particularly felt in countries with weaker economic resources and administrative structures, and more sensitive, also psychologically, to inflationary impulses, due to a tradition of monetary upheavals — in other words, in countries where the operational difficulties and dangers of a system of floating rates are likely to be more serious.

Since recent days, the banking system and the credit policy have been developing in France through a series of particular experiences, and often with substantial innovations, to the study of which this Review is devoting a series of articles. In previous issues Prof. P. Cauvoux discussed the peculiarities of the organization of medium-term credit, involving among other things the adoption of unorthodox policies by the Central Bank and the ordinary banks (1953, page 53 et seq.), and Prof. J. S. G. Wilson considered the mode of operation of the deposit banks and the banques d'affaires in the light of current problems (1952, page 186 et seq.), and he outlined the evolution of credit control policy from 1945 to 1954 (1955, page 16 et seq.). In this issue Prof. Pierre Cauvoux discusses the « Compatibilité entre Banques en France et le Fixing de leurs Taux ».

The author does not reminisce the problems of bank competition in the abstract, but describes the developments and changing forms assumed by the competition among French banks during the last thirty years, from the first voluntary limitations of certain rates adopted in 1875 to the rigid and strict regulation of banking tariffs introduced by the legislation of 1941, to the « illegal » but tolerated regime of competitive freedom which prevailed in postwar years and which, contrary to what happened in Italy, has not yet been made subject to new regulations.

According to Prof. Cauvoux, the French banks have again been led to extend competition from the field of quality of services to the traditional and long-term cartelized field of prices, and hence to engage in a struggle as credit rates beyond the old technical limits, in order to force the flow of funds and escape the rigours of the French rediscount policy. The author’s judgement on the results achieved is however reserved; in any event, he feels that the competition on deposit rates has assumed such dangerous forms that in France also the speedily adoption of new regulations has become a matter for serious discussion.

In September 1951 — in connection with the Parliamentary Enquiry into Unemployment (see this Review, 1951, page 55 et seq.) — the Central Statistical Institute of Rome conducted a survey of labour forces in Italy, based on a sample of 65,052 families throughout the country. In May 1954 a second survey was conducted, followed by a third one in May 1955. Sampling surveys of labour forces have thus become a part of periodical statistical surveys in Italy.

The final results of the 1954 survey, which have recently been published, are condensed by Dr. Giorgio Ruffolo in the article « The Second Enquiry into the Labour Force in Italy ».

Quoted from: The Italian version of this study will be published in the September 1955 issue of the « Rivista Trimestrale di Statistica e Procedura G.U. », to which we are indebted for permission to publish the original text in this Review.

(1) The Italian version of this study will be published in the September 1955 issue of the « Rivista Trimestrale di Statistica e Procedura G.U. », to which we are indebted for permission to publish the original text in this Review.

(2) Oklahoma initiated the pioneering production control law in 1954, but effective general regulation, with its continuous modification of the law of capture and recognition of property rights, did not come until around 1955, after stringent efforts from 1933 on. See Mmonauss and Mertens, Legal Structure of Petroleum Production, (1) Yale Law J. 33 (1954) and Weiner, Oil: Production or Conservation? (1957) issues.

The United States, the landowner possesses whatever lies below the land surface as well, and except where there are specific legal limitations, may exploit it as he chooses. Petroleum and natural gas raise unusual problems in applying this common law real property right. They occur naturally in underground pools, whose outlines bear no necessary relationship to the ownership of the land surface above. And they are fugacious: whoever drills a well on land over a pool may draw oil or gas from under his neighbor's land as well. Landowners who found themselves despoiled in this manner by more aggressive neighbors, after the discovery of oil in Pennsylvania in 1859, brought suits in the courts to assert their « correlative rights » to the underground reservoir — a property right in the subsurface in some way proportionate to the superior land surface they owned. The state courts, faced with such conflicts and lacking any guidance from state legislatures, formulated the common law « rule of capture ». The oil, they decided, belonged to whoever took it out, regardless of where it originally came from. This remained the virtually universal rule of law in the United States until after 1929, when state legislatures finally intervened to place limits upon the unrestricted private right to drill and capture (1).

Because of the law of capture, the vast American petroleum resources were exploited under a regime of virtually uncontrolled pri-

Free enterprise. An enormous and highly developed industry emerged before serious controls were imposed (2). When finally regulation became inevitable, its task was therefore not to encourage and promote a new industry, but to curtail an excessive rate of private production, in the interest of conservation, economic stabilization, and the protection of correlative property rights. Thus the American regulatory experience in this industry has been unique among all the major producing countries of the world, with the partial exception of Canada.

There are areas in the United States in which the State and Federal governments, by virtue of their ownership of the land surface, are in a position more nearly comparable to that of the governments of most other oil producing countries, which control subsurface rights. The Federal Government, whose holdings are most extensive, owns 255,000,000 acres, or 24% of the country's total land area (3). In these regions, exploration and production are possible only upon receipt of government permission.

But it is instructive that there is no significant American literature analyzing the experience in public ownership and regulation.

Except for the dispute over state vs. federal ownership of the so-called tidelands (4), the
issues in this industry that have claimed almost the entire public attention have centered about the law of capture, the consequences of unregulated private exploitation on privately owned lands, and the regulatory legislation imposed since 1929. Production of crude oil on the Federal lands amounts to only about 7% of the national total (8). In some states the relative importance of production on state-owned lands may be somewhat higher; and production from offshore, underwater reserves, though at present a very small proportion of the national totals, will probably eventually make a major contribution to total American output (9).

But the most important problem has been the regulation of private production on private lands.

Conservation and Market Stabilization.

The primary consequences of the rule of capture were an extraordinarily rapid growth of the American petroleum industry — vast riches lay under the soil to be tapped by whoever could find them first and draw them out most rapidly — and a frightful waste. A concomitant result was extreme market instability.

The Need for Production Control.

An underground oil pool is like a great natural engine, an equilibrium of the pressures of encircling rock, dissolved or overlying gas, and underlying water. A well opening releases these underground forces, which propel oil, gas and water upward to the surface. Properly exploited, these pressures can be harnessed to deliver oil to the consumer at prices believed to be of competitive importance. (Communication of April 9, 1925 from H. D. Loomis, for the Glendale, Glendale Survey, U.S. Dep. of Interior, Washington, D.C.) Oil and gas leases were in effect on 740,000 acres of Federally owned land at the end of 1925. (Table 1, U.S. Geological Survey, Conservation Division, U.S. Dep. of Interior.)

Thus a technique which accounted for less than 35% of total U.S. crude oil production in 1923 (A.P.I., pp. 36, 159, ed. 3, p. 155) credited the major portion of its revenue from leases of state-owned lands to special funds for the public schools and university.

Total accumulation in these funds (whose principal came from oil severance payments) was almost $400 million. (Communication from J. Bostie, Baton Rouge, supra note (4).) These sums, accumulated over many years, are probably not more than a small portion of the oil royalties paid by all lands owned in Texas in 1925 alone. Still they indicate a total production on state-owned lands comparable to the production on Federal public lands, which have brought in about $2,000,000 in rents and royalties since 1924. (Figueroa, Loomis, Thornhill, Oil and Gas Leasing on the Public Domain, H. T. Gregg, The National Bank Building, Denver, Colo., 1925, supra note (4).)

Extremely rough estimates place potential crude oil reserves in all oilfield areas of the United States at fully 75% of erect proved national reserves. This consensus is that the entire reserves are on the conservative side. Letter of May 29, 1925, from Fred L. Hefley, Bureau of Land and Irrigation Survey, Department of Interior, to the Secretary of the Interior, Washington, D.C.

The effectiveness of the rule of capture is thus evident from both the oil production discussed above and in past years, and from all the larger picture that makes up the American crude oil story.

Regulation of Crude Oil Production in the United States and Lessons for Italy.

The history of the American oil industry under the rule of capture was marked by cycles of shortages and gluts. The resultant extreme fluctuations in crude oil and products markets were economically wasteful. Oil that would have been worth $2 a barrel, to both producers and consumers, if taken out more gradually (the basic field price today is $2.25 a barrel) reached a low as $0.10 a barrel in East Texas in the 1930's. And, as we have seen, most of it was either poured out to the ground, evaporated in inadequate storage facilities, or skimmed and sold for virtually nothing for inferior uses.

The market instability was also obviously contrary to the interest of established companies in the industry. So powerful public and private interests alike -- in conservation and market stabilization — dictated the introduction of some form of production control. The distaste with which Americans generally regarded government regulation of business, and the independence of the oil industry which had successfully resisted these pressures. But a series of dramatic discoveries between 1926 and 1931, culminating in the East Texas strike, combined with the depression after 1929, finally brought remedial action.

The body of regulation which has emerged is formidable complex, largely because the primary burden of control is assumed by each of the producing states, under its police power, with the result that the laws differ substantially from one another. The role of the Federal Government is an important one, but it is essentially one of coordination and support of the respective state programs (10).

Also much of the real corpus of the laws in an area as technical as this must be sought in the orders of the state administrative agencies.

(10) Effective regulation of production for a national market clearly involves interaregional cooperation, and hence at least the burden of recognition and acceptance by the government in the states which have jurisdiction on interstate commerce. In fact, with the Consent Decree of 1921 (51, 52), the California Oil Industry, an Association of the California Oil Industry, and Hunt and Kibbey, Petroleum Reforms, December 1921, the Supreme Court of California, Kreindler v. Hunt (A.R.C., Reappraisal in the Social Control of Industry, 318, 321-372 [1924].)

(11) Most of the foregoing account is based on Neumark, Reg., The Conservation of Oil, 1, 51 [1926], 51; Your Eveready, 1927; Your Extension, 1927, Your Economy, 2; and your own percentages of their total production in 1927. A.P.I., p. 36, pp. 117, 120.
for the latter regulation (14). As a result, proper well-siting has often not been achieved: before World War II, more wells were drilled under exceptions and exemptions to well-siting orders than under such rules, because small pieces of land have successfully insisted on the right to drill on their own properties (15). Probably only compulsory unit operations can ever fully meet the requirements of conservation; yet state commissions have typically been unwilling to force resistant producing interests to cooperate in this fashion. Nevertheless, very substantial progress has been made along both these lines (16), and few critics deny that these regulations have been socially desirable.

Proportioning to market demand.

Every month the Bureau of Mines, of the U.S. Department of Interior, makes detailed estimates of the prospective market demand for petroleum products. Translated into anticipated requirements for crude oil, these statistics are monitored by the Interstate Oil Compact — an agency for the cooperation of oil producing states — into estimates for the individual states. The latter in turn break down their totals into daily production quotas ("allowables") for each field and well under their jurisdiction (17). Under this system national production has typically been held below the M.E.R. since 1935, except during World War II. In 1954, for example, while national production ran at about 6½ million barrels a day (b/d), estimated shut-in capacity (the difference between actual output and M.E.R.) averaged over 1½ million b/d; and the ratio of shut-in capacity was even greater in the late 1930’s (18).

Historically proportioning to market demand has (or would have) contributed in some ways to conservation of oil, by any reasonable test. Between 1926 and 1931, 14 billion barrels of oil were discovered, increasing estimated national reserves from approximately ten to over twenty billion barrels. The East Texas field alone was capable of producing well over 1,000,000 b/d, when total national production was less than 3,000,000 b/d (19). It would obviously have been desirable to restrict production of these fields to M.E.R. But this would still have resulted in an output far above what the market could absorb. Actual physical waste of oil above ground would still have ensued. It would have been difficult to enforce ratcheting taking (controlled production from all wells in a given field) if production exceeded what purchasers were willing to take. Thus not only would correlative rights of surface owners still not have been preserved (20); disproportionate withdrawals would also have resulted in irregular encroachment of water and gas and hence incomplete recovery of the oil underground. Also the low levels to which oil prices would still have been driven would have forced the closing down of stripper wells, with resultant permanent loss of their production, even though in the longer run the market would have been fully prepared to pay the higher price. The law of capture would still have been an economically inefficient influence, forcing each well owner to produce all the government permitted, even though the inter-

(18) See for example, Brown V. Broder, A National Policy for the Oil Industry (1938), and Waterman, op. cit., supra note 21.
(19) In first proportioning actually increased the amount of unnecessary drilling on some fields, since each well must by law be allowed a maximum production quota, and no land owners sought, by drilling extra wells, to increase their total allowable.
(20) See addresses by Hines H. Baker, President, Humble Oil and Refining Co., A Achievements and Unsolved Problems in Oil Field Conservation, copies obtained from the Humble Co., also reproduced in U.S. House of Representa-
tives, Hearing on S. 396, Provisions in Recent Price Increase of Gasoline and Oil, 1955, pp. 395-416 see also Reich Zimmerman, Both on production and conservation of oil, to be published by Yale University Press, late 1955 or 1956.
(21) This account is necessarily oversimplified. Not all producing states belong to the Interstate Oil Company, not all of them generate production to market demand. In California, proportioning is accomplished in effect by cooperation among the various producing and refining companies, a practice at present under attack by the Federal Government under the antitrust laws.
(23) Bunker C blends certain proportions of crude oil from various sources, so that by adding different proportions of crude oil from different sources, a blend with the desired properties can be produced. These proportions are not necessarily fixed, and can be changed from time to time, depending upon the availability of different crude oils, and the requirements of the market.
The competitive opportunities of independent refiners and marketers are seriously constricted and their fortunes rendered more hazardous by these same factors: for example, they are periodically subjected to sharp "squeeze" in their margins, which they must pay for their raw material (24). And the world price of crude oil remains closely articulated with the U.S. Gulf Coast price, artificially maintained in this manner, even though actual production costs in other areas are evidently only a fraction of the costs in the United States (25).

For these reasons many observers have proposed the abolution of prorotention to market demand. Most of them would substitute controls or both of the following systems: (1) Prorotation only to M.R.R. It is possible that the increase of waste that might follow excesses of production over market demand at current prices would be more than compensated for by lower prices, enhanced utilization, and greater competition in oil markets of the world. (2) Compulsory unification of all oil fields, or at least of all flsh fields. In this case, no production control at all might be required. Pool owners, freed at last from the tyranny of the rule of capture, would have every incentive to adopt the most efficient recovery methods, and to draw oil out of the ground only as rapidly as seemed to them economically desirable. In this manner the community as a whole would derive the maximum net economic value over time from its underground oil resources (26) provided there

by the present writers and M. G. De Chateau, Inteintegration and Prorotation in the Oil Industry, to be published by Yale University Press, 1956.

(24) See Ind., and Bonner and Bates, Energy into the Oil Refining Industry: Vertical Integration Re-Examined, 61 Yale Law J. 846 (1954). It should be added however that the number of independents in the number of independent refiners in the U.S. since 1935 has also been attributable to technological developments in the art of drilling and the oil market is reasonably sure that the limitation of the basic crude oil production, driving many "independents" out of business, undoubtedly associated with the present situation in conservation.


Both sides in the argument of compulsory utilization as an alternative to prorationism, see Browse, op. cit., supra note 14.

In 1934 there were operating in the United States 77 oil fields which had estimated ultimate recoverable reserves of 100 million barrels or more, allocated for only 40.5% of total output in that year and had 95.67% of total estimated U.S. reserves as of January 1, 1935. In view of the excellent facilities for low-cost transportation of crude oil and associated products, the present situation is the logical outcome of the natural forces that are in play.
the search for oil is expensive and risky. The great majority of wells drilled prove to be dry holes. So, it is maintained, the prospect of high rewards — and the actual receipt of very high returns by the fortunate few — is necessary to induce capital to enter the field.

But it must be remembered that the free market will ordinarily offer higher profits to the successful venture the more risky the field in which it operates. Even without favorable tax treatment, the oil industry offers huge prospective returns to the wildcarder. It is not clear why the tax laws should cumulative these rewards for risk-taking in this industry, and not in others.

Moreover, in the absolute volume of tax savings, the major beneficiaries of the depletion allowance are of course the larger producing companies. It may well be argued that for these companies, although each individual exploratory venture is undoubtedly very risky, their exploratory programs considered as a whole bring in returns with a reliability and regularity not appreciably different from investments in other industries. Even without tax preference, thus, these companies need have no difficulty writing the costs of unsuccessful ventures off against the successful ones, if not in each year, then over a period of years. The American Mid-Continental Oil and Gas Association has estimated that over the period 1928-48 the oil industry’s expenditure for finding oil were approximately the same as the depletion allowed by the tax laws. A defender of these laws cites this fact to support his conclusion that the amount (of depletion allowed) is not excessive in relation to the capital risked in the search for oil (33). But in this same period the country’s ultimately recoverable reserves increased from ten to almost thirty billion barrels, and their money value twice as much again (34). What these facts mean is that the oil industry has been able thus to increase the value of its capital assets almost six-fold, by exploration, with funds obtained from the consumer and spared by the tax collector.

III. - Publicly-owned lands.

Federal.

Under the law, exploration and production of oil and gas on the "public domain" may be conducted only under leases granted by the Bureau of Land Management of the U.S. Department of the Interior (34). Leases may be granted only to U.S. citizens or corporations of which the majority interest in the latter however without limit, so long as their own governments do not deny similar privileges to Americans.

No less must before 1954 hold such rights (35) for more than 15,960 acres in any single state; the act of Aug. 2, 1954, (36) increased these limits to 45,680 acres for the United States and 100,000 acres for Alaska. However, producing companies customarily conduct much of their exploration not as lessees, but under options obtained from land owners and lessees. Option agreements give them permission to explore, sink test wells, and the privilege of either taking over the lease at a fixed price or merely operating the well, if they succeed in finding oil. In this way the prospectors may be able to afford extensive exploratory operations, and have a more extensive territory to explore, without becoming a lessee himself. The law governing the public domain permits a company to hold such options, of no more than three years duration, covering no more than 200,000 acres in each state (before the 1954 amendment the limits were two years and 100,000 acres). It is only a company’s actual leases that may not exceed

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<th>Unit</th>
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<tr>
<td>Acres</td>
<td>45,680</td>
<td>Formerly 15,960 acres in each state.</td>
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<tr>
<td>Acres</td>
<td>100,000</td>
<td>For the United States and 100,000 acres for Alaska.</td>
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(34) The following summary of the law is based on Havens, op. cit., supra note (5), and Code of Federal Regulations, Title 30, Ch. 1, Pt. 250. The basic statutes are 43 Stat. 377 (1925), 43 Stat. 723 (1925), and 66 Stat. 971 (1950). On the 1954 amendments, see below. There are other lands owned by the Federal government (not the so-called public domain, but the latter is for the most important). In addition, there is the Outer Continental Shelf Act of 1947, regulating the procedures in the underwater areas beyond the "eighteen miles", entitled to the coastal states, see p. 75, below.

(35) The reason should be remembered that the rights in question are leases on the public domain. Companies may acquire rights up to the state line, but also on the Federal government’s much less extensive "acquired lands", 43 Code of Federal Regulations, Pt. 250.106 (43 Stat. 66, Chap. 499, Public Law 951, 85 Cong. 1st Sess., S. 318).

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(35) As in the case of other provisions, the law is more generous to companies in Alaska: there the royalty for the first discovery of a new pool is only 5%, for the first ten years.

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(37) As in the case of other provisions, the law is more generous to companies in Alaska: there the royalty for the first discovery of a new pool is only 5%, for the first ten years.
tion or production of crude oil and natural gas (43). Bidding is usually in the offer of cash bonuses, in which case the typical royalty is 12.5% of the value of crude oil produced. Sometimes, instead, bonuses and rents are predetermined, and bidding is on the royalties.

The following table, covering three years in inland Louisiana, five years in the Louisiana submerged lands, five years in Texas, twenty years in California — with varying possibilities of extension if exploratory drilling continues in good faith. In all cases, as on Federal lands, the leases continue as long as oil or gas are produced in paying quantities. The States did not inform the writer of any limitations on the total acreage in the State any one person or company might lease.

Most states require diligent prosecution of exploration or production on leased lands — in Texas the drilling of as many wells as the facts justify; California leases may carry specific requirements about the maximum time that may elapse between the execution of one well and the commencement of another, and the depth to which wells shall be drilled. In contrast with conservation legislation, the stipulations here seek to assure sufficient exploration to the public benefit; California leases prescribe minimum numbers of wells to be drilled, and require production continuously at M.R. At the same time, the States generally impose the same sort of conservation controls on public as they do on private land (43).

Unfortunately there is no literature analyzing and evaluating the application of the above-described statutes, and the writer lacks sufficient first-hand experience to do so. In any event, we find ourselves perhaps in an area in which economic logic cannot supply decisive guidance for public policy. The problem clearly posed on state-owned land — though it exists also on privately-owned land, and in formulating tax legislation governing depletion and depletion as well — is one of providing adequate incentives to produce a desired rate of development of a natural resource, on the one hand, while preventing spoliation of the social patrimony for the exclusive benefit of the few. It is clear that the regulations just outlined attempt to strike some sort of balance between these conflicting considerations, with their opening of public lands to private production, yet adding acreage limitations, and requirements of competitive drilling practices, and diligent working. Economics alone cannot determine the amount and kind of incentives required, on the one hand, or the desired rate of uncovering and using up natural resources, on the other; and hence is of limited usefulness in determining the appropriate terms and conditions of regulation.

The 1954 amendment to the Federal law, relaxing some of the restrictions on private enterprise, illustrates the kind of problem involved. The bill's supporters argued that the increasing costs of exploration in the United States, with the average depth of wells increasing yearly, required such a liberalization: private capital could not be expected to take yearly larger risks without the possibility of exploiting more than the 15,350 acres of public domain theretofore permissible in each state (43). No voice was raised in Congress in opposition either to this contention or to the bill itself. The even greater relaxation in the case of Alaska undoubtedly reflected the feeling that both the risks in that far more distant and less well prospected region, and perhaps the desirability of attracting private capital to its economic development were proportionately greater. Yet at the time the bill was passed, to offer greater incentives for exploration on the public lands, some 1,500,000 b/d, or over 20 percent of the nation's total M.R. capacity was already shut in to keep production from exceeding a reasonable market demand, and oil producers were putting heavy pressure on Congress (and, perhaps more effectively, on the importing companies themselves) to curtail imports. On the other hand, it must be remembered that natural resources are not really economic resources until they are found. It may be entirely consistent with the national interest to pay a high price to elicit exploration today while yet holding some of the productive capacity thus discovered in reserve for tomorrow.

IV. Lessons of the American Experience

The years since World War II have witnessed an ever-increasing interest in the possibilities of finding crude oil in Italy. Several successful wells have already been drilled, and numerous companies have made application for permission to join the search. Can the Italian government draw any lessons from the American regenerative experience?

The basic difference between the controlling legal institutions in the two countries clearly renders any attempt to do so highly precarious. Italy is faced with the question of granting exploratory and production concessions to its subsoil, subject to limitations designed to protect the public interest therein, while assuming capital, efficient development. The major question facing it is how severe these limitations may safely be — stated alternatively, how limited concessions it can offer private enterprise — and still get its oil found and produced at an acceptable rate. In the United States, instead, maximum incentives were offered by the rule of capture, and for 25 years minimum safeguards imposed. The result was an extraordinarily rapid industrial growth, but the wastes were stupendous.

Even if we confine our attention to that portion of the American industry in which the legal situation is basically similar — the government lands — comparisons are dangerous. For there was already in existence in the United States a thriving industry before the basic code of 1920 was written. The pre-existence on private lands of a going industry — with all this implies in the way of skilled labor, availability of venture capital, a huge market, an accumulation of geophysical information built up over 50 years of wildcating, a pool of administrative-technical talent on which to draw for staffing regulatory government agencies — would have justified statutory provisions that would be entirely inappropriate in a different economic environment. We have already noted, for example, that the different situations of Alaska and continental United States, by, or to explain the variations in the law applied to each.

In terms of geographic proinquity of potential supplies to sources of capital and markets, Italy is apparently not so poorly situated as Alaska. But in terms of the preconditions listed above, neither is it so well endowed as the continental United States. On the other hand, Italy has the probable advantage over the United States that its surface has, so to speak, hardly been scratched. It probably need not anticipate the need in the immediate future for 15,000 to 20,000 foot wells, costing hundreds of millions of lire each, as are being drilled in the United States.

Because of these important differences between the two countries, it would probably be most useful to confine ourselves to certain general observations and suggestions based on American experience, leaving it to the reader to decide to what extent the conclusions are applicable to the Italian situation.

(1) American oil history teaches us to demonstrate the effectiveness of the lure of immense riches in getting oil discovered. With all its insufferable waste, the anarcho system of capture, in the American environment, developed the world's greatest oil industry. Continuous new discoveries have kept the ratio of reserves to an ever-increasing annual consumption extremely steady, thirty years after imitation exhaustion of the nation's oil reserves was widely predicted. A country would be well advised, it would appear, to offer adequate incentives to the private wild-catter.

(2) Competitive withdrawals from individual pools makes for intolerable waste, and must not be permitted. But the spur of competitive exploration, with substantial rewards going to the successful, appears to have been an excellent way of getting oil found.

(3) One possible way of determining in an objective fashion what price society has to pay for assiduous private exploration — or, conversely, much of what they find wild-catters may be willing to return to society
while still being willing to search — would be to issue exploration and production leases by competitive bidding. It will be noted that this is the frequent procedure on publicly-owned lands in the United States. Such a system presupposes the existence of a sufficient number of bidders to make the competition effective.

(a) At the same time, competitive bidding may result in too much of a small country's oil resources falling into the hands of a few powerful international oil companies, who can offer the highest bonuses and have the greatest incentive to retain control in their own hands. Thus the attempt to secure the highest possible money return from leases may defeat the public interest in competitive development of its oil. This danger suggests the desirability of limiting the acreage any one company may control — with a higher limit for exploration than for production of known fields — and arduous efforts to prevent evasion of these limitations by the proliferation of de jure independent but de facto subsidiary lease-holding companies. It suggests also that permits for exploration should be made available on relatively easy terms, so as to attract numerous, independent wild-catters.

(g) When the government owns the sub-soil rights, it is in an ideal position to insist on intelligent well-spacing and unit operation. There then emerges the opposite threat: that concessionaires may not develop and produce from known reserves with sufficient rapidity, for monopolistic reasons. How can this danger be minimized?

(a) The maximum efficient recovery rate might be designated the minimum rate of withdrawal instead; California leases, it will be recalled, require production up to M.E.R. on state-owned lands. This provision might not assure sufficient development, however. It is doubtful, for example, that the rate of production in Middle Eastern oil fields is below the M.E.R. Supply is held down to what the major integrated companies believe markets will absorb without price weakness by controlling the drilling programs in areas where oil is known to exist, in accordance with the estimates of requirements provided by the owners of the cooperative concessionaire companies.

(b) It might be possible to prescribe minimum programs of development, such as various American state laws do, to assure assiduous prosecution of leases. Enforcement of such rules might require the exercise of substantial administrative discretion, which presupposes the presence of an efficient bureaucracy.

(c) Another spur to development would be a rule limiting the duration of exploratory permits where no production is forthcoming, as is done in U.S. federal government leases. Thus the prospector would have an incentive to search diligently. Once oil was found and produced, he would be required to produce up to M.E.R.

(d) Competition would be the most effective spur to economically optimum development — not competition in withdrawal from each pool, which would be the intolerable rule of capture, but competition between unitized fields for the maximum share of the Italian market. The refiners in Italy could easily be required to give preference to Italian-produced crude oil, where practical, thus assuring an adequate market to the most aggressive producers. Here again we return to the efficacy of offering maximum opportunities to the independent wild-catter-producer.

(e) It is in this connection — providing competition with private enterprise — that a public corporation like E.N.I. might make its most positive contribution. By the same token, it would seem safest to have such a corporation itself subject to the spur of rivalry: it too might be reluctant to take unusual risks with taxpayers' money in seeking for oil, or to spoil the market.

(f) The foregoing emphasis on the desirability of offering adequate incentives to independent exploration, and competitive pressure to assure maximum efficient production may seem to run counter to the public interest in conservation and in avoiding the earning of high profits, especially by foreign companies, from exploitation of the public's resources. To these considerations there are two answers. First, competitive bidding and development would help hold profits in check. Second, neither conservation nor the public interest (so far, at least, as the economist can define them) consist in simple failure to discover and use natural resources. Waiting involves a real economic cost, and therefore risk capital is worth paying for, because $1,000 prudently invested today is worth more than $1,000 hidden somewhere underground and discovered a year from today. Conversely, a barrel of oil discovered and produced tomorrow is worth less to the Italian economy than a barrel extracted today, and the difference is worth paying for — to Italian capitalists, if they are available, to foreign capitalists, to the extent they can speed the process — provided, of course, the price paid is not excessive.

Ultimately of course the basis for these decisions of economic policy must be political rather than purely economic. The value which a country places on a given rate of economic development, the price it is willing to pay therefore by permitting small groups to profit by contributing to it, are not economic but political data. An economist can not as such appraise the possibilities of loss of political independence, or menace to democratic institutions posed by the creation of fortunes from oil exploration; nor can he appraise the danger that a governmental bureaucracy may be incapable of regulating the granting of concessions in the public interest. Here again he may only point out that delay, too, is economically costly, and probably politically costly as well; and that a competitive, decentralized economy is probably best adapted to minimize the political as well as the economic dangers.