, but they are essentially untried for oil shale.

Surface disturbance

Naturally, a method of recovery which involves a minimum of disturbance to the surface would be highly desirable.

The Bureau of Land Management particularly has emphasized the need for surface protection measures, for it is its responsibility to lease and concurrently manage the surface resources.
The deleterious effects of excessive surface disturbance and destruction require careful planning. We have the opportunity to do that planning now before the destruction of surface resources becomes a serious problem. This could prevent the recurrence of another Appalachia in the West.

Policy recommendations

The Secretary has not yet determined what recommendations should be made to the Congress, if any, for the resolution of any policy questions prior to the lifting of the withdrawal order. I do not speak for him on it.

Revoke withdrawal?

Legally I think he could lift the order, promulgate regulations, and begin to issue leases. These leases might or might not be "development" leases; clearly under the statute they could contain stringent requirements in the development and surface protection area.

But I also think that no Secretary beginning with Hubert Work right down to the present one can take any more than tiny and tentative steps which have the effect of relinquishing title to this resource without running great risks of misinterpretation. This explains the unyielding posture the government has taken for so many years on the matter of completing action on the unpatented claims, at least in part. It is, in my personal and unofficial view, a question requiring Congressional resolution.

Legislation

This being the case, if it is, it would follow that a lot of subordinate questions could be resolved in the legislative process. The course, direction, and magnitude of government research is one.

Disposition of lease revenues is another. Tax and depletion allowance questions are important in the matter of development, and measures to prevent or minimize pollution.

Canadian experience

A lot of consideration has been given to the Canadian model in the development of tar sands in Alberta, for guidance in phasing a new energy source into the existing energy mix. Perhaps this is the biggest of all the problems; it would tend to be if a truly dramatic technological or economic breakthrough should suddenly make shale oil sharply competitive with other energy sources.

If this does not happen, and I think it won't, then I believe that the Canadian model is not applicable to the pluralistic system already established in the United States. We don't have the mechanisms for that kind of control.
Summary

The oil shale problem is difficult to capsulize, and my own statement here is difficult to summarize. But I should at least make the attempt:

Oil shale is a vast energy reserve. Although much of it is in public ownership, a substantial fraction is private. Government faces many difficult decisions in determining a management and development course for the public reserves; it has little control over the development of private reserves. Decisions by private owners may make public objectives difficult of attainment, and the scope of this will depend, probably, on how the private claims are resolved.

There may or may not be urgency about the matter of oil shale development, but whether it is urgent in a national defense sense or not, good administration dictates that we get about resolving some of the issues.

The basic leasing statute has never been implemented; in view of the long delays, and the cleavage of opinion as to how development should take place, the Congress might well be asked to bring the statute up to date. The withdrawn status could be continued until Congress has had such opportunity.

Succinctly put, a major problem with which we are confronted is whether disposition of the oil shale resources will precede or will follow the development of a technology which will permit shale oil to compete in the marketplace with conventional petroleum.

If Congress does take up the matter, it might well fix guidelines for the conduct of research, particularly on the possibility of underground retorting. Such methods, if feasible, would have great advantage from the standpoint of good land management practices.