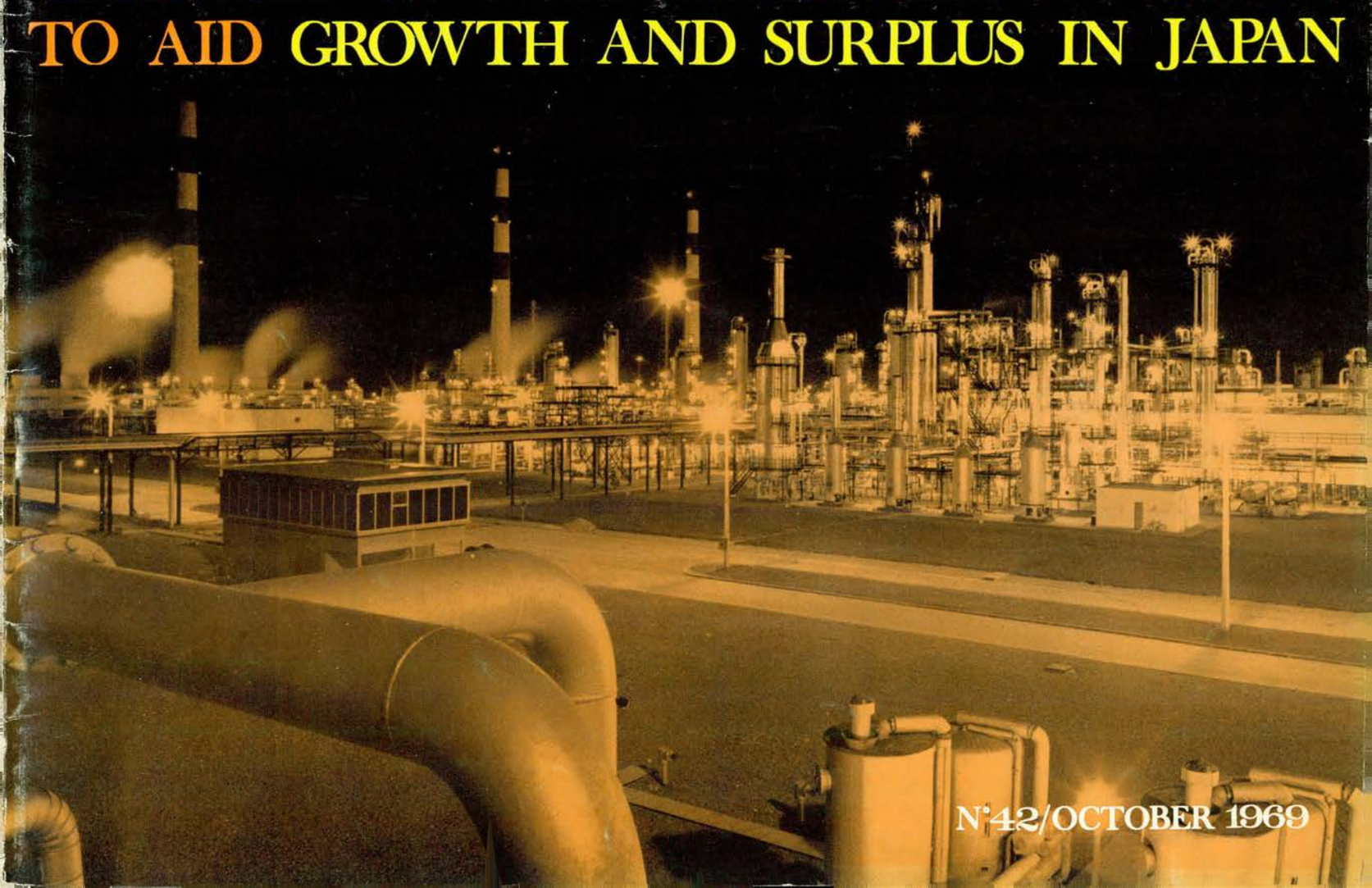
the OECD OBSERVER

IMPROVED TRADE FORECASTING THROUGH ECONOMETRIC STUDIES

EXAMINATION OF THE GERMAN CAPITAL MARKET

IMPACT OF NATURAL GAS ON ENERGY POLICIES

EXAMPLE OF A COORDINATED APPROACH TO AID GROWTH AND SURPLUS IN JAPAN



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THE NEW SECRETARY GENERAL OF OECD

On 6th October Emile van Lennep officially took up his post as Secretary-General of OECD to which he was elected by the Organisation's Council in February of this year. He succeeds Thorkil Kristensen, of Denmark, who has headed the International Secretariat of OECD since its inception in 1961.

Jonkheer van Lennep comes of a family long well-known in the Netherlands in banking and shipping circles; in contrast, one of his forebears was the nineteenth-century Dutch writer, Jacob van Lennep. He himself has a wide reputation as an economist and financial expert in both national and international circles.

He has held a succession of important posts in connection with OECD and its predecessor, the Organisation for European Economic Co-operation (OEEC). Until elected as Secretary-General designate, he was Chairman of Working Party No. 3 of the OECD Economic Policy Committee, a high-level body of government economic advisors and central bankers which deals with policies for the promotion of better international payments equilibrium; and Vice-Chairman of the Plenary Economic Policy Committee. He was the Netherlands Delegate to the Development Assistance Group, now known as the OECD Development Assistance Committee.

Among his other international functions has been the chairmanship of the Monetary Committee of the European Economic Community, and Netherlands Delegate in the Meetings of the Deputies of the Group of Ten; as such Emile van Lennep has played a leading role in the recent negotiations for the reform of the international monetary system.

After leaving Amsterdam University with a Master's degree in law in 1937, Emile van Lennep's career advanced rapidly. From 1940-1945 he served in the Foreign Exchange Institute at the Hague, and then transferred to the Netherlands Bank, Amsterdam. In 1948 he was appointed Financial Counsellor of the High Representative of the Crown in Indonesia, a post he held for two years.

In 1951, at the early age of 36, he became Treasurer-General of the Netherlands Ministry of Finance. As such, he was responsible for the formation of economic policy — in particular of financial, budgetary and monetary policy. Also in this capacity he took part in the annual meetings of the International Monetary Fund, the World Bank and the International Development Association. He resigned his functions as Treasurer-General on assuming those of Secretary-General of OECD.

THE GERMAN CAPITAL MARKET

In view of the importance of adequately developed and efficiently functioning financial markets and of their role in international capital movements, OECD's Invisible Transactions Committee has undertaken an examination of these matters on a country-by-country basis. The first study to be published deals with the situation in Germany (1).
The Invisible Transactions Committee is a group of independent experts and the views they express, which are summarised here, are not necessarily those of OECD Member Governments.

(1) Capital Markets in Germany

There have been important changes in the German financial system in the last three years. Many problems that existed before are in the process of being solved. A recession which began in 1966 has been weathered; the Government's attitude to fiscal and monetary policies has become more flexible; and Germany has become a very important exporter of long-term capital (see inset). It is, in fact, the only country where foreign security issues are practically treated like domestic issues.

The institutional framework has shown great adaptability : passage in 1967 of the Stabilisation and Growth Law gives the authorities greater flexibility in the use of fiscal policy and provides for a " Conjuncture Council " one function of which is better control of public debt operations in line with the general aims of economic and monetary policy. The main issues now are not institutional, OECD's Invisible Transactions Committee concludes, but policy matters, and much will depend on how the new institutional framework is applied.

An important question is to what extent the extraordinarily high capital outflows from Germany in 1967, 1968 and 1969 were due to factors which may be expected to affect capital movements in the years to come. In 1968, roughly half of the net outflow of private long-term capital consisted of banking funds. This element will certainly be reduced with increasing domestic demand for funds and tighter bank liquidity. Whether German purchases of foreign fixed-interest securities will continue at a substantial rate depends mainly on future interest rate relationships, basically between Germany and the United States. As long as long-term interest rates in the United States remain at about the same level as those in Germany or even higher, it seems likely that, as past experience shows, rates in the Euro-bond market will exceed German rates so that outflows of portfolio capital from Germany may be expected to continue.

Another more permanent feature of the German capital balance may be the recent change in the position of the direct investment capital account from previously high net inflows to equilibrium or even net outflows; foreign direct investment in Germany, which had gradually increased during the period 1958-1964 and jumped to record levels in both 1965 and 1966 fell back sharply in the following two years. This development mainly reflected US direct investment activities. As a result of the US balance of payments programme — initially voluntary but mandatory since January 1968 — US foreign subsidiaries operating in Continental Europe reduced their recourse to US sources and financed a much higher proportion of their plant and equipment expenditure from local sources.

During the same period German direct investment abroad showed a steady tendency to increase and in 1968 exceeded foreign direct investment in Germany, so that the net balance on direct investment showed an outflow for the first time.

If the propensity of foreign, notably US, companies to make direct investment in Germany does not increase again (assuming abolition of the US restriction programme) and if it remains cheaper and more convenient for foreign subsidiaries in Germany to finance their operations from local sources, the change in Germany's direct investment position might remain a more permanent feature. This may be reinforced by increasing German direct investment abroad, since many German industrialists and bankers feel that the maintenance of a strong export position in the long run would require higher direct investment abroad.

If, in the future, more of the emphasis of any restrictive policy measures could be shifted to fiscal policy (with the aid of the new Law on Stabilisation and Growth) so that undue monetary pressure could be avoided, it would seem possible for capital outflows to remain at a fairly high level, enough to match a large portion of any current account surplus. The German authorities feel that, taking a longer view,

Germany should be an exporter of real resources, given their high rate of income and domestic savings, and that a considerable proportion of exports of real resources should be matched by exports of long-term financial capital. In this context it is recalled that recent official five-year projections of GNP and its major components foresee for 1973 a surplus on goods and services (measured in GNP terms) of DM 10.6 billion or 1.5 per cent of GNP (at current prices). The corresponding — exceptionally high — figures for 1968 were DM 18 billion and 3.4 per cent of GNP respectively and for the first six months of 1969 were at an annual rate of some DM 14 billion.

Four other main policy issues are discussed in the report on German capital markets.

Future Level of Savings and Investment

In 1968, the German authorities set up five-year target projections of gross national product and national income and their major components. According to these, the investment ratio and the savings ratio, both of which are high by international comparison, are expected to remain so and to leave a margin of savings over investment which would permit a current surplus in the balance of payments — though a smaller one than that of 1968 — to be financed, it is hoped, by capital exports.

Imbalance between Long-term and Short-term Markets

The main defect of the German financial system, it has long been thought, is a disequilibrium between the short-term and the long-term market for funds : in the past a large share of the Government's demand for funds was covered by long-term finance, whereas on the supply side there was a preference on the part of savers for liquid assets. Liquidity preference declined prior to 1965 but was reactivated by the slump in bond prices in 1965-1966 and the recession of 1966-1967; this recent increase in liquidity preference has been a matter of concern for the German authorities. This problem is less serious today than it was as recently as two to three years ago because its solution is being approached from several angles-:

• Better control of the public sector's long-term borrowing.

Control of the overall level of borrowing has been enhanced by the Stabilisation Law of 1967 and the type of borrowing (long- or short-term, securities, direct loans, etc.) is regulated by the Conjuncture Council with a view to the capacity of the market.

• Promoting investors' demand for longer-term assets.

The Government has been encouraging the purchase of securities by the public though the results so far have not been promising. Savings invested in savings deposits and similar instruments have been growing faster than in securities. Under the savings promotion scheme, deposit savings are ten times as large as security investments, though the requirements with regard to immobilisation of funds invested are the same. This may be due in part to the fact that the " instalment savings contracts " apply only to deposit savings, a limitation which does not seem consistent with the general policy. In a recent law, securities have been included under " instalment savings contracts ".

The German authorities welcome the recent expansion of domestic and foreign investment trust activities as a means of attracting more private savers to the security markets.

• Issue of medium-term securities.

The gap which existed in the medium-term range of securities is being filled. In 1967 the savings banks started to issue saving certificates *(Sparbriefe)* of 5 to 8 years maturity, yielding about 6 per cent. In January 1969 the Federal Government launched a treasury certificate *(Bundesschatzbrief)* with a six-year maturity, with progressive interest, yielding 5.9 per cent at maturity. This instrument may be cashed quarterly after a year.

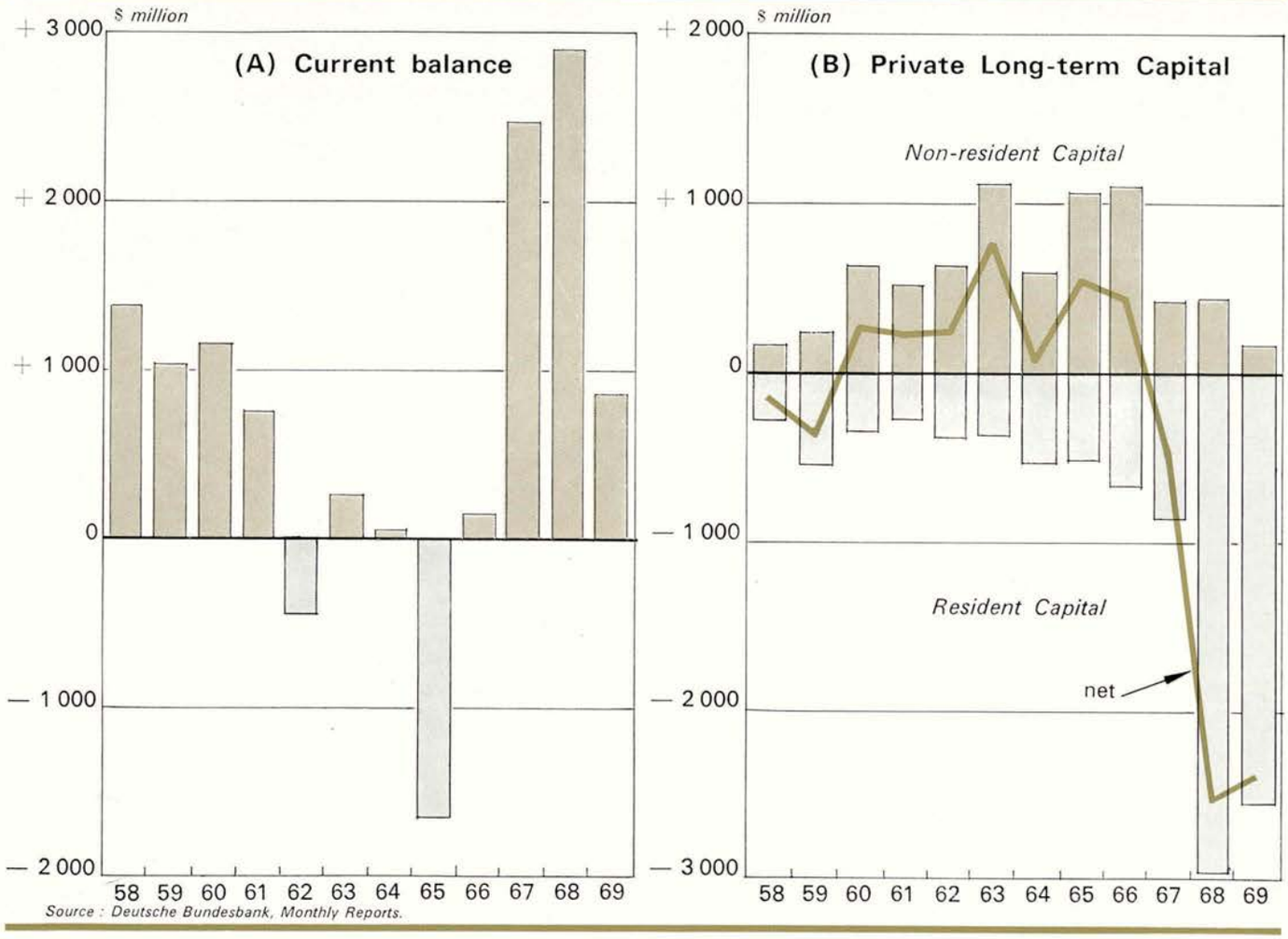
Cyclical Instability of the Bond Market

It is generally said that the bond market overreacts to changes in monetary policy, and that this is largely due to the important role of commercial banks as ultimate buyers of bonds. These statements need qualification.

In the past ten years, there have been two phases of tight credit policy : 1959-60, and 1965-66, both induced by the desire to control a boom. In the first phase, the discount rate was raised by two full percentage points, and most short lending rates followed, but the bond yield rose by only one point. In the second phase, short-term rates also rose by two points over about 20 months, yet this time, bond yields rose by the same amount, with bond quotations declining by about 15 per cent. This movement was clearly excessive and demoralised private bond buyers who reduced their purchases from DM 4.5 billion in 1965 to 2.6 billion in 1967. The recovery of the bond market during 1967 and 1968 was remarkable. Average yields on new issues went back from a peak of 8.6 per cent in August 1966 to 6.3 per cent at the end of 1968, and the volume of net bond issues (including foreign DM-bonds) recovered from 6.8 billion DM in 1966 to 23.5 billion in 1968, 63 per cent above the 1964 peak. This recovery was due to very large purchases by commercial banks. In 1967, 81 per cent of net bond issues were taken up by the banking system (73 per cent by commercial banks and 8 per cent by the Bundesbank through open market operations). In 1968, the share of commercial banks was 67 per cent, the Bundesbank being a net seller on a small scale. Private households, which in previous years had accounted for one third of total net purchases, bought only 14 per cent in the first half of 1968.

Thus the explanation of the developments on the

GERMANY :
CURRENT BALANCE AND PRIVATE LONG-TERM CAPITAL



Source : Deutsche Bundesbank, Monthly Reports.

bond market during the 1965-1968 cycle is more complex than is frequently believed. The main lesson seems to be that too much reliance on credit policy leads to excessive fluctuations on the market, not only because bank purchases of securities are affected by monetary policy; there may also be an unfavourable impact on private household investments. From the point of view of capital market policies, more orderly and progressive adaptation of bond market developments to the aims of monetary policy seems desirable and should be attainable with the existing instruments, in particular with a more effective use of fiscal policy.

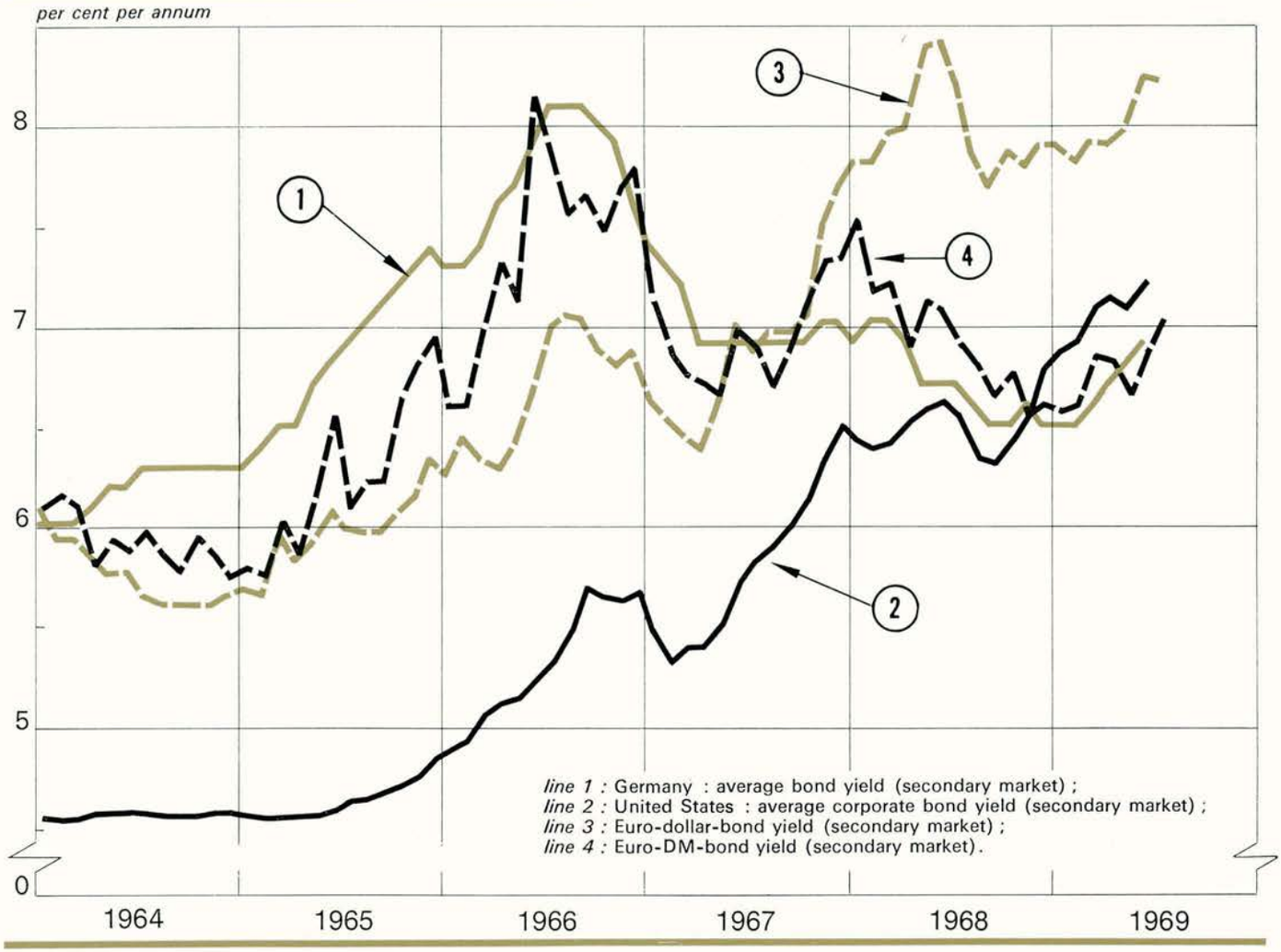
Problems of the Share Market

The German authorities, the banks and the stock exchanges have been trying for some time to stimulate greater interest on the part of the general public in the share market. A number of practical steps were taken to this end; others are under discussion.

Fiscal measures were introduced to encourage the distribution of dividends and the transformation of company reserves into share capital. Shares of Government-owned concerns were offered to the public, sometimes on terms which were particularly attractive to the small saver *(Volksaktien)*. In order to enlarge the public market, the banks abandoned their practice of " marrying " buying and selling orders internally and began to channel all customers' security transactions through the stock exchanges, unless otherwise instructed by their clients. Promotion of investment funds has been greatly intensified. Banks and security dealers are constantly trying to improve their advisory services and the trading facilities at the disposal of private investors.

In this latter context, foreign banks, brokerage firms and investment funds have introduced a number of dynamic innovations and stimulated competition. There have in fact been many changes in this field recently and this development appears to be welcome to the authorities, not only because it benefits the investing public and the markets as a whole, but also because it has led to substantial portfolio investment abroad at times when the export of capital was officially encouraged.

LONG-TERM INTEREST RATE DEVELOPMENTS



Germany has become a very important exporter of private long-term capital. After having risen to the remarkably high level of $2.5 billion in 1968, outflows reached almost the same figure for the first half of 1969 alone, by far exceeding the declining surplus on current account. (See chart page 6). This situation is in marked contrast to previous periods when exports of goods and services were not matched by capital exports or were even accompanied by long-term capital imports.

One major factor behind this turnaround is the activity in the market for foreign DM-bonds. Prior to 1967 such issues were sold largely abroad which meant that Germany functioned mainly as a turntable for foreign portfolio capital. In the course of 1968, however, the market showed an extraordinary expansion, foreign DM issues reaching DM 5.7 billion (25 per cent of total bond issues in Germany) and since such issues became highly attractive to German investors, two-thirds of the total were placed in Germany thus constituting a capital outflow. Issuing activity intensified further in 1969, and new foreign DM issues rose to DM 3.8 billion in the first half of the year with German investors taking almost three-quarters of the total.

These developments are largely conected with interest rate movements shown above. Before 1967 foreign DM issues carried interest rates which were considerably lower than those of German domestic bonds and followed generally the interest rate trend in the market for Euro-dollar bonds. This was mainly due to a coupon tax on foreign interest income from holdings of German domestic bonds, announced early in 1964 and enacted early in 1965 which led to a marked shift of non-German demand from German domestic bonds to foreign DM issues. Since late 1967, however, yields on Euro-dollar issues have risen sharply in line with interest rate developments in the United States, while yields on foreign DM bonds have moved more in line with German domestic long-term rates which have fallen substantially since mid-1966. The scissors movement between Euro-DM- and Euro-dollar-bond yields was also influenced by expectations concerning parity changes.

ECONOMETRIC STUDIES TO IMPROVE TRADE FORECASTING

Since foreign trade now accounts for 3 to 34 per cent of the GNP of OECD Member countries, trade flows are one of the most important determinants of the level of economic activity in individual countries, but also one of the most difficult to forecast.
In the following article, F. G. Adams, Associate Professor of Economics and Director of the Economics Research Unit at Wharton School of Finance and Commerce, University of Pennsylvania, and an OECD consultant on short-term forecasting, describes the efforts being made by OECD's Economics and Statistics Department to refine predictions of this important variable.

The rapid growth of world imports and exports increasingly links together the economies of different countries. Trade flows are the principal way in which the business cycle is transmitted from one country to another, and this is also the principal way in which the economic policies of one country (or the failure to apply appropriate economic policies) are felt by its neighbours. These links require policy makers in each country to take account of economic developments elsewhere in the world and of their implications for trade.

The OECD has been especially concerned with the interrelationships between the Member countries in its work on short-term forecasting and policy. In consultation with its Member countries, OECD's Economics and Statistics Department makes forecasts for each country of domestic economic developments and of trade and tries to ensure that national policies are based on a consistent analysis of the likely effects on imports, exports, and international financial flows.

In order to improve the conceptual and quantitative basis of this work, the OECD has been carrying on an extensive programme of studies in international trade. This research is directed at improving understanding of the factors which affect trade flows and of their quantitative relationship. It uses the newest econometric and statistical techniques to improve forecasting. It seeks to make consistent estimates of imports and exports and to work in the direction of a model in which imports, exports and the feedback to the domestic economies are treated simultaneously. One of the results of research efforts has now been published : *An Econometric Analysis of International Trade* (1). It represents a step in the formalisation of trade flow prediction and analysis — a progress report on the continuing research in this area.

Imports and Exports over the Business Cycle

Numerous factors interact to account for the sensitivity of world trade to fluctuations in business activity. This relationship is apparent in the Chart on page 10, which shows imports and exports of the major OECD countries in relation to the movement of industrial production.

As industrial activity expands, imports are required as materials and semi-manufactures for industry, to satisfy consumer and investor demand and for stockbuilding. The response of imports to the cycle is amplified by the pressure of demand on domestic capacity and rising domestic prices, as the business cycle approaches its peak.

On the export side, business cycle factors work in the opposite direction. Producers turn to the home market as domestic business conditions improve. Relative prices and delivery periods become less competitive in world markets as domestic demand pressure builds up.

Long-term factors also affect international competitiveness. For example, the Japanese have been steadily expanding their share of world markets, while the export performance of the UK and of the US has been declining.

The cyclical and long-term elements in the development of imports and exports are important factors in each country's economic situation and the balance of payments.

Empirical Trade Equations and Models

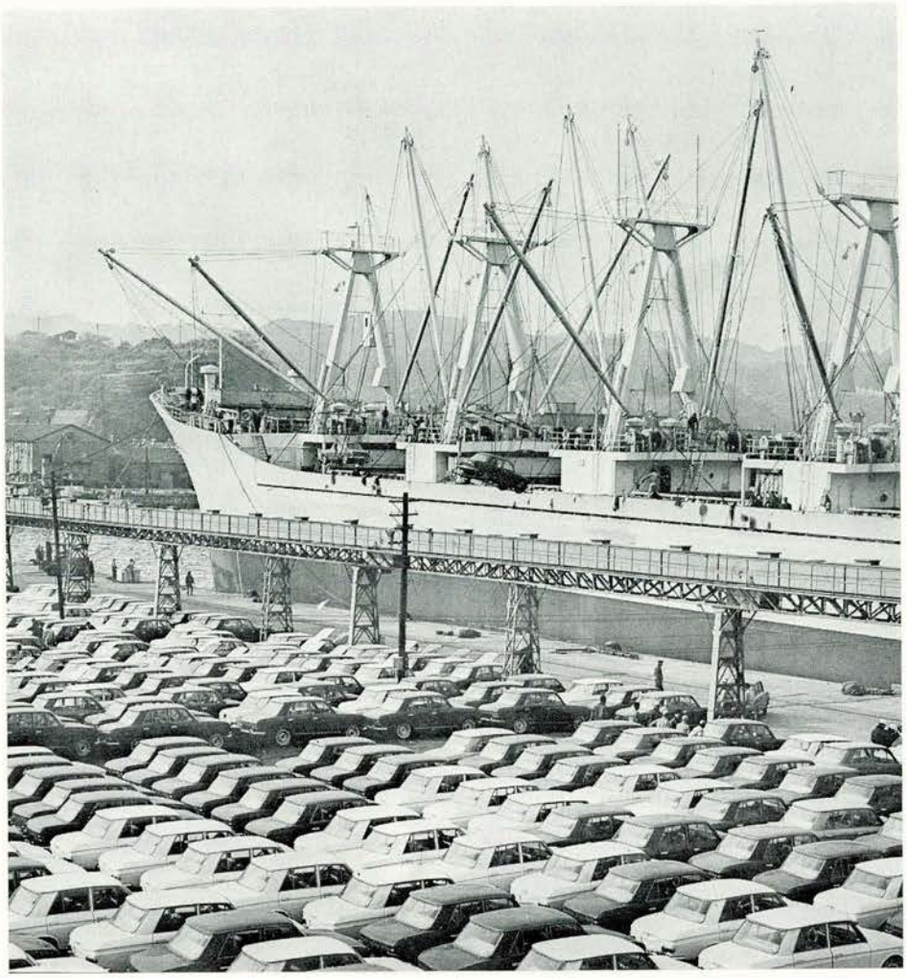
The importance of qualitative judgements in evaluating the economy should not be underestimated, but it is not sufficient to deal with the relationships determining trade only in *qualitative* terms. Modern econometric methods are used to estimate *quantitative* relationships. Statistical import and export functions have been developed from nine major OECD countries, for the "other" OECD area and for the rest of the world. These are the basis for a model of world trade.

In application, once a measurement of economic conditions and prices in each of the countries is established, the model can estimate the volume of

(1) F.G. Adams, H. Eguchi and F Meyer-zu-Schlochtern; *An Econometric Analysis of International Trade : — an interrelated explanation of imports and exports of OECD countries*, OECD Economic Studies Series, Paris, 1969.

commodity imports to each area, and, in turn, using this information as a basis, the model estimates exports from each area.

The model can be applied for forecasting — predicting economic conditions to obtain trade forecasts — or for simulation — testing what would happen under a variety of assumed conditions, This makes it possible to evaluate the performance of imports and exports over the business cycle, or to test the impact of alternative policies on world trade. A simulation exercise is the basis of Table 1, which shows the impact of an increase in business activity in any country on its imports, and, in turn, on the exports of every country. The table shows, for example, that with a one percentage point increase in industrial production in the US, imports will go up 1.98 points (so long as the US economy is in the boom phase of the business cycle). US exports will fall .33 points, because of the increase in pressure of demand, and the exports of France will increase .20, and of other countries will change as indicated. The table, of course, provides only an illustration of the impact of the industrial-production and pressure-of-demand variables. In a real application, the operation of other factors must be taken into account, and



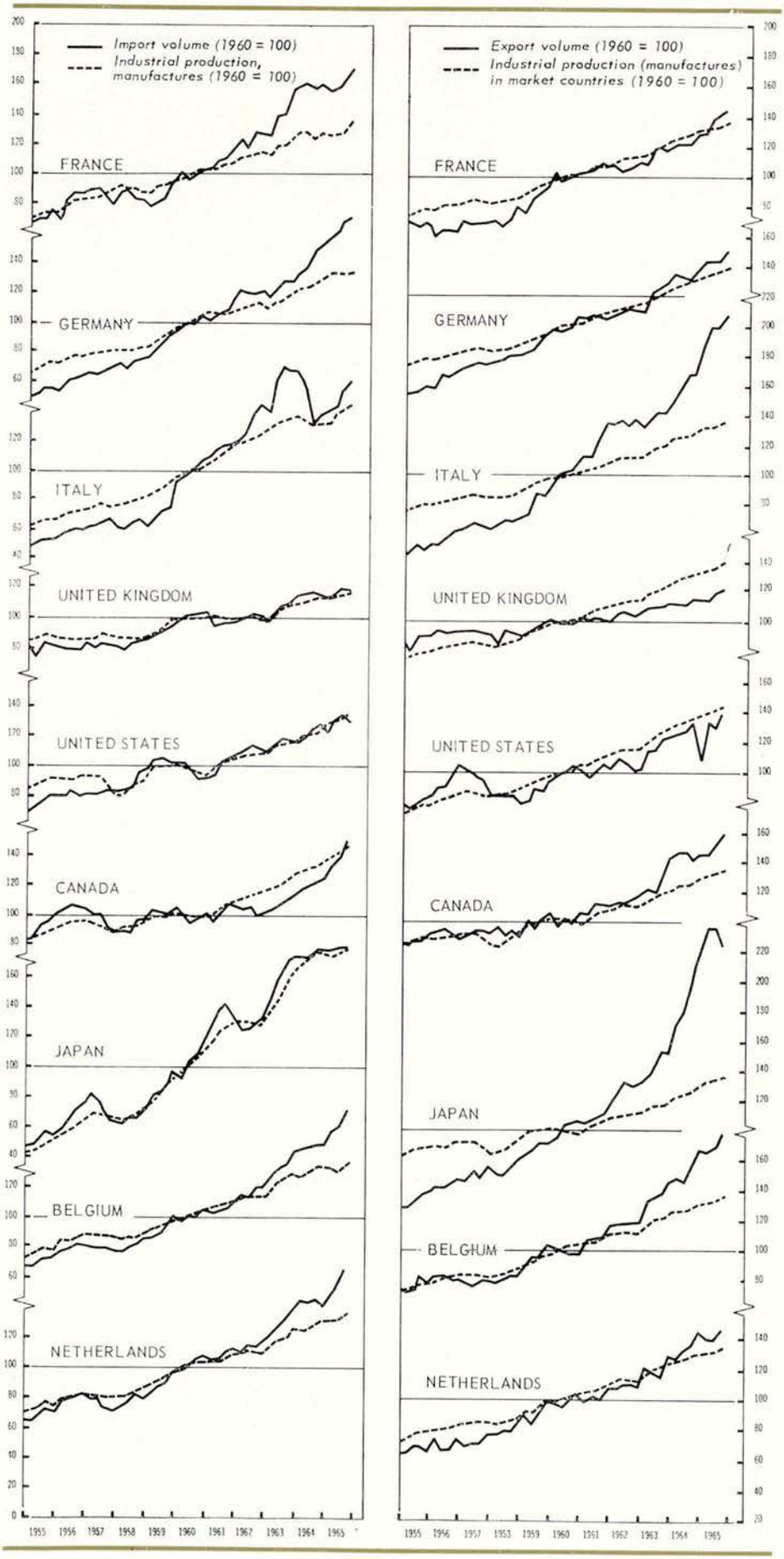
MULTIPLIERS IN TRADE FLOW MODEL: IMPACT OF A CHANGE IN INDUSTRIAL PRODUCTION ON IMPORTS AND EXPORTS(1)

Change in IP of : / Effect on :		Imports	Exports of										
			France	Germany	Italy	United Kingdom	United States	Canada	Japan	Belgium	Netherlands	Other OECD	Non-OECD
France		1.64	—0.45	0.15	0.15	0.08	0.11	0.03	0.01	0.33	0.10	0.08	0.09
Germany		1.59	0.27	—0.08	0.29	0.13	0.19	0.05	0.06	0.51	0.37	0.32	0.10
Italy		2.49	0.16	0.15	—1.19	0.08	0.13	0.03	0.02	0.14	0.08	0.19	0.00
United Kingdom	a	1.38	0.12	0.07	0.17	—0.33	0.22	0.30	0.08	0.22	0.16	0.28	0.16
	b	1.13	0.11	0.06	0.15	—0.33	0.19	0.26	0.07	0.20	0.13	0.23	0.11
United States	a	1.98	0.20	0.18	0.36	0.26	—0.33	1.34	0.83	0.44	0.10	0.20	0.30
	b	0.59	0.12	0.07	0.21	0.13	—0.33	0.56	0.45	0.31	0.03	0.06	0.00
Canada	a	2.35	0.04	0.03	0.08	0.16	0.54	—	0.10	0.08	0.02	0.03	0.04
	b	1.39	0.04	0.02	0.07	0.11	0.43	—	0.07	0.07	0.02	0.02	0.00
Japan	a	1.63	0.03	0.02	0.05	0.03	0.20	0.06	—0.16	0.05	0.01	0.02	0.07
	b	1.20	0.02	0.02	0.05	0.03	0.16	0.05	—0.16	0.05	0.01	0.01	0.04
Belgium		1.21	0.11	0.08	0.05	0.04	0.06	0.02	0.02	—0.77	0.18	0.04	0.01
Netherlands		1.52	0.06	0.14	0.07	0.07	0.10	0.02	0.03	0.58	—	0.07	0.02

a. *Assuming that IP is above its long-range trend.*
b. *Assuming that IP is below its long-range trend.*

(1) Impact in index points (1960 = 100) on volume of commodity imports and exports of a one percentage point increase in industrial production and corresponding changes in pressure of demand variables.

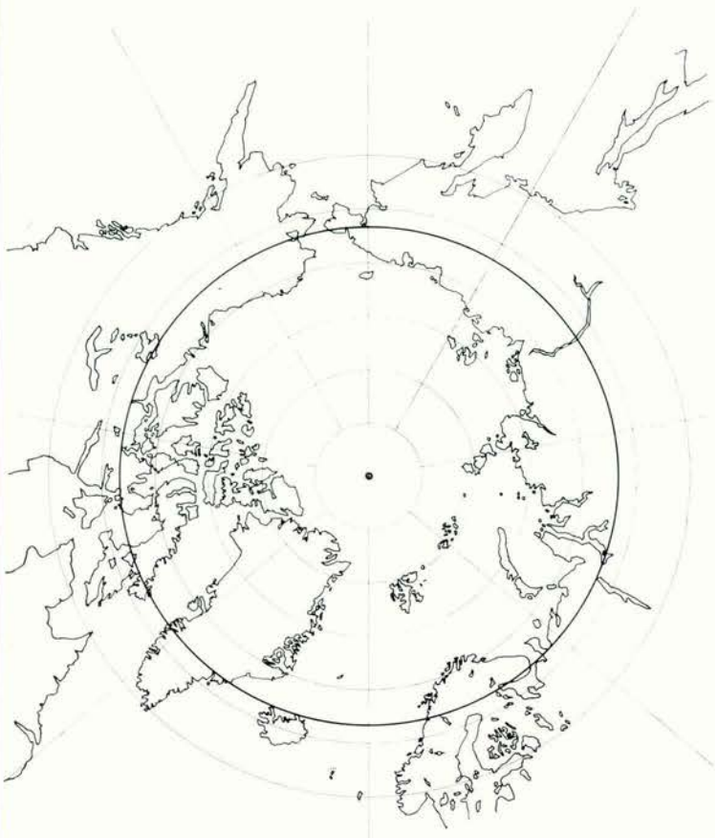
IMPORTS AND EXPORTS IN MAJOR OECD COUNTRIES



judgemental appraisals of prevailing trends also have to be considered. The model is presently being tested in forecasting and policy studies.

The brief description above greatly oversimplifies the difficulties of constructing such a model and of applying it. Construction of the model required extensive experimentation to specify and estimate equations which incorporate theoretical expectations and which explain the past and, it is hoped, predict the future. Application requires adjustment of the system of equations, to keep it in line with the most recent developments, and then estimates of the exogenous variables which go into predictions and simulations. Modern computer facilities make possible the calculations required for estimation and solution of the model.

This exercise is only an early step in developing models of world trade. The limited forecasting experience, so far, has been a guide in a continuous effort to respecify and re-estimate the model in order that it may become a practical tool for use in the OECD short-term forecasting operation. There are also other important possibilities for improved trade models, but at a cost, in most cases, of greatly increased complexity. One important improvement, for example, is to introduce a feedback mechanism into the model, so that trade flows will have a feedback effect on economic activity and that, in turn, on trade. Work in this direction is being carried on at OECD, and academic research bodies and several international organisations are co-operating on a major project to provide such feedback by linking econometric models for many countries. Other important possibilities involve greater disaggregation, such as breakdown by commodities, or improved analysis of trade flows on a "from whom to whom" basis. Studies of the trade relationships between developed and developing countries, for example, are a particularly important challenge. The invisibles and capital movements components of the balance of payments also pose difficult econometric problems. Much work is still required to perfect models of world trade. This will involve not only much new empirical research, but, in many cases, will require new data now being developed by various governments and international agencies on trade and capital flows and on import and export prices.



PROBLEMS OF THE FISHERIES OF NORTHERN COUNTRIES

Seven OECD Member countries have territories which fall within or near the Arctic Circle — Canada, Denmark (Greenland), Finland, Iceland, Norway, Sweden and the US (Alaska). The mainstay of the people is the fish stocks of the nearby waters. Fisheries in these regions are now suffering some common difficulties which are touched upon in OECD's 1968 Review of Fisheries, just published, and expanded upon in the following article by L.G.B. Butcher of OECD's Fisheries Division.

Taking an astronaut's view of the Earth from above the North Pole, the Arctic Circle can be visualised traversing Norway, Sweden, Finland, Alaska (US), Canada, Greenland (Denmark) and the northern tip of Iceland, all members of the OECD. While it is quite wrong to regard the Arctic regions within those countries as icy wastes, it is true that their natural wealth recedes the nearer they are to the Arctic Ocean. Sometime in the near future this situation might change as a result of continuing prospecting and exploration, but at present the mainstay of the northern peoples continues to be the fish stocks that congregate in the adjacent waters.

These stocks, insofar as they lie outside established fishery limits, are also fished by the fleets of more distant European nations, but it is with those countries near the fishing grounds, and remote from the main marketing centres, that this article is principally concerned. Also included, because of geographical, environmental and industrial similarity are the east Canadian coastal areas on the Atlantic.

In assessing the contribution of fisheries to the economies of the Northern regions, the Icelandic situation, while not representative of that of all the Northern countries, can be considered typical for extensive regions such as Finnmark (Norway), Newfoundland, Greenland and the Faroe Islands; in Iceland the percentage of exports accounted for by fish has ranged from 87 to 94 per cent since 1963.

The main types of fisheries on which the Northern countries have until now been depending are in broad terms twofold, namely fish destined for direct human consumption and fish specifically caught for use as raw material for factories producing either fishmeal or oil or both. Basic species for the former are in the cod family and for the latter among densely shoaling fish, like herring, mackerel and capelin. Examination of production figures over the years will show that whereas cod and the like vary comparatively little in volume, catches of herring, etc. can fluctuate considerably from one year to another.

Apart from the small proportion used for home consumption (which per caput is very high), external trade of the Arctic peoples centres round exports of produce of these fisheries, and here the Icelandic experience is indicative for all. In the four years 1963 to 1966 a continuous upward trend can be seen in the export of fish and fish products until the 1966 value is 50 per cent higher than the comparable value in 1963. Then in 1967 the whole gain is lost and a further recession follows in 1968.

To find the cause and effect of these movements, it is necessary to turn to primary production and examine the various influences at work. Table 1 shows the landings by certain countries of the species forming the bulk of the North Atlantic catch.

Immediately it has to be emphasised that any of the annual levels of production could probably have been attained using much the same strength of manpower, vessels and gear. That is to say, the Norwegian fishing fleet and crews landing 2 million tons of fish for reduction in 1966 would not have been very different in size and number from those

1. PRODUCTION OF ATLANTIC COD AND FISH REDUCED TO MEAL AND OIL 1963-1968

('000 **tons live weight**)

	COD						REDUCTION					
	1963	1964	1965	1966	1967	1968	1963	1964	1965	1966	1967	1968
North Atlantic :												
Canada	334	316	313	306	284	318	115	142	184	249	346	520
Greenland	24	23	25	30	31	23	—	—	—	—	—	—
Iceland	240	281	244	231	204	234	279	472	717	804	476	137
Norway	277	225	274	288	291	340	561	868	1483	1990	2403	1982
Faroes	106	103	93	91	90	86	13	19	35	62	64	62
Sub-total I	981	948	949	946	900	1001	968	1501	2419	3105	3289	2701
Denmark	69	68	49	90	93	102	(585)	(543)	(535)	(553)	(784)	(1158)
France	158	165	164	176	185	178						
Germany	208	176	210	208	239	—						
Portugal	230	228	197	202	209	225						
Spain	217	221	227	233	280	340						
United Kingdom	385	361	381	387	421	447						
Total OECD	2248	2167	2177	2242	2327	2293						
Total for all countries	2965	2676	2765	2872	3106	—						
Percentage	75.8	80.9	78.7	78.0	74.9	—						

Source : *FAO Statistical Year Book.*

yielding 2.4 million tons in 1967 and again 2 million tons in 1968.

As to processing capacity, the Icelandic reduction plants coping with 800,000 tons of herring and capelin in 1966 were still there and able to absorb an equal quantity in 1967 and again in 1968 when the raw material handled fell to 476,000 tons and 137,000 tons respectively. The same problems are also met from day to day in the cod fishery, but over a longer term the pattern is more regular since one year's supply of cod seldom varies by more than 10 per cent from another. Therein lie two of the fishing industry's perennial quandaries, (i) how to cope with the daily fluctuations in the supply of food fish for which the preserving process has to be completed while the fish is still fresh and (ii) how to cater for sudden abundance which may or may not endure. A glance at the production of fish for reduction in any country over the period 1963-1968 (Table 1) will suffice to demonstrate the extent of the problem.

But such difficulties are more or less common to all fisheries; it is when the products come to be marketed that the Northern countries are at a disadvantage. The fact that practically the whole production has to be sold abroad thus discounts, at least to some extent, any benefits from the proximity of the fish stocks. Depending on the type of the commodity, the main outlets can lie in Western Europe and North America or in tropical or semi-tropical lands but only rarely are they easily accessible to the producing nations. And distance is not only a question of additional transport costs (which are in fact of only moderate importance) but of complicating the distribution of what is originally a highly perishable food.

For the latter reason, the commodities from Northern countries entering the international trade in fish are mainly those with a lengthy shelf-life made possible by costly preservation in one form or another (freezing, salting, drying, canning). To these may be added accelerated-freeze-drying (AFD), at present more or less restricted to shellfish, and perhaps irradiation, which has yet to be perfected and universally accepted in the sanitary sense.

Through time the Northern industries have of necessity developed their external trade in fish to an extraordinary degree, and it often transpires that if one market is upset, any detrimental effect is cushioned by buoyancy in another. Of late, however, there has been coincidental depression of a variety of outlets which, allied to adverse production factors, has had widespread effects.

The signs of decline were first discernible in 1966 after a prolonged spell of strong demand, mounting prices and, for herring, sustained production. Where production was giving cause for anxiety, as in the cod fisheries, the economic impact was being partially absorbed by an apparently well-established upward price trend, particularly in the highly important US market for frozen fillets.

At the risk of over-simplifying, it is possible to say that setbacks were felt in four of the main export markets either simultaneously or at short intervals. Affected were those for (i) frozen fish of the cod family, (ii) dried and salted cod fish, (iii) fish meal and (iv) fish oil. With frozen fish it seemed to start in the USA when the mounting prices being paid for blocks of cod fillets helped to stimulate a more intensive production in the most important supplying countries among which are those here being considered. It is debatable if the overall production was in fact excessive but, in any case, before long prices fell sharply and until now there has been no evidence of sustained recovery.

In such circumstances, a switch to production of salted or dried cod might have been expected; these

commodities have for long found favour in some tropical areas and elsewhere and have supported a profitable outlet which normally would absorb considerable quantities. A move in this direction was, in fact, noticeable, but a combination of changed currency values in the West Indies and the disruption, caused by war, of the Nigerian market had such a depressing effect that this outlet, too, became progressively unattractive.

In the meantime, declines had also started in the market prices for fish meal and oil, commodities which are not only produced globally in virtually unpredictable volume but are also in direct competition with a variety of substitutes of animal or vegetable origin. The extent of the decline in unit values was in the region of 20 per cent from 1966 to the end of 1968, according to the recently published OECD Review of Fisheries.

The decline eventually had a positive effect by making fish meal and oil more favourably priced than competing commodities and kept the volumes of trade at a high level for those who could maintain or increase their productivity. Examples of the latter were Canada, Denmark and, for certain species, Norway. On the other hand, the herring fisheries of Iceland and Norway suffered both from falling catches and falling prices which were to have unfavourable consequences on the relevant economies.

Iceland's fish exports in value terms rose annually from 1963 until in 1966 they were worth 50 per cent more. Then came a quick decline arising partly from production factors and partly from the deteriorating marketing conditions noted above. The situation in 1968 gave an export value well below that achieved six years previously and undoubtedly was a major contributory factor in the devaluation of the Icelandic Krona by 35.2 per cent on 11th November, 1968. A year previously the Krona had been devalued by 24 per cent at the same time as the pound.

Something approaching the Icelandic situation has had a most disturbing impact on other remote regions heavily reliant on coastal fisheries in northern seas, though in some cases the consequences of

Salting herring in an Icelandic fishing port.

2. EXPORTS OF FROZEN FILLETS, FISHMEAL AND OIL 1963-1968

(Quantity : '000 metric tons — Value : U.S. $ million)

	1963		1964		1965		1966		1967		1968	
	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value	Quantity	Value
Iceland :												
frozen fillets	46.6	20.2	54.2	25.5	49.1	26.7	40.9	24.6	40.7	20.5	48.3	24.4
fishmeal	100.0	13.2	120.0	17.9	150.0	25.7	17.0	29.9	133.0	19.0	62.0	7.5
fish oil	63.5	8.7	62.2	11.8	88.5	17.3	130.4	21.8	79.0	10.4	34.0	4.2
Norway :												
frozen fillets	47.4	21.8	48.1	21.8	67.7	34.0	64.4	34.8	62.6	31.1	84.0	41.5
fishmeal	100.0	15.0	180.0	26.1	260.0	46.7	260.0	47.4	495.0	74.4	425.0	59.9
fish oil	23.5	4.7	22.6	5.3	54.8	11.8	99.9	18.3	185.0	23.4	73.0	6.4
Canada :												
frozen fillets	72.0	36.9	87.0	45.1	98.8	55.4	99.9	57.8	100.5	54.2	103.0	..
fishmeal	43.0	6.1	47.5	6.9	38.1	6.3	34.8	6.5	48.5	7.4	93.2	10.5
fish oil	5.8	0.6	14.4	2.5	6.8	1.4	3.5	0.7	5.4	0.8	..	..
Faroes :												
frozen fillets									8.0	3.5	4.3	2.0
fishmeal									11.8	1.8	14.0	1.2
fish oil									7.1	0.9	8.0	0.7

Source : *FAO and National Statistics.*

depressed price movements were alleviated to some extent by better catches. From Table 1 it will be seen that Canada's production of raw material for reduction to fish meal and oil shows an annual increase of varying proportions but ending with a 1968 catch more than four times higher than that of 1963. Norway, although also suffering in 1968 from a much reduced catch of herring and mackerel can show a still considerable throughput of some 2,000,000 tons. Denmark, the other main producing country in OECD, increases her catch for reduction to 1,160,000 tons.

With the production of cod remaining relatively constant, it is more difficult to make good the income lost through declining prices. From Table 2 it can be seen that Norway's expanding exports of frozen fillets were bringing little extra in cash terms. In fact, so unsatisfactory was the state of the market for frozen fillets that early in 1969 the Canadian Government felt obliged to intervene by using its Prices Support Board in an effort aimed at stabilising returns to processors and fishermen.

These developments are but part of the constantly widening ramifications of the international trade in fish and fish products, in which, because of its inherently speculative nature, periodic upsets are to be expected. But as time goes on, recessions hit more and more people, frequently those who can ill afford the losses involved. This is particularly true when applied to the fishing folk in northern regions who rely so much on their fish exports to maintain their balance of payments.

The typical Arctic fisherman is among the most efficient catchers in the world, employing modern vessels equipped with the most up-to-date gear and navigational and fish-finding instruments and highly skilled in their use. Frequently he is to be found in developing countries, passing on his inbred knowledge to those who are only on the threshold of establishing their own commercial fisheries. In processing and marketing too he is up to date and forward-looking.

But his vulnerability to fish stock and market depressions is particularly pronounced and these usually stem from factors over which he has little, if any, control.

When faced with low yields, he is in much the same straits as his fellow fishermen everywhere insofar as this is one of the hazards of his calling in which it is difficult to decide whether man's depredations have contributed more than natural inconsistencies and deviations or vice versa. Certainly where, in the north, a condition of poor catch returns prevails, it cannot be improved by injections of increased effort and the lack of alternative employment precludes the following of more lucrative pursuits.

As to depressed markets, whatever the cause (and this is a matter for continuing investigation by the Committee for Fisheries) the catcher is again to a large extent powerless in providing a remedy under conditions which become more complex as international trade expands.

On the other hand, the Arctic countries can take part in corporate action to correct adverse developments. To this end they can make use of their membership of such bodies as the Commissions charged with conservation of fish stocks and, on the marketing side, those concerned wholly or partly in the removal of impediments to trade.

WATER AS A GROWTH FACTOR

The increasing rate of industrialisation and urbanisation is producing a series of relatively new problems for society which arise from the interplay of these developments with science and technology. The stream of people coming off the land is causing a continual overloading of all facilities of urban life : houses, hospitals, schools, roads cannot be built fast enough to meet the demands of new residents of the cities.

To the sources of personal unhappiness to which these lacks give rise, must be added the unplanned and undesired fall-out from new technology to which society is now exposed. In some areas rain contains acids that affect plant-life; the air has chemicals in it which may encourage emphysema and chronic bronchitis; water contains oil slicks, detergent foam and chemicals which kill fish and wild life that prey on the fish, and can turn rivers, lakes and reservoirs into unhealthy swamps.

As part of the programme of the OECD Committee for Research Co-operation, this last aspect — problems of water research — has been under study since 1961; water, both as to quantity and quality, has become a potential inhibitor of economic growth.

Water pollution was the initial concern of this work, but since 1965 the orientation of OECD work in this respect has evolved : it now embraces all aspects of research policy and programmes of direct concern to national water management authorities.

The Water Management Research Group, set up by the Committee for Research Co-operation in 1967, has now completed its first report, on which this article is based.

Problems of the provision of adequate water supplies to the growing urban regions, and of prevention of pollution, are now endemic and worldwide. The growing demand on local resources resulting from agricultural, industrial and urban development, have led to the realisation of the need to plan and manage water comprehensively as a national or international resource. The economic investment in water is already large, and likely to rise significantly to support planned economic developments, and as a result of the growing public demand for improved amenities.

The former piecemeal approach has been replaced by a new approach, the most significant feature of which is the development of integrated planning and control of complete river basins. The concept of overall systems control is a relative newcomer to water management, and research is essential to the better understanding of the contribution of the many factors, physical, economic and social, to the total system behaviour. As this study progresses, deficiencies in scientific understanding become evident.

Up to the time of the establishment of the Water Management Research Group (WMRG) the management research area did not figure in any existing international activity, though water is the subject of considerable international activity as regards legislation, policy, technology and exchange of research results.

At the start of its work, therefore, the Group — consisting of senior officials concerned with water policy formulation and research in progress from 18 countries and observers from other international organisations — began with two major lines of investigation:

- preliminary exploration in the problem of integrated river basin management, carried out by means of visits to a number of member countries of the Group;
- the drawing up of a short list of research priorities of wide mutual interest from among research topics of high importance to countries individually.

Research Priorities

Starting from an original list of 30 - 40 priority research problems, and from national replies to a questionnaire on these problems, a decision was agreed upon by the Group on five broad priority areas for study and investigation of needs on an international basis:

- water quality management (with special attention to eutrophication of lakes and reservoirs, and selected pollutants);
- predictability of industrial water needs;
- documentation and management information;

Pollution of the Rhine in the month of June caused massive poisoning of fish.

- national programmes of research;
- research on integrated river basin management.

The first stages of active co-operation in research between countries have been concerned with the first three of these priorities; integrated river basin management, probably the key research area, is perhaps the aspect requiring the most advanced study.

PROGRESS IN WMRG's WORK

Water Quality Management

Water cannot be absolutely pure: its natural constituents vary, and after use the range of substances it contains is greatly increased. The objective is to provide a satisfactory **quality** of water for specific uses: probably the most exacting one is for drinking. With the growing interest in the conservation of natural amenities there is an additional demand that their value should not be arbitrarily destroyed by industrialisation, urbanisation, and agricultural practices.

The quality of water impoundments, whether natural or man-made, is being affected to an increasing extent by the phenomenon of eutrophication (accelerated aging leading to excessive algal growth, water deterioration and asphyxiation) which is accelerated by the nutrient materials added to the water through human activity, particularly discharge of wastes, and run-off from fertilised agricultural land. A survey of research in progress showed the lack of knowledge of the effects produced by different nutrient loads; although considerable observational data exist, many are on a non-comparative basis, and are not adequate to predict the development of eutrophication in different environments.

As the result of a meeting on large lakes and impoundments organised in Sweden in conjunction with the Swedish Royal Commission on Natural Resources, and attended by 50 delegates from ten OECD countries, the WMRG has agreed that the management of lakes and reservoirs, as regards the quality of the water, is a high priority area for research on the dynamics of the processes involved and on techniques to limit the nutrient input. The WMRG has referred to an **ad hoc** expert meeting the task of developing research proposals and presenting recommendations for international co-operation in research on these problems.

Further studies on water pollution, in addition to a number already carried out under OECD auspices, are planned to take place during 1969. One of these is the definition of a standard analytical test procedure needed with the legislation directed towards the elimination of the so-called "hard detergents", which are resistant to natural processes of purification or conventional methods of treatment. This is not only important to the public in general, but has a special interest for producers of detergents who have to satisfy themselves that their products meet the varying requirements at present existing in different countries on standards of biodegradability.

Specific Pollutants in Water

These pollutants, generally chemical substances such as: phenols, pesticides, detergents etc., are particularly harmful to water quality, even in low concentration. The effects and possible dangers of these trace substances will be studied in relation to the quality standards for water.

Predictability of industrial Water Needs

The growing demand for water by industry, being a measure of the economic development and constituting an important propor-

tion of total demand, will be a determining factor in investment and regional development. The forecasting of total future demand cannot be realistically assessed by extrapolation of present usage, since this demand is sensitive to different factors such as price of water (and taxation of waste water) and industrial processes (for production of 1 ton of steel, the water consumption varies from 1 to 300 cubic meters according to the steelworks; the difference is in fact mainly explained by cooling and recycling processes).

The Group has decided that initial study should be focussed on those industries in which water consumption is greatest, or resulting pollution most serious, as being of main significance for water management. Research in depth on difficult questions such as the interaction of the variables acting on the demand, and the predictability of the consumer response, has not been undertaken before.

A bilateral Anglo-French study, which experts of other interested countries will be later invited to join, is undertaking this task.

Documentation and Management Information

Some fifteen to thirty thousand articles on water problems are published annually, in various languages and in several hundred periodicals. The problems of selecting, translating and abstracting such a mass of documentation are formidable. For a number of purposes — drafting new legislation, drawing up working regulations, the initiation and allocation of research tasks, appraisal of the value to water management policy of the results of research — those responsible for administration must inevitably rely on up-to-date and accurate scientific information.

After a preliminary study aimed at defining the problems in organising an international exchange of abstracts of articles between existing national centres of documentation, the WMGR is now embarking on a study to specify clearly the nature of information required from a national information system on water.

National Programmes of Research

The Group noted that there was often limited information in the government of countries concerning the water research in progress in the different institutes or laboratories (entirely or partly financed with the public funds). This gap is detrimental to research management on a national and international basis as well as to research co-operation. Attention has been called to the fact that it is often more useful to know the

(continued on page 18)

WATER MANAGEMENT AND WATER POLLUTION

Water is relatively abundant in many of the OECD countries, but the demand has increased so rapidly (about 5 per cent per year) that it is often used many times over by different users from the time a river starts its course until it reaches the sea (up to ten times in the Trent Valley in England). If present trends continue, the results of this increasing demand will lead, in the next ten years, to local crises in water supply in most OECD countries.

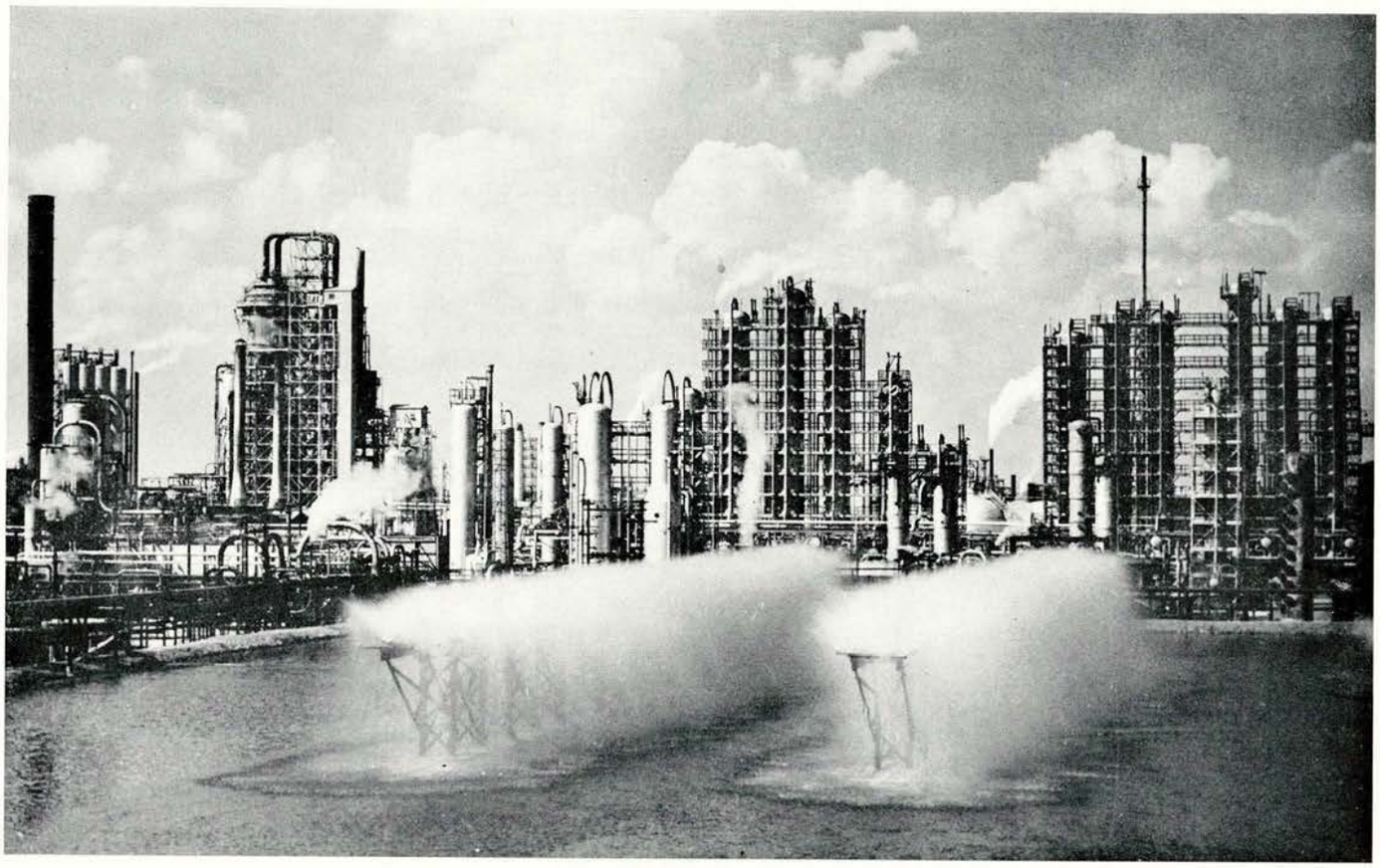
While local crises of supply of many other goods and services are a regular part of an economy and may be accepted as a local inconvenience, a local water supply crisis is much more serious because water for drinking is an absolute necessity and water requirements for agriculture and industry are only to a very limited extent elastic over the short term. Furthermore, if a water supply shortage develops in an area, in contrast to other shortages which may be quickly corrected, it may take a number of years to overcome it—in the meantime severely limiting economic development of the area, since an adequate supply of water is a necessary condition for industrial growth (for example, SE England must now plan for its water requirements for the year 2000).

Traditionally, water usage in the OECD Member countries has been based on proprietary rights to take and use water, with a growing complex of restrictions on the return of water in a polluted state to the water courses, and a point-by-point solution to the growing demand of community supplies to extract water remote from their own local resources. Generally speaking, management of water resources has been very much a local responsibility with appeal to central government and national political machinery to resolve major conflicts of interest to satisfy the growing demands of high density population areas. The deficiencies in this approach have, in the last ten years, or in some cases earlier, been recognised in the majority of OECD Member countries. Changes in organisation have taken place, or are taking place, which recognise the need to take account of conflicting demands for water treated as a total national resource; a change in administration which normally has required legislation permitting both the withdrawal and discharge to be subject to licensing.

This has not been a rapid change, since it affects traditional private rights so fundamentally. The new administrative approach was launched in the United States, for example, by the Water Resources Planning Act in 1965, which called for the development of Federal Co-ordinating Authorities, in England by the water Resources Act of 1963; in Sweden by the formation of the National Swedish Conservancy Office in 1968. Similar co-ordinating functions are being exercised by the Secrétariat Permanent de l'Eau in France. These organisational changes are necessarily adapted to the situation in each country, and represent often different approaches to the same problem. As they develop, there is an increasing appreciation of our deficiency in the understanding of the relationship between the multiple utilisation of water and the water system as a whole.

The principal issue in water management is how to manage the supply and quality of water provided to many users simultaneously, where the consequences of one use are related to the possibilities of other uses. Who shall pay what price for taking water of a certain quality, and what quality water shall be allowed to be returned to the system ? With increasing demand, maintenance of quality is of critical importance since, with the exploitation of the readily accessible sources of water, new supplementary supply may easily involve large capital expenditures. This implies the planning of the use of the water system as a whole to ensure maximum capability of re-use and has led to a rapid development of what is called "integrated river basin management" in many Member countries and the clear indication of the need for this approach if economic development plans are not to be checked through local water shortages.

The developing situation calls also for an ability to plan at international level. Even with the best available technology in water treatment, many areas must depend on the transport of water from areas of lower demand. In fact all OECD countries face the need to plan for a high percentage entrapment and stockage of the total precipitation, 60 per cent or more, if low flow conditions in the summer are not to give rise to serious economic dislocation in industry and general loss of public amenity.



In many countries efforts are being made by industry to purify water before recirculating it.

research in progress or planned than that which is already completed. General surveys (directories) of research on water have been compiled already in some OECD countries such as Canada and the United States, and have proved to be very useful.

As a first stage of action, the Group developed an exchange of information reviewing the existing information on programmes of research as well as on the scale of research expenditure in different countries. A longer term objective could be a degree of coordination between countries in preparation of such national surveys of research within a comparable frame-work. This will be a first step towards examining the management of research, which has been agreed by the Group as in itself a main priority topic.

Research on Integrated River Basin Management

The WMRG has recognised that integrated basin management, and the associated planning for the best use of water resources, are basic areas for continuing analysis and research. Different approaches have been developing towards basin management in different countries, the accent varying between such factors as economics, agriculture, or industrial interests. The management of water for a specific use, such as hydro-electric power is distinctly different from the concept of an integrated system for all purposes within a hydrological area.

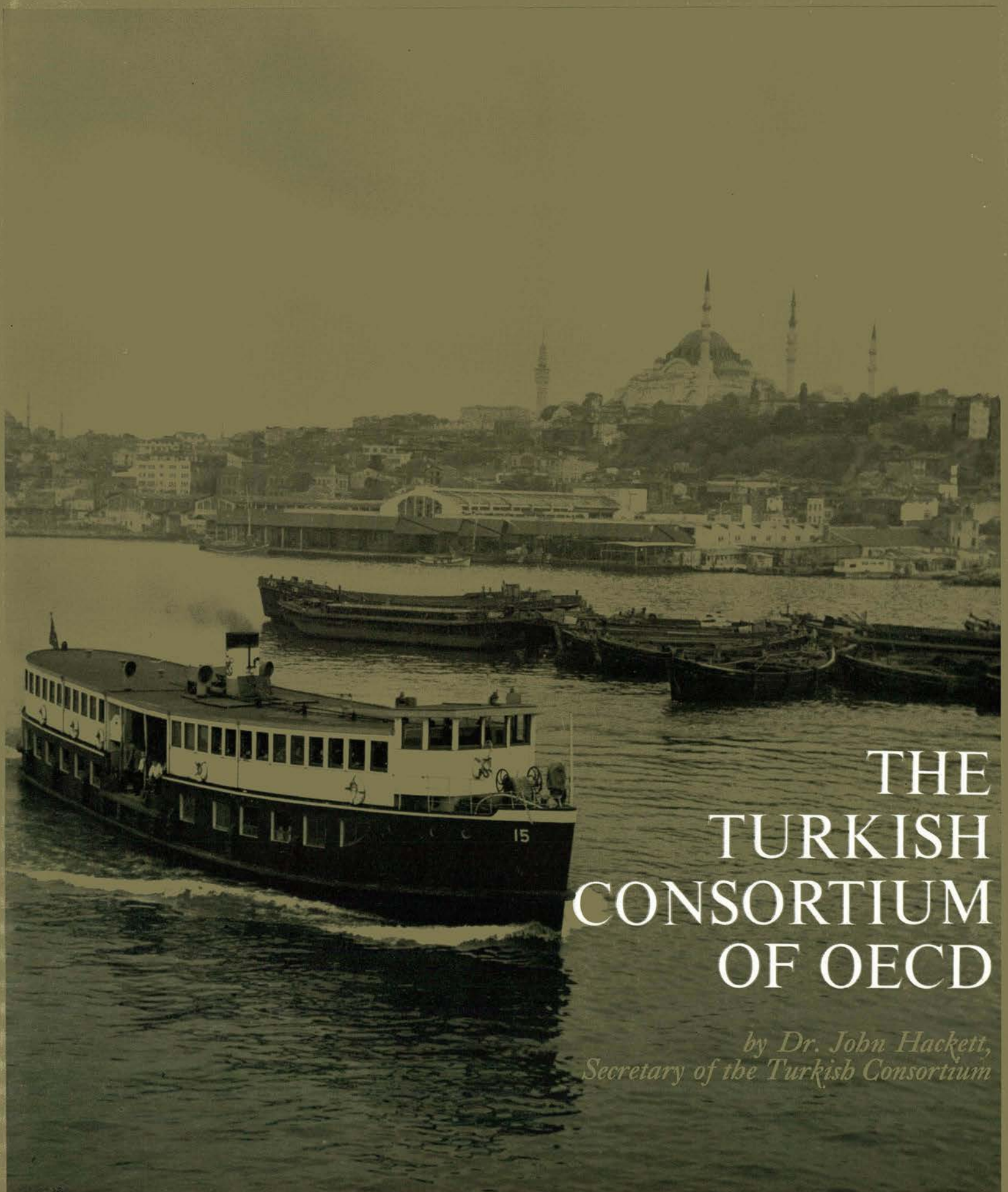
The Group is now seeking to define the technical factors to which the system is sensitive and to ascertain the inter-relationship between those that govern the situation: already it is clear that not enough is known about the influence on management decision and control of pricing policies, quality requirements, and the value to be placed on amenity.

The procedures adopted during 1968 have placed at the disposal of the Group considerable information which is now in process of analysis. When this analysis is completed, the WMRG will be enabled to select certain specific research aspects of integrated river basin management and define them for more detailed study.

The WMRG has established itself as an effective instrument for promoting co-operation between countries on water management research. In order to avoid overlapping it consults other international organisations—consultations have already been established with the World Health Organisation, the Commission of the European Communities, the Council of Europe and the United Nations Economic Commission for Europe —whose competence includes aspects of water problems. Procedures have been adopted which concentrate aspects of the work in countries best able to deal with them at each stage, with a reporting procedure to the WMRG to ensure that all countries are kept informed of the results of such studies.

A number of WRMG meetings are to take place during 1969, at which the principal subjects of discussion will be integrated river basin management and eutrophication and industrial water problems.

A Co-ordinated Approach to Development Aid:



THE TURKISH CONSORTIUM OF OECD

by Dr. John Hackett,
Secretary of the Turkish Consortium

THE 1960s have witnessed a welcome, though still too modest, rise in the flow of aid from the developed to the developing areas. At the same time, in part cause and in part effect of the same process, aid programmes have become increasingly institutionalised. Practically all the developed countries have set up government departments or agencies to deal with aid questions, some of them headed by a minister with a seat in the cabinet. Internationally, the previously existing world-wide agencies—notably the World Bank—have increased considerably the scope of their activities and a number of new ones with a regional vocation have appeared in Europe, Latin America, Africa and Asia. Nowadays there is hardly a developing country that is not the recipient of some capital on concessionary terms, and most are receiving aid from a variety of sources. And all the major industrial countries are operating multi-country aid programmes on a world-wide basis. It was in such a context that the need came to be felt by aid-givers and by aid-recipients alike for a co-ordinated approach to development aid. At the overall level, the Development Aid Committee of the OECD, UNCTAD I and II and, shortly, the United Nations' Second Development Decade, are the major forums for reaching common objectives and guidelines for aid policies. At the operational level, where the specific problems of a particular developing country have to be considered, solutions have been sought by setting-up various "consortia", "syndicates" and "consultative groups". A description of the aims and modus operandi of these new entities in international affairs goes beyond the scope of this article(1). But a brief survey of how one of them—the Turkish Aid Consortium —came into being, how it operates and what it has achieved may serve to illustrate the salient features of such operational exercises in aid co-ordination.

Origins

The early 1960s were a turning-point in post-war thinking and action on development issues. An aid consortium for India was set up in 1958, followed in 1960 by one for Pakistan. The role of co-ordinator for these first two consortia was entrusted to the World Bank. The realisation that the Western European countries, grouped since 1948 in the Organisation for European Economic Co-operation, as it was then called, also included countries with severe development problems was contemporaneous with the events just described, in particular as far as Turkey was concerned.

Turkey benefitted after the war first from Marshall-Plan aid to Europe and then from a continuing American bilateral aid-programme, both economic and military. During the 1950s, faulty allocation of resources and inflation led to growing tightness of foreign exchange and finally, in 1958, to the need for special assistance from abroad to restore order to the country's economic affairs in the framework of a stabilisation programme. Substantial credits were granted by a number of Western European countries and the United States as well as by the International Monetary Fund and the European Payments Union (the forerunner of the present-day European Monetary Agreement). Shortly afterwards, some $ 400 million foreign commercial credits falling due over the next few years were consolidated under a multilateral commercial credits agreement. By then, it was becoming apparent that the position of Turkey was very different from that of the overwhelming majority of OEEC countries. If present-day terminology had been current at the time, Turkey would have been characterised as a low-income develop-

(1) See the Annual Report of the Development Assistance Committee of the OECD, 1967, Chapter 8, for a discussion of co-ordinating arrangements in general.

CONSORTIUM ASSISTANCE TO TURKEY, 1963-1968

($ million)

Country or Institution	Type of aid*	Agreements signed	Disbursements	Unused portion at end of 1968
		A	B	C
Austria	1	6.2	5.1	1.1
Belgium	1	9.3	9.3	—
Canada	2	22.7	4.9	17.8
Denmark	1	2.0	1.6	0.4
France	1	49.8	29.2	20.6
	2	49.8	8.3	41.5
Germany	1	231.8	230.5	1.3
	2	43.0	17.2	25.8
Italy	1	51.4	42.4	9.0
	2	29.0	18.0	11.0
Luxembourg	1	—	—	—
Netherlands	1	10.3	9.5	0.8
Norway	1	2.3	2.3	—
Sweden	2	5.0	3.0	2.0
Switzerland	1	8.7	7.7	1.0
	2	28.1	1.1	27.0
United Kingdom	1	88.7	81.3	7.4
	2	15.3	8.7	6.6
United States	1	401.4	415.1	24.4**
	2	282.9	256.3	186.5**
World Bank (IBRD/IDA/IFC)	2	112.8	77.1	40.7**
Eur. Inv. Bank	2	128.3	59.7	68.6
European Fund	1	200.0	200.0	—
TOTAL	1	1,061.9	1,034.0	66.0**
	2	716.9	454.3	427.5**
	1 + 2	1,778.8	1,488.3	493.5**

**1 = Programme aid and debt relief.*
2 = Project aid.
*** Because of existing pipeline at the end of 1962, C is not equal to A-B.*

ing country with a structural imbalance on external account, an imbalance which was singularly aggravated by the presence of a heavy foreign debt-service burden.

A diagnosis of the real dimensions of the Turkish problem did not lead immediately, either in Turkey or abroad, to a specific strategy for dealing with it. But, after 1960, the United States did raise substantially the size of their bilateral aid-programme and Germany granted one of her first aid credits to Turkey in 1960/61. In Turkey, after 1961, successive governments set their faces against inflationary financing of development, created a new governmental agency—the State Planning Organisation—to draft a five-year development plan and prohibited the contracting abroad of fresh supplier credits

Backed up by this policy, the government of Turkey approached its European and North American partners to explore ways and means of securing soundly based external financing for the new departure in development that was thus envisaged. After a period of examination and discussion the reply was forthcoming in the form of the resolution of 11th July, 1962, of the Council of the OECD—as it had then become—setting up a special working party on the long-term development problems of Turkey. The working party was to seek ways and means of mobilising support for the Turkish development plan "including the creation of a consortium as soon as possible". The Consortium for Turkey met for the first time in October 1962(1), in the beginning with nine Member countries of OECD, a number which rose fairly soon to fourteen (2), plus the World Bank and the International Monetary Fund, the Common Market and the European Investment Bank, the last three organisations attending as observers. Membership of the Consortium remains open to other countries who may express their desire to join and their willingness to make regular financial contributions to assist Turkish development.

This brief historical sketch suggests the following as prime factors leading to the creation of an aid consortium for Turkey. The Turkish problem was finally seen by a sufficient number of OECD countries for what it is, i. e. a long-haul problem of economic development. The amount of external financing that was likely to be needed was more than any one country or institution could provide. Turkey advanced, as proof of the seriousness of her intentions, the new economic policy that had been formulated over the years after 1958 and clearly stated her desire to see her OECD partners devise such a concerted approach. These features are common more or less to all consortia and consultative group experiments but, as an examination of the activities of the Turkish case will show, an aid consortium is a more highly structured arrangement than the consultative groups.

Activities

Probably the most enlightening answer to the question "what is an aid consortium ?" is to explain what it does, or sets out to do. But an attempt at definition may nevertheless be useful. An aid consortium is, then, a grouping of countries and aid-granting institutions who have undertaken to concert their efforts so as to make available to a developing country, on a continuing basis, assistance at concessional terms. The words "concert", "continuing" and "concessional" express the essence of an aid-consortium exercise.

The Members of the Turkish Consortium *concert* when they confide to a single agent—in this case the OECD—the task of organising the Consortium; when they meet periodically to inform themselves about Turkey's plans, policy intentions, achievements and needs; when they seek to reach a common understanding on specific guidelines for their aid policies towards Turkey.

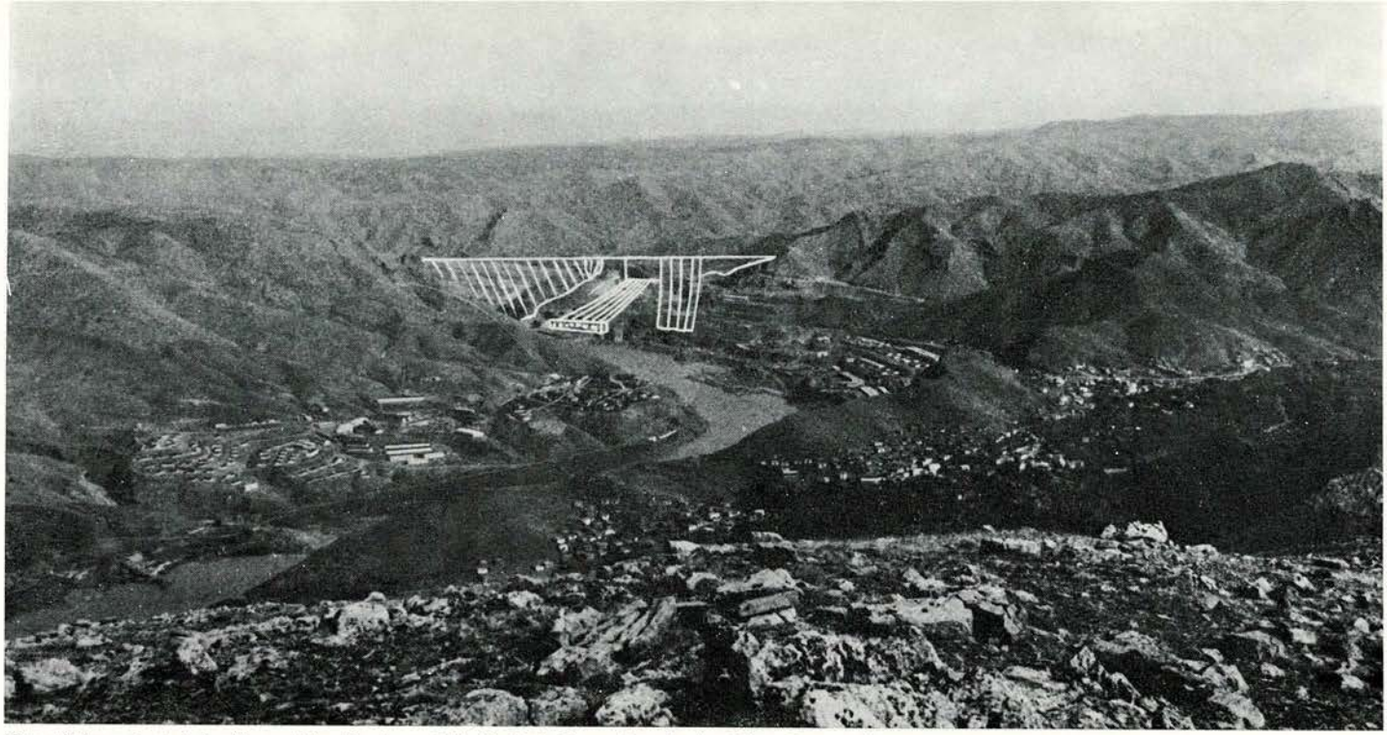
From the beginning, the management of the Turkish Consortium was conceived on a small scale and, since then, it has defied the working of Parkinson's Law in that today it is still made up only of a Chairman and Secretary, two administrators and two secretaries. The Chairman is a full-time independent personality and is not a Member of the OECD Secretariat. However, Mr. H. von Mangoldt-Reiboldt, who was chairman from 1963 to 1967 had been closely associated with the OEEC since the beginning and had been Chairman of the European Payments Union and joint author of a Three Wise Men's report in 1961 that had first proposed the setting-up a Consortium for Turkey. The present Chairman, Dr Günther Keiser, played a key role as Assistant Secretary-General of OECD in the setting-up of the Consortium before returning to the German administration from which he retired upon taking up his present functions in 1967. The Secretary and the staff of the Consortium are all permanent members of the OECD Secretariat. The present management contains a representative spread of the nationalities of the countries participating in the exercise—German, British, French and Turkish.

As a full-time Member of the OECD, Turkey participates in all the activities of the Organisation as regards confrontation of economic policies (see inset for the results of this year's examination) and the more specialised activities. Through their common participation in the work of the committees of the OECD there is a regular contact between the Members of the Consortium and Turkey's representatives. Like the other OECD members, Turkey maintains a permanent national delegation in Paris which is also responsible for day-to-day contacts with the management of the Consortium.

The Consortium meets as a rule three times a year. The first meeting takes place in December when the details of Turkey's economic policy for the coming year, and her estimate of the need for external financing have been fixed. At that meeting also the management of

(1) The same year an aid consortium for Greece was set up.

(2) Austria, Belgium, Canada, Denmark, France, the Federal Republic of Germany, Italy, Luxembourg, the Netherlands, Norway, Sweden, Switzerland, the United Kingdom, the United States.



One of the projects being financed by Members of the Turkish Consortium is the Keban Dam and power station on the Euphrates River which involves a foreign exchange cost of $135 million.

the Consortium, following a study visit to Turkey, presents an evaluation of the Turkish programme, A delegation of senior Turkish officials from the various economic departments attends and participates in the ensuing discussion. In addition to these reviews of the annual programme, wide-ranging exchanges of views took place when the First and Second Five-Year Plans of Turkey were ready for implementation. These five-year plans provide a framework for the annual programmes, as they are called. But, as in all countries, the medium-term plans have to be adapted as time goes by to events and to the changing nature of economic problems.

Some indications of the likely level of Member countries' contributions for the coming year may be given at the December meeting. But for the most part, this is too early for Member countries who at that time have not yet completed the preparation of their aid budgets. So firm promises of aid—or "pledges" as they are called—are not made until some two or three months later, at a further meeting of the Consortium. Despite best efforts, the aim of completing pledging of aid before the Spring of each year is not always achieved, in which case the Summer meeting of the Consortium, at which current economic trends and the working-out of the policy laid down earlier in the year are discussed, provides an opportunity to do so. Discussions between Turkey and Members of the Consortium leading to the signature of specific loan agreements are conducted bilaterally.

By these means the Members of the Consortium are supplied on a regular basis with systematic analyses of Turkey's position, prospects and policies. Even the larger countries, which have expert staff who can devote time to following events in the countries being assisted, find this practice a useful one and it is indispensable for the smaller countries. For Turkey, this procedure makes for an economy of time and effort by avoiding unnecessary duplication in presenting her case to aid-granting countries.

The importance of the personal element in the new art of "aid diplomacy" which is implied in the work of a consortium should be stressed. Frequent meetings and exchanges of views among aid administrators in the various countries and institutions represented in the Consortium create a climate of opinion that the recipient country can benefit from, particularly if its own representation is able to inspire the confidence and respect of such administrators whose views are often decisive when it comes to deciding on aid policy.

From time to time the Consortium uses the procedure of working groups to deal with special issues, for example the preparatory work for the 1965-67 debt-relief exercise or discussions on project-aid in 1966. Another formula is the "syndicate" which is a limited group of interested countries and institutions which is set up to find ways and means of financing jointly a particularly large project. Two such syndicates exist at the present time, in respect of the Keban Dam being built on the Euphrates River and to finance the construction of a bridge over the Bosphorus. The syndicates meet periodically to discuss and reach agreement on the various financial, legal and technical matters that arise in connection with the implementation of such large, complex investment projects. This work calls for the expertise that only a specialised investment bank can provide. In the case of the Keban Dam the World Bank and the European Investment Bank shared this work. The agent for the Bosphorus bridge project is the European Investment Bank.

It is a basic feature of an aid consortium that it operates on a *continuing* basis. Once the development nature of the Turkish balance of payments had been recognised, a shot-in-the-arm approach to the problem was precluded by definition. Turkey herself has tended to consider that her balance of payments will be in a viable state during the Third Plan which will cover the years 1973-77, and the studies made by the Secretariat of the Consortium certainly do not suggest any

earlier date. The Members of the Consortium have accepted this sort of time-horizon, although there is no binding commitment on any country to remain in the Consortium during that time. The advantage for Turkey of this tacit understanding to pursue the Consortium exercise has been, and continues to be, substantial. It distinguishes the consortium-type of exercise from the "consultative groups" whose membership is more fluctuating.

Continuity in making firm pledges of aid which are publicly announced is another feature of an aid consortium and one which does not exist in other looser groupings. Thanks to the annual pledging exercises already described, a greater degree of regularity in the flow of resources to Turkey has been secured than would have been possible otherwise. Such regularity is, of course, a prerequisite for informed forward planning by the recipient country. The continuous character of aid flows has two aspects: providing finance for indispensable current imports and promoting investment in real assets. The present structure of Turkey's balance of payments shows a need for convertible currencies to pay for current imports and to service foreign debts in an amount that exceeds current earnings from exports and invisibles. Unless part of the assistance provided through the Consortium can be used to make such payments, industry will lack the raw materials and semi-finished goods it needs to fully use existing capacity. Securing an acceptable volume of pledges of "programme aid", as it is called, is one of the main tasks of the annual aid-pledging process.

There remains aid to finance specific investment projects where the funds made available are disbursed over a period of years. It might seem at first sight that the need for regular pledging is less urgent in the case of project aid. But as it is the intention of the Turkish authorities, an intention which is in conformity with the preferences of the main aid-donors, progressively to switch aid to the financing of projects, it is necessary for Turkey to build up a "portfolio" of such projects. To do this, new project loans should, for some time, exceed the amounts disbursed in respect of earlier project credits.

The *concessional* aspect of aid programmes as regards intererest rates, grace and maturity periods has been, and continues to be, the object of extensive debate among developed countries themselves and between the latter and the developing countries. The Development Aid Committee of the OECD has proposed as a target which aid-giving countries should strive to reach sets of aid terms that are equivalent to at least a 61 per cent "grant element"(1). This year, six Member countries(2) of the Turkish Consortium reached or exceeded this target, which is a notable improvement compared with 1963 when only one country, the United States, was offering a grant element higher than 61 per cent. The average "grant element" for all loans and grants in 1967—the latest year for which comparable data are available—was 63 per cent which was a lower figure than in the case of India (72 per cent), which is, of course, a much poorer country than Turkey, but higher than such countries as Pakistan (51 per cent), Indonesia (56 per cent), Tunisia (52 per cent) and Greece (15 per cent). The consensus of opinion among Members is that Turkey's balance of payments position and prospects, taking into account the burden of servicing foreign debt, justify the softest credit terms possible and in general countries now extend to Turkey the most favourable treatment their legislation permits.

Irrigation of land around Adana, a project that has received support from the World Bank, has made possible a large increase in the acreage devoted to cotton which is now Turkey's largest single export.

Achievements

The aim of an aid consortium is ultimately to make itself superfluous because the country in receipt of assistance can begin to fend for itself; in other words, it has established a viable balance of payments structure. This is one point upon which aid recipients and donors alike can agree, the former because, other things being equal, governments would presumably prefer not to have to solicit loans on concessional terms; the latter because in the present state of international aid policies there are always more eligible claimants than there are funds to allocate to soft loans.

An assessment of the progress of the Turkish economy since the Consortium exercise began would go beyond the scope of this article (3) and a few examples must suffice. The years since 1963 have witnessed the most rapid and sustained period of growth of GNP in the history of the Republic, of the order of 6.5 per cent a year which, of course, is much less per head (under 4 per cent) once the rapid growth of population is allowed for. Investment as a share of GNP has

(1) For an explanation of the term "grant element" the reader is referred to the 1968 Report by the Chairman of the Development Aid Committee of the OECD, Annex II.

(2) Denmark, Germany, Netherlands, Sweden, United Kingdom, United States.

(3) The reader is referred to the two most recent surveys of Turkey published in the series OECD Economic Surveys in July 1968 and July 1969 (See inset).

been pushed up to 21 per cent whereas it was only 14 per cent during the period 1959-62. Domestic savings finance over 90 per cent of this total compared with 85 per cent from 1959 to 1962. Consolidated budget revenues were 13 per cent of GNP in the late 1950s. They are now 18 per cent. Exports (plus tourism and emigrant receipts (1) financed just under 70 per cent of imports in the years 1959-62 and 78 per cent from 1963 to 1967. New, diversified industrial structures are emerging as a result of the boom in recent years in private entrepreneurship. Agriculture is now feeling the impact of the introduction of increased fertiliser use, improved water availabilities and new hybrid seeds.

The next stage of Turkey's development raises new problems whose main points of focus will be improving the efficiency with which available resources, including receipts of concessional aid, are used and boosting Turkey's own earnings of foreign exchange so as to catch up with the level of performance in this respect of other countries around the Mediterranean. The measure of Turkey's success in respect of these two aims of policy will be the determining factor deciding how soon the goal of external viability will be reached.

The total amount of aid agreed to in the framework of the Consortium during the period 1963-68 was $1.8 billion and $1.5 billion were disbursed. Taking account of some $200 million of aid that were "in the pipeline" when the Consortium began to function in 1963, the amount of undisbursed assistance on 31st December, 1968 was nearly $500 million, over $400 million in the form of project aid (2). This sum represents a reserve of foreign currency upon which Turkey will be drawing over the next few years as investment pro-

(continued on page 26)

(1) There are at present nearly 200,000 Turkish nationals working abroad, for the most part in Germany, who send most of their savings back to Turkey

(2) These figures exclude project aid being supplied from non-Consortium sources, notably the USSR where a framework agreement for a total of $200 million has been signed.

CONCLUSIONS OF THE OECD ECONOMIC DEVELOPMENT AND REVIEW COMMITTEE

Some of the problems facing Turkish policy makers in the years to come are spelled out in a review of the Turkish economy in 1969 carried out by OECD's Economic Development and Review Committee; the following are the Committee's conclusions.

It is the essence of good economic policy-making to ensure that targets, and the policies designed to achieve them, are kept under continuous review. A vital element in this process is the feed-back from experience gained in the past. In broad terms it may be said that events during the present decade have confirmed the presence in Turkey of a dynamic favourable to development which has now been sufficiently aroused to constitute a reatively independent force in the economy. This is true whether one considers the striking boom in private industry in the main urban centres or trends in the agricultural sector. In terms of the attitudes and aspirations of the population and of the structures of production, Turkey is today a different sort of economy from the one that prevailed as recently as a decade ago. It is natural and desirable that goverment policy should adapt itself to the changed circumstances so as to facilitate the continued development of the economy.

The immediate future tasks of the Turkish authorities in the field of economic policy may be summarised under three headings.

a) *Firstly, there is a need to consolidate some of the gains of the last few years:*

- *To the extent that, for various reasons, many investment schemes that it was planned to begin during the First Five-Year Plan got started only during the last three years, there is at present a certain bunching of investment in the public sector that needs to be digested. To do this means that, for the time being, new projects in the public sector must be subjected to careful scrutiny to ensure that only those with an early return or which are indispensable as a foundation for the continued growth of output during the 1970's are approved;*
- *The aim of policy this year, to secure a balanced budget without net recourse, except for seasonal purposes, to the Central Bank is clearly appropriate in present circumstances and should be pursued energetically;*
- *The budget has become overburdened in recent years with a number of support schemes and transfer items in the general and annexed budgets whose contribution to economic and social development is dubious or nil. The urgent need to sharpen the impact of the budget as an instrument of economic development and demand-management policy calls for a thorough scrutiny of such items of expenditure so as to free resources for purposes with a higher priority. In this regard the work being done to introduce programme budget techniques provides a useful starting point;*
- *The aim of the Turkish authorities is quite properly to avoid as far as possible applying unnecessary checks to the further growth and diversification of productive activities in the private*

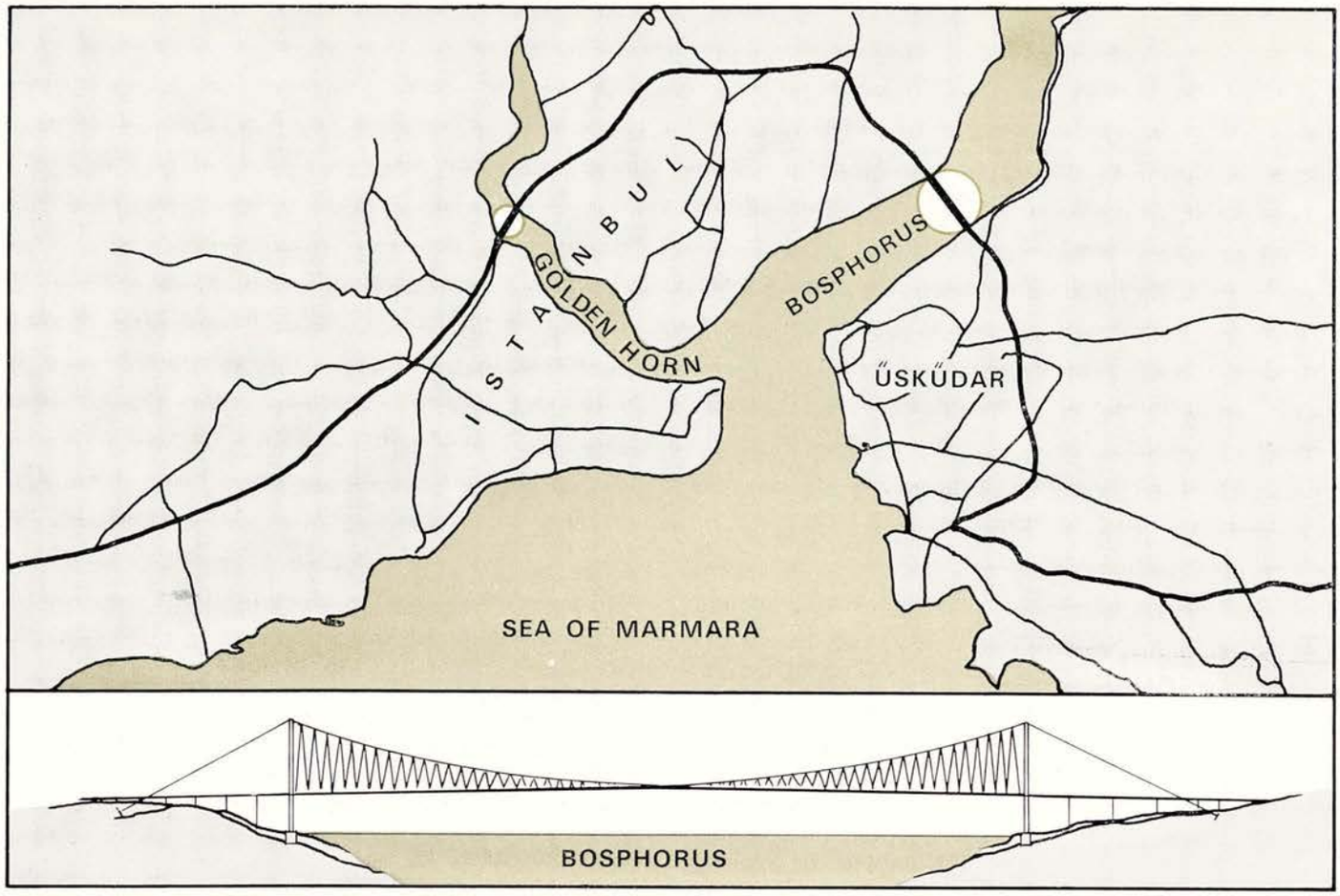
sector. There exist now a number of incentives — monetary and fiscal in particular — to which private entrepreneurs are responding favourably. Through its powers to grant, or to refuse, access to such incentives the Government can exert a powerful influence over the course of industrial development. It would appear an appropriate time, now that a "take-off" in the field of private manufacturing industry has begun to manifest itself, to envisage a co-ordinated policy for industry based on the most promising lines of development. These lines would include in priority boosting exports and meeting successfully more competition from imports. Such a policy would naturally encompass, in addition to the existing incentives, ways of introducing technical "know-how" and modern managerial techniques and effective sales methods, and of improving training facilities for staff and manual workers.

b) *Secondly, a certain redeployment of resources is indicated:*

- *The more selective approach to the investment programmes of the public sector that was announced in the 1969 Annual Programme provides a basis for such a redeployment. Thus new manufacturing projects could most appropriately be reserved, in principle, for the private sector. Infrastructure investments need to be scrutinised with care over the next few years. The railway network is uneconomic on some lines and there is excess staff that could be moved elsewhere, to the new port facilities for example. A similar redeployment of part of the labour force in the coalmines will probably be needed also;*
- *In agriculture, shifting production away from sugar beet and tobacco to livestock, fodder, fresh fruit and vegetables should absorb from now on a growing share of resources. These lines would have the advantage of being strongly export-oriented;*
- *The same is true of the development of Turkey's natural resources in mining — copper and other minerals — and forestry which are only now beginning to receive the priority treatment they merit.*

c) *Thirdly, a number of basic policy measures are called for to improve the efficiency with which economic resources are allocated.*

- *As to fiscal policy the conclusion appears inescapable that a shift in the centre of gravity of the Turkish fiscal system from indirect taxation, and in particular taxation of imports, towards taxation of domestic production and incomes is required. The developmental as well as the short-term demand management aspects of budgetary and fiscal policy would benefit from such a change;*
- *Monetary and credit mechanisms are becoming increasingly important for the efficient collection of savings and their channelling to those best able to make use of them. The changes introduced recently as regards credits for exporters and the encouragement of more medium-term credit granting by the commercial banks are steps in the right direction. The new law on the Central Bank, which can hopefully be expected to come into force before the end of the present year, will be an important contribution to the modernisation of Turkey's monetary policy instruments. The organisation of a capital market and the encouragement of new forms of contractual savings will also be on the future agenda of economic policy-makers;*
- *Some aspects of the problem of the State Enterprises were studied in depth by the reorganisation committee whose report contains many specific suggestions for reform and the introduction of new methods. There remains the stage of application of these recommendations which seems to have got off to a slow start. Policies towards the three main deficit enterprises — the railways, coalmines and sugar industry — have already been noted. In addition, it may be that a new institutional set-up for the State Enterprises that would be more conducive than the present one to improved efficiency by giving managers more real freedom to conduct day-to-day affairs will be required;*
- *The best hope for creating a viable economy in Turkey during the 1970's lies in an increasing integration with the outside world. The treaty of association with the Common Market offers one way of opening the economy to the outside, the costs and benefits of which cannot be measured solely in terms of hypothetical repercussions of tariff and quota changes either on Turkey's export or import trade. Also Turkey is seeking to expand her economic relations with her immediate neighbours in the Middle East where new opportunities for Turkish exports undoubtedly exist. For producers really to become export-minded, the help of the Government will be needed, firstly to provide a suitable climate in which exporting becomes a profitable activity, secondly, to assist Turkish exporters with the usual range of ancillary services from which their counterparts abroad benefit already;*
- *Tourism is beginning to show results in terms of numbers of foreign visitors but the net foreign exchange procured for the official reserves is still negligible. Turkey is the only OECD country with a Mediterranean coastline to be in such a position. More energetic measures to collect the foreign currencies exchanged by tourists would be possible. More generally, a better articulated policy for the development of the tourist coastal areas is needed as a matter of urgency to prevent the further spread of haphazard schemes which are already threatening the natural beauty of some areas.*



Another major project, financed in this case by Members of the Consortium plus Japan, includes a bridge over the Bosphorus, which will link European and Asian Turkey for the first time, and a smaller bridge over the Golden Horn; the two will be connected by a highway which skirts the most heavily built-up areas of Istanbul and Usküdar.

jects at present underway are completed. Meanwhile, the project aid pipeline will be replenished by new agreements as they are signed.

The level of disbursements of project aid has been rising sharply since 1966 as a number of projects planned for earlier years at last entered an active phase of implementation, from $60 million in 1966 to $124 million in 1968 and probably at least $150 million this year. It seems that new projects for an amount of some $200 million will be agreed to this year (1). As this figure exceeds the likely level of disbursements, the pipeline of project aid will increase by an amount equal to the difference between the two.

Bilateral programme aid and debt relief disbursements (2) were $85 million in 1968. This year pledges to provide this form of aid will probably reach some $100 million. In addition, in both years Turkey received credits from the International Monetary Fund and the European Fund. The above amounts are large but they are gross of repayments of debt by Turkey, which were $91 million in 1968 for example.

It would be surprising, and a unique example in aid policies, if the performance of the Consortium, measured in terms of the concessional aid that has been marshalled, came up exactly to Turkey's own estimate of her needs. The existence of the Consortium does not and cannot imply a binding advance commitment on the Member countries and organisations to provide a stated amount of concessional aid either each year or, still less, over a longer period. Countries with aid programmes have multiple claims on their resources—domestic as well as international—that can change rapidly. Although there are welcome signs in some countries of an awareness of the need to plan aid programmes some years ahead, and to protect aid budgets from the vagaries of economic events and policies, planning a global level of aid is not the same thing as earmarking specific amounts for individual recipients. At present, Turkey retains her entire freedom of action to decide on economic policy, on the aid she will accept and on the uses to which such aid will be put. For anything like a binding commitment to supply a level of aid that was fixed in advance to exist, Turkey herself would clearly have to be prepared to co-ordinate her economic policy and plans so as to reach agreed targets. There are no signs that either Turkey or the Members of the Consortium desire to carry their mutual commitments to such a point.

There remains the forum of the Consortium, with an institutional structure that provides certain guaranties of performance and continuity in aid flows as the preceding paragraphs have attempted to show. In an imperfect world this is not a negligible accomplishment.

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(1) Including $30 million for the Bosphorus Bridge project pledged by Japan which, although a Member of the Development Aid Committee of the OECD, has not previously participated in a joint exercise with the Consortium.

(2) Debt relief takes three forms: postponement or refinancing of debts falling due for repayment and additional programme aid in lieu of debt relief.

SCIENCE POLICY IN ITALY

Until the beginning of the 1960*'s Italy had concentrated all its energies on such urgent problems as reconstruction, the adaptation of its economy to entry into the Common Market and the development of the Mezzogiorno. It has only recently come to appreciate the importance of scientific and technical research in the fulfilment of the Government's economic and social objectives. Research and development are therefore undergoing the kind of mutation which is a feature of rapidly expanding countries. In the framework of the national science policy reviews the OECD's Science Policy Committee instructed examiners from three countries (Belgium, the United States and France) to clarify the present situation in Italy (*1*). Their report, together with a Background Report prepared by the OECD Secretariat, has just been published. The following article gives details of some of the research carried out in the public sector, to which the Italian authorities have so far devoted their principal efforts.*

(1) Professor Harvey Brooks, Dean of Engineering and Applied Physics, Harvard University, former member of the President's Science Advisory Committee, United States; Professor Guy Ourisson, Professeur à la Faculté des Sciences de Strasbourg, former member of the Comité Consultatif à la Recherche Scientifique et Technique, France; Doctor Jacques Spaey, Secrétaire Général du Conseil National de la Politique Scientifique, Belgium.

Italy's per capita expenditure on research and development in 1964 amounted to $6.8 compared with $27 in France, $39.8 in the United Kingdom and $110.5 in the United States. Expenditure on research in 1967 still accounted for only 0.8 per cent of GNP (chart 1) compared with 2 per cent in France (1965), 2.3 per cent in the United Kingdom (1965) and 3.4 per cent in the United States (1964).

Public expenditure on research almost trebled between 1963 and 1967, rising from L 66.5 to 181.6 thousand million. The Government's share in the total research effort has also increased, accounting for 48.3 per cent in 1967 compared with 27 per cent in 1963. Measures now being considered or about to be taken show that the Government has decided to intensify its efforts and set up the necessary structures. Between 1966 and 1970 appropriations for research carried out in national institutions should rise from L 123.5 thousand million to L 207.7 thousand million, representing an increase of 68 per cent over five years. The organisation of scientific research in Italy is at present in a transitional phase pending the reforms which will rationalise it and at the same time allow a genuine science policy to emerge.

About 90 per cent of public expenditure on research in 1965 went to fundamental and applied research, compared with 10 per cent to development. Most of the fundamental research in Italy, that is to say 90 per cent (Table 1) is financed by the State and is generally centred on a few key disciplines such as physical science and biology. Applied research and development are mostly concerned with nuclear energy and space, which alone accounted for about 31.2 per cent of total public research in 1967. Human sciences only represented 10.9 per cent of the total and biological and medical science 12.4 per cent.

The public research effort has three main sponsors (Table 2) : the universities, which come under the Ministry of Education, the National Research Council (CNR) and the National Council for Nuclear Energy (CNEN). These three bodies spend between them about 69 per cent of total public expenditure on research and 86.5 per cent of public expenditure within the country.

The Universities

More research is undertaken in the universities than elsewhere since the scientific institutes attached to them form the basic infrastructure of public research in Italy. They are not subject to detailed regulations. The statutes and rules governing them date from a period when research was regarded as a complement to teaching. Although there have been lively discussions in Parliament as well as in the scientific research community, no legal measures have been taken to reorganise this vital sector.

The present statutes determine the number of Faculties, set the basic disciplines and the rules for the degree examinations (" laurea "). They provide for several types of institute where research can be undertaken. Each institute is directed by the holder of a Chair (" di ruolo ") who deals with the administration and supervises the scientific work, but the institutes are not incorporated

1. RESEARCH EXPENDITURE BY SECTOR AND TYPE OF RESEARCH

(in million lire)

Sector	Type of research							
	Fundamental		Applied		Development		Total	
	1963	1965	1963	1965	1963	1965	1963	1965
Public sector	29,496	39,042	22,784	42,563	17,121	8,838	69,401	90,443
Public authorities	2,582	3,585	3,408	3,784	1,801	1,397	7,791	8,766
CNR and CNEN	8,536	15,203	4,920	16,303	14,757	7,100	28,213	38,606
Universities	15,714	15,900	10,335	13,147	303	227	26,352	29,274
Other public establishments	2,664	4,354	4,121	9,329	260	114	7,045	13,797
Private sector	5,497	4,715	49,967	54,005	58,306	72,006	113,770	130,726
State-subsidised enterprises	—	—	5,641	13,354	9,976	10,278	15,617	23,632
Private enterprises	5,497	4,715	44,326	40,651	48,330	61,728	98,153	107,094
TOTAL	34,993	43,757	72,751	96,568	75,427	80,844	183,171	221,169

Source : *ISTAT, La Spesa per la Ricerca Scientifica in Italia negli Anni 1963 e 1965, Rome, 1968.*

2. ALLOCATIONS FOR SCIENTIFIC AND TECHNICAL RESEARCH

(in million lire)

Agency	1965	%	1966	%	1967	%
Ministry of Education	32,191	27.59	39,268	28.16	56,586	31.16
CNR	23,500	20.14	23,500	16.85	32,402	17.84
CNEN	25,000	21.43	26,000	18.65	35,883	19.76
Other Ministries (1)	14,035	11.77	17,016	12.20	19,473	10.72
of which : Health	897		934		1,100	
Defence	7,622		8,547		9,038	
Agriculture	625		1,324		2,236	
TOTAL in Italy	94,726	80.93	105,784	75.86	144,344	79.48
Contributions to international organisations	22,250	19.07	33,666 (2)	24.14	37,273	20.52
GRAND TOTAL	116,976	100	139,450	100	181,617	100

Source: *CNR, Relazione Generale sullo Stato della Ricerca Scientifica e Technologica in Italia 1966, Rome, September 1966 and 1967.*
(1) Including research expenditure by ENEL estimated at L 2,327 million for 1965 and L 4,450 for 1966.
(2) Less L 5.2 thousand million assuming an average contribution of L 5.5 thousand million to ELDO.

and have no financial autonomy. In these circumstances, the director has no authority to develop his research centre himself; he has too few research workers on his staff and even fewer technicians and junior staff.

The scientific administration of the institutes raises two kinds of problems. The institute may be attached to a Chair and directed by the professor who holds that Chair, in which case the direction of the institute is made easier; but the means he has at his disposal are too limited for him to undertake major research.

Alternatively, the institute may come under several Chairs in similar or complementary subjects and may have adequate resources in material and personnel; but then the coordination of the work of the different professors concerned with the activities is difficult since the director has no hierarchical authority over his colleagues.

There were 1,839 scientific institutes attached to the universities in 1958, rising to 2,144 in 1967, although the number of Faculties remained more or less the same (202 and 223). Of these institutes 878 were dependent on 93 scientific and technical Faculties, 610 on 23 Faculties of Medecine and surgery and 615 under the 100 Faculties of economics and human sciences. The experts' view is that the number is excessive and results in duplication. Several of the sectors teaching the same subject have their own institutes and sometimes there are more institutes than professors.

Little attempt has been made to develop co-operation between the universities and industry. For instance, only 1.7 per cent of research expenditure on higher education was financed by business firms. But sometimes co-operation of this kind shows positive results, as, for

example, when the Montecatini Company and Milan Polytechnic Faculty together perfected a new plastic called " Moplen " which can be used for numerous purposes in industry.

The amount needed by the University each year to provide sufficient means for research connected with teaching was estimated in 1966 at L 24.5 thousand million but the actual amount allocated in 1967 was only L 17.8 thousand million. Although there has been an improvemant (L 4 thousand million annually), the Ministry of Education grants are considered to be inadequate and the financing of university research is supplemented directly or indirectly by the National Research Council.

The CNR

The National Research Council (CNR) was reorganised by the Act of 2nd March, 1963 (No. 283) and :

- provides for the installation and conversion of scientific laboratories and finances them so far as its budget allows with the help of other administrations;
- carries out and finances research work of national importance;
- assists the scientific institutes, students and research workers by awarding grants, scholarships and prizes;
- collects bibliographic and documentary matter and any publications needed;
- in conjunction with the Ministry of Foreign Affairs ensures Italy's participation in international scientific and technical organisations;
- in agreement with the administrations concerned provides official standards for the acceptance and standardisation of scientific and technical equipment and for carrying out the necessary installations;
- submits for approval by the President of the Ministerial Council working rules for its own agencies, rules for the setting up and the functioning of its institutes, laboratories and other research organisations and its own working code.

The CNR undertakes direct research in three kinds of agency, namely :

Institutes which are completely dependent (the CNR owns their premises and is directly responsible for their staff, etc.) ; *Laboratories* which generally bring together research workers engaged on inter-disciplinary work and are constituted in the framework of the universities (there are different statutes for the staff, i.e. academic, CNR and contract) and the *study centres* which the CNR can set up at a university of public establishment or even a business firm.

The CNEN

The National Council for Nuclear Energy (CNEN) has several functions such as conducting and promoting studies and experiments in the nuclear and radioactive-material field, exercising scientific and technical supervision over the related activities; controlling nuclear safety and health protection against ionising radiations, promoting the training of experts and developing international co-operation in the nuclear field.

The CNEN is able to finance and subsidise the university institutes and other public institutes for study and research under predetermined programmes. It has a five-year budget (1965-1969) of L 150 thousand million phased to synchronise with the National Economic Plan. In 1967 this budget accounted for 19.76 per cent of total public expenditure on research.

Unlike similar bodies in other countries the CNEN generally devotes most of its resources to fundamental research at its own Centre at Frascati or through the National Institute of Nuclear Physics.

But the CNEN also undertakes guided basic research, which is generally inter-disciplinary research affecting such different sectors as radio-biology. reactor physics and fusion metallurgy, etc. Some of this research is carried out by CNEN staff at its centres under contracts concluded in particular with EURATOM. This basic research should make it possible for the CNEN to provide Italian industry with technical assistance and technology (electronics, nuclear fuel, automation and servo-mechanisms and metallurgy, etc.).

Since the end of 1965 the CNEN has devoted most of its basic research activities to the " major programmes " which are the third aspect of its research. These are strictly programmed research projects directed along two main lines; the construction of a fog-cooled reactor (CIRENE) in co-operation with the National Electricity Board (ENEL) and a fast reactor; there are also three other lines of research (the plutonium programme and the construction of two plants for processing irradiated fuel).

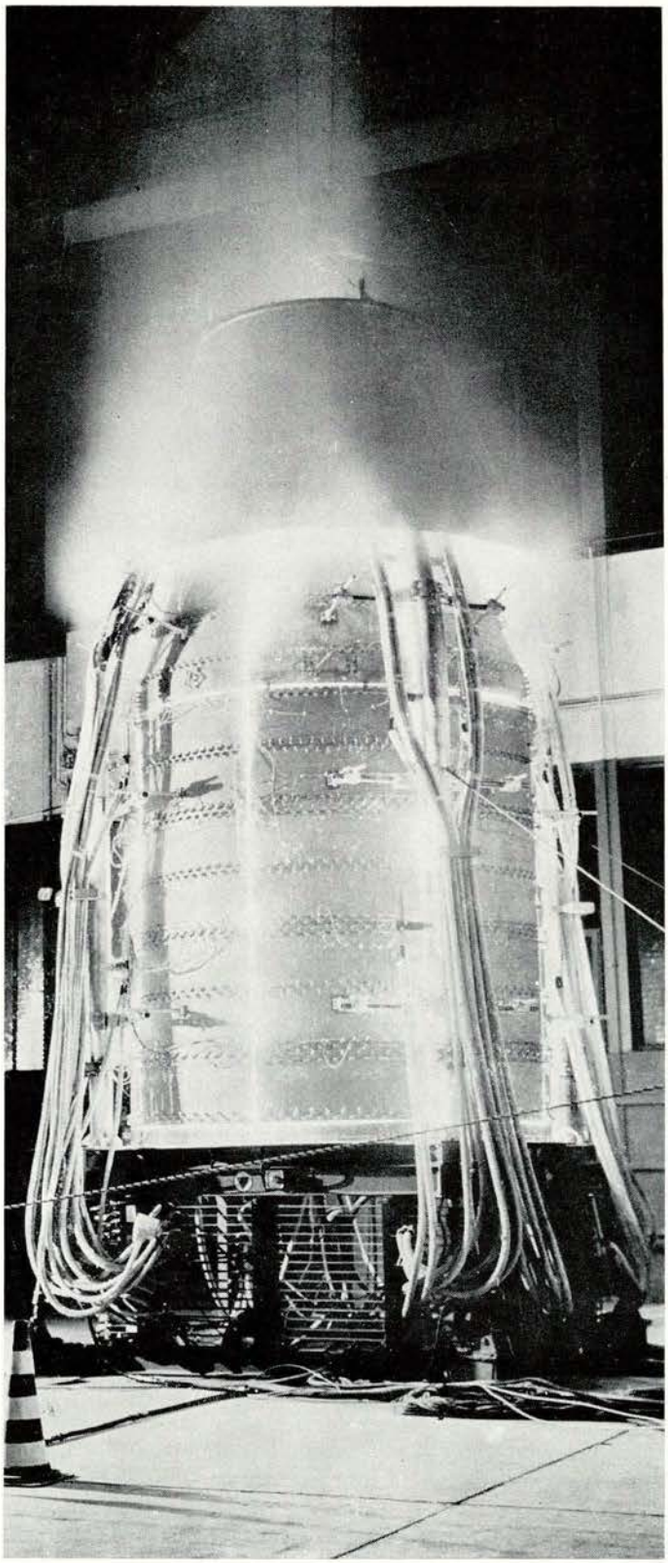
International Co-operation

Contributions to international scientific organisations play a greater role in the research effort of the Italian Government than in that of the other OECD countries, accounting for 20.52 per cent in 1967 compared with an average of 11 per cent in Germany, France and the United Kingdom. It represents more than the allocations to CNEN or even to the CNR which is responsible for promoting and co-ordinating Italian scientific research as a whole. It equals roughly 66 per cent of Ministry of Education expenditure.

Apart from the inadequacy of Italy's science budget, the experts consider that this " disequilibrium " is due to lack of coordination of the various bodies which have to decide on Italy's participation and to the absence of any precise definition of official policy based on criteria of scientific efficacy.

More than 90 per cent of the resources assigned to international research are devoted to nuclear and space research, through the European Atomic Energy Community (EURATOM) for nuclear research, the European Launcher Development Organisation (ELDO), the European Space Research Organisation (ESRO) for space, the European Organisation for Nuclear Research (CERN) and the International Atomic Energy Association (IAEA) for high energy physics. Up to 1967 nearly all space research was conducted through ELDO and ESRO, whereas nuclear research carried out through EURATOM, CERN and IAEA accounted for 58.4 per cent of the total public expenditure on this field of research in Italy in 1967.

In view of the relative size of these contributions, the Italian authorities would like to see the definition of specific



The satellite for the ELDO Europa I rocket has been developed by Italy. Contributions to international scientific organisations bulk larger in the Italian research effort than in that of other Member countries.

programmes of common interest or even the review of current programmes, particularly in nuclear research where the countries concerned have not yet succeeded in drawing up a European policy.

There is also bilateral co-operation between the United States and Italy. United States subsidies to Italian research are low, amounting to L 1.7 thousand million in 1967, but Italy is one of the European countries to benefit the most from United States loans, coming before Germany, and France, but after the United Kingdom. Most of the subsidies are allocated by the Defence Department, and the Atomic Energy Commission also makes a contribution. The major fields affected are as follows :

- co-operation in work in various fields of basic applied physics with activities concentrated on a number of electronic and solid state physics laboratories;
- collaboration in the work of the linear accelerator at the Frascati national laboratories;
- advanced training in biology, and regular contacts between the University of Berkeley and the Naples International Laboratory of Genetics and Biophysics;
- joint research in magnetic resonance and nuclear polarisation.

Projected Reforms

The organisation of research in Italy which is partly based on tradition is in the process of change. Plans for reform, which themselves have been changed frequently, have been put forward on several occasions. As in most countries the education system has been blamed since it cannot provide the research workers needed because of the progress of scientific knowledge and techniques.

" The difficulty in a reform of this kind ", said Professor Vincenzo Caglioti, Chairman of the National Research Council, " flows from a fairly natural tendency which is traditional with us to try to solve all problems at the same time and to look for the answer to an individual problem in the context of a whole series of very vast problems... With a view to university reform the Government introduced a first set of measures covering the whole of university teaching. It was therefore difficult to reach agreement among the different parties. "

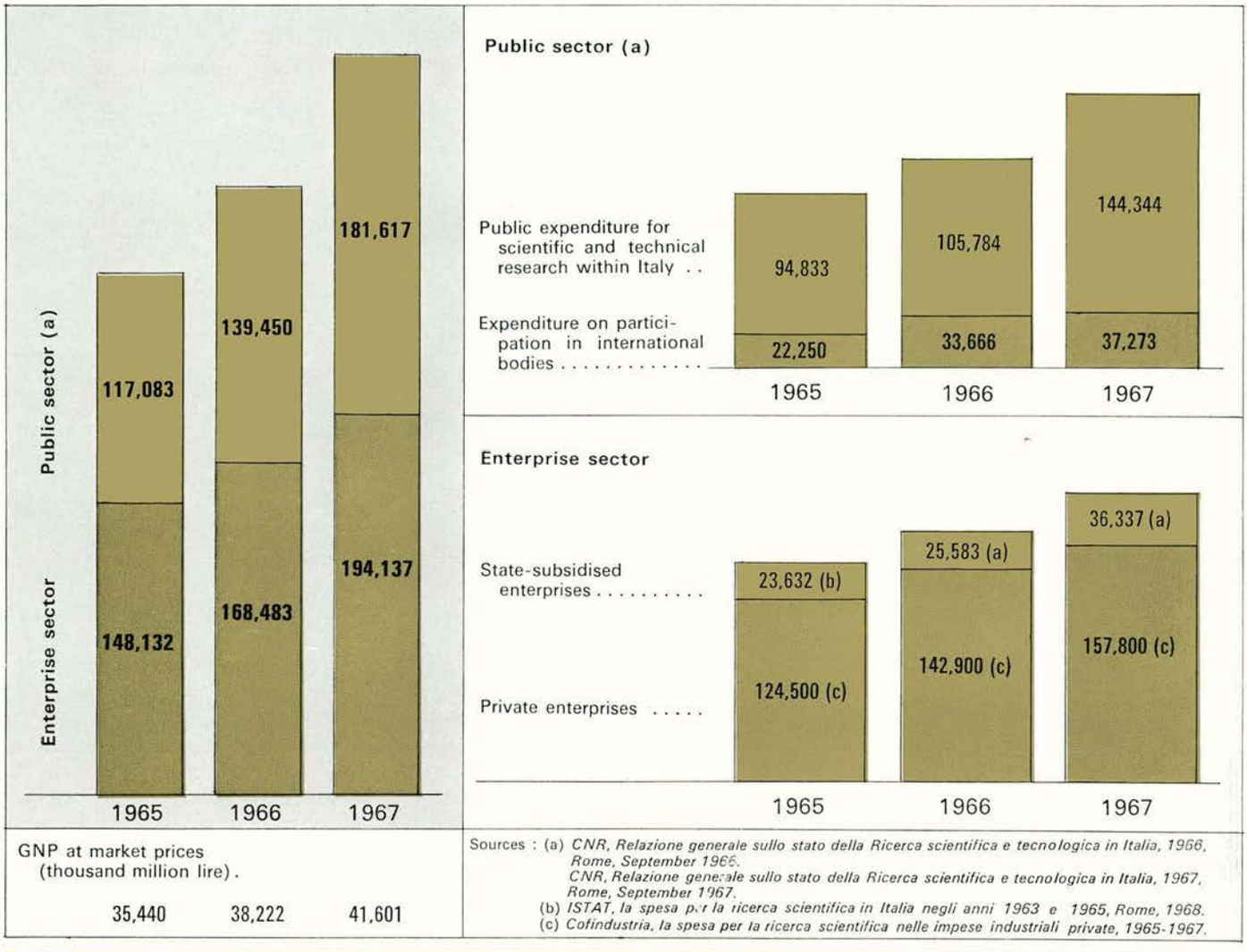
A Bill (No. 2314) on the reform of the university system contains provisions on scientific institutes and departments. The scientific institutes planned under this Bill would group together several identical or similar curricula so that there would be better co-ordination of research and teaching.

Since this overall reform project had not been agreed, the Government adopted a new and more practical approach, proposing a series of limited measures to solve immediate problems and to renew the university structures and make them more autonomous.

Each institute would be directed for two years by the holder of a Chair appointed by the Rector of the university on the proposal of the Board of Governors of the Institute (consisting of professors and a representative of the assistants). The necessary working rules for these institutes would be drafted by the university authorities themselves.

The creation of departments (an innovation called for by numerous members of the Italian university community) would co-ordinate the activities of several institutes or several Chairs (possibly belonging to several Faculties) which would undertake complementary research. The department would permit the pooling of costly scientific

1 - AGGREGATE RESEARCH EXPENDITURE 1965, 1966 AND 1967
CURRENT PRICES (million lire)



GNP at market prices (thousand million lire).

1965	1966	1967
35,440	38,222	41,601

Sources : (a) *CNR, Relazione generale sullo stato della Ricerca scientifica e tecnologica in Italia, 1966, Rome, September 1966.*
CNR, Relazione generale sullo stato della Ricerca scientifica e tecnologica in Italia, 1967, Rome, September 1967.
(b) *ISTAT, la spesa per la ricerca scientifica in Italia negli anni 1963 e 1965, Rome, 1968.*
(c) *Cofindustria, la spesa per la ricerca scientifica nelle impese industriali private, 1965-1967.*

equipment, central services and libraries and would co-ordinate the scientific work within its domain, administer the facilities and staff assigned to it and make research agreements. Each department would be directed by a Faculty professor nominated for two years by the Rector on the proposal of the Board of the Department. It would award the " research doctorate " diplomas which it is planned to introduce.

The experts believe that the adoption of this limited reform would greatly improve the status of research in the universities by bringing into general use the practice already followed in the most advanced sectors of academic research (especially in physics) and that it would also facilitate the harmonisation of curricula and the co-ordination of research, while cutting down duplication.

The National Research Centre is making an effort along these lines but the experts consider that the best results have come from the National Institute of Nuclear Physics. This Institute is divided into nine sections and brings together all the research workers in the same field. It is allocated credits by the CNR and the CNEN and effectively co-ordinates the research undertaken in the different Institutes of Physics.

After the OECD examiners' visit to Italy, the Italian Parliament approved a Bill setting up the University of Calabria. The structure of this University will be quite different from the traditional structures in Italian universities and will provide new degree courses (laurea) more suited to the present needs of the country. The success of this venture will depend on the extent of autonomy it will be given. An effort by the Government to make universities more autonomous might solve the problem of the research doctorate and incidentally the introduction of new educational levels.

The introduction of several degree levels (the number would vary according to the different Faculties) would meet the need to reform the rigid procedures for awarding diplomas which neither respond to the needs of the professions nor those of research.

It would also make it easier for young people to choose a career suited to their natural aptitudes. This is an advantage which is particularly important in a society where the opportunities offered to the individual are increasing at the same time as the risks of frustration and inadaptation.

CURRENT PROBLEMS

During 1968 and 1969 the performance of the Japanese economy has been remarkable. Not only has growth been stronger than in any preceeding period, but at the same time the balance of payments situation has improved. Thus relieved for the foreseeable future of the problems involved in protecting a low level of reserves, the Japanese authorities have a promising new framework for future actions. However, OECD's Economic and Development Review Committee points out in its recently published 1969 economic survey of Japan, the new situation will pose its own problems.

The business upswing which has been underway in Japan since 1966 has exceeded in duration and strength any of its post-war predecessors. Japan has become the world's third largest industrial nation after the United States and the USSR and ranks fifth in the list of world trading countries.

In the earlier period of the current upswing, the external account followed a well-known pattern : once the boom had been firmly established (in the middle of 1966) the balance of payments began to deteriorate steadily, prompting the authorities to resort to restrictive measures in the summer of 1967. After the usual delay of several months, economic activity started levelling off, with the balance of payments improving sharply. But in contrast to previous adjustment periods, the weakening of the boom proved short-lived. The economy resumed a vigorous upward trend in the second quarter of 1968, entering its fourth consecutive year of rapid expansion in late 1968. Last year's growth of real GNP outpaced the 13 per cent rate registered in 1967 and a further increase of 10 to 12 per cent is expected for 1969.

In spite of these sustained boom conditions, the basic external accounts (goods and services plus long-term capital) yielded record surpluses in the first six months of 1969, and official foreign exchange reserves rose sharply from a previous low of $1.9 billion in April 1968 to exceed the $3 billion mark. This resulted not only from a record current account surplus which, though it is expected to diminish over the year ahead, seems likely to remain substantial, but also from an improvement in the long-term capital account.

This spectacular strengthening of the external position under continued boom conditions has taken many Japanese and outside observers by surprise. It had been a regular feature of Japanese post-war history that every two to three years the economy had to be submitted to a cooling-off period after the expansion had run into balance of payments difficulties. It was generally felt that the balance of payments would remain in a rather delicate situation as long as the economy was growing between two and three times as fast as those of other industrialised countries. This impression had been supported by the persistently low level of external reserves.

OECD's survey examines to what extent the radical change in Japan's balance of payments may mark a lasting departure from the previous pattern of developments, a question which is considered to be of basic importance for the future course of policy and for Japan's international economic relations. Although the change is of relatively recent origin — it is only 1 1/2 years since Japan was in an apparently serious external payments situation — " the evidence seems rather strong that the improvement is largely of a more permanent character ", the survey concludes, adding that any assessment of balance of payments prospects requires great caution.

Is the Surplus a Temporary Phenomenon?

Special factors have played a role in producing the sharp swing during the last balance of payments cycle, but they seem to have been rather more important in boosting the deficit of 1967 than in inflating the surplus of 1968 and early 1969. In quantitative terms a sharp acceleration of exports has been the main reason for the recent considerable increase of the current surplus, but these had fallen, in 1967, well below their previous trend of growth, (largely because of weak world demand) and have only recently returned to it. OECD's Economic Development and Review Committee finds the reason for the spectacular improvement in the current balance largely on the import side : the fall of imports in 1968-69 was below trend lines, and there seems to be evidence that this decline is not a temporary phenomenon but the result of a structural change in production towards less material-intensive and hence less import-dependent branches of industry. The main " import saving " was concentrated on raw materials and semi-manufactures, which represent 70 per cent of total imports). If the structural shifts in the pattern of production are not reversed, it would appear that the level of these imports had been permanently reduced and that the marginal propensity to import in response to changes in the level of production may not recover to previous rates. The survey qualifies this judgment by noting the possibility that other imports — of high-income food, for example, or finished consumer goods other than food, which now amount to only 2.3 per cent of total imports — may accelerate.

Some decline of relative import dependence also became manifest in services. The deficit on invisibles which had trebled between 1961 and 1967 rose relatively little in 1968. This was only partly attri-

butable to the fall that has taken place in world freight rates. More important from a longer-term point of view has been the increase of the Japanese merchant fleet, which has helped to reverse the former rise of the traditional deficit on freight account.

Even if imports increase considerably (by 30 per cent) during the rest of this year and if exports were to show no further rise (the assumptions are extreme), the current account for 1969 would still show a surplus of over $2 billion. Moreover, whereas previous balance-of-payments cycles have been characterised by opposite trends in the current and long-term capital balance, this time the marked swings of the current account have been accompanied by almost parallel movements on long-term account. Despite the continuing considerable outflow of Japanese capital, the long-term capital account has shown a small surplus so far this year, mainly due to large purchases of Japanese securities by foreigners. It seems likely, therefore, that the basic surplus will be substantial this year.

New Opportunities and New Problems

The strengthening of the Japanese external position has a number of positive aspects. First of all, in the likely absence of " boom deficits " and with a more comfortable level of external reserves, a major constraint on demand management policies may have been removed for the foreseeable future with the result that there may no longer be a need to submit the economy every two or three years to a " recession " or cooling-off period in order to protect reserves. Second, the fulfilment of Japan's foreign-aid commitments should be eased and this could eventually lead to an improvement of aid programmes. Finally, the environment should be more favourable for removing remaining import restrictions and obstacles to capital export, and in fact such restrictions are being progressively removed.

On the other hand, the speed of the switch from a potential deficit to a large basic surplus and the orders of magnitude involved in this change have created new problems. With the attainment of a more adequate level of external reserves, Japan is, for the first time in her history, experiencing the problems of surplus countries trying to avoid undue strains on international liquidity.

A second problem for policy makers is that in the (likely) absence of important balance of payments constraints, the enforcement of quick policy adjustments may become more difficult and the reaction of business slower.

Finally, the problem of maintaining cost and price stability over time and of avoiding the building up of excess capacity may require greater attention than hitherto. In fact, the price problem has emerged as a principal policy issue since the balance-of-payments difficulties have been removed.

The behaviour of main price indicators during the last three business cycles suggests that factors other than excessive demand have played the more important role in the persistent upward movement of prices. Among such factors are government policies in respect of agriculture and public services. The price rise in private services can largely be explained by the tendency for wage increases in industry to spread to the service sector. Prices of manufactured goods have, on the whole, shown a high degree of stability in recent years, thanks to the rapid increase in productivity which has largely kept pace with the progress of wages. It would appear, therefore, that the price problem is, to a large extent, of a structural nature which can best be coped with by policies designed to raise the level of productivity in low productivity sectors and to stimulate labour mobility, thereby keeping the economy growing at an optimum rate.

In this connection, it is interesting to note that the progressive acceleration of growth of GNP from 10 per cent (in volume) in 1966 to 14.4 per cent in 1968 was associated with a decline of the GNP price deflator from 4.5 per cent to 3.7 per cent and that the rise of consumer prices in 1968 (5.5 per cent) was smaller than that registered during the " recession year " 1965 (6.6 per cent); by April 1969, the year-over-year advance was down to 4.7 per cent.

Outlook and Aims

The prospects are that Japan may remain an important surplus country for some time to come, though the size of the surplus may depend significantly on relative cyclical conditions at home and in the major foreign markets. The present level of official reserves is still relatively low, if compared with that of several Member countries. But the authorities are, apparently, not aiming at any particular reserve target and wish to keep the rate of increase of reserves within reasonable limits. In fact, the official medium-term balance-of-payments aims are for a current account surplus, offset for the most part by long-term capital exports (mainly to developing countries) and allowing for a rather gradual increase of reserves. The five-year programme, prepared in 1966, had set a target of $1.4 billion for the current surplus, to be attained by 1971. But all long-term projections for the Japanese economy are at present being re-examined by official bodies.

The Japanese authorities are already seeking progressively to fulfil their commitments to the adoption of more liberal policies concerning imports, current invisible transactions and capital exports. Since, if present trends continue, a large surplus on Japan's balance of payments may remain even though fast growth in the economy is maintained, further progress in liberalising current external transactions and capital exports is highly desirable from the international point of view.

From the point of view of international equilibrium, it seems desirable in present circumstances to sustain a high rate of growth of the economy and to continue efforts to discourage borrowing from abroad. A more liberal import policy would also help to dampen price pressures and speed up the shift of labour from low to high productivity sectors — a shift necessary to close the important gap in living standards which still exists between Japan and other advanced industrialised nations. The present strong domestic expansion should make it easier for the Japanese authorities to overcome the social problems that have to be taken into account when accelerating the movement towards the removal of the remaining restrictions on imports.

THE OUTLOOK FOR INTERNATIONAL TOURISM IN 1969

and the Record for 1968

Figures for the first half of 1969 indicate that foreign tourism will, for the year as a whole, show an improvement over 1968. Both the complete 1968 results and indications for 1969 appear in the recently published annual report of OECD's Tourism Committee (1) on which the following article is based.

(1) " Tourism in OECD Member Countries in 1968 and the Early Months of 1969 "

Data so far available on foreign tourism in OECD Member countries during the current year, which generally cover the first five or six months, point to a very favourable development in 1969 (see table 1). In the European Member countries, continued economic expansion in Germany brought about a substantial increase of tourism from Germany. An increase in travel to Europe by United States residents was also recorded, especially to Greece, Portugal, Spain, the United Kingdom and Switzerland. On the other hand, travel abroad by French and United Kingdom tourists was uneven depending on the countries visited. The restrictions on internal demand and the maintenance of a reduced tourist's foreign currency allowance in these two countries from which large numbers of tourists travel abroad, will, however, in the view of OECD's Tourism Committee, continue to have noticeable repercussions on the development of foreign tourism in Europe and on the direction of tourist flows from these countries.

In the United States and Japan, foreign tourism also developed satisfactorily during the first six months of 1969; the total number of visitors to the United States from overseas countries increased by 13 per cent and in Japan the number of foreign visitors rose by 22 per cent as compared with the corresponding period of 1968. In Canada the number of United States visitors' arrivals during the first five months increased by 4 per cent.

There is reason to hope that the very favourable trend in North Atlantic tourist exchanges, apparent for the early months of 1969, will continue during the whole of the year due on the one hand to the official announcement by the Government of the United States that it will not seek to limit tourist expenditure abroad by United States residents; at the same time, the renewed efforts of the United States Government to encourage foreign tourism, as well as publicity measures abroad and price reductions on air transport should also play a role in attracting more foreign visitors.

The upward trend of foreign tourism, noticeable in European Member countries in 1969, contrasts with the situation observed in 1967 and 1968. In 1967 the rapid and continuous expansion which had been a feature of international tourism since the end of the war was interrupted in most European Member countries and in 1968 the recovery was very slight except in Austria, Spain, the United Kingdom and Yugoslavia.

In 1967, the levelling off recorded in international tourism in most European Member countries was due mainly to the slowing down of economic activity in Member countries, notably in Germany, in the United Kingdom and in France — countries from which large numbers of tourists travel to other European countries — and also, to a certain extent, to restrictions imposed in the United Kingdom since July 1966 on tourist allowances in foreign currency.

In 1968, German tourism abroad was slow to resume its upward trend, despite the strong recovery of the domestic economy, and for the first time since the war the total number of nights spent in Europe by tourists from the United States showed a decrease. Tourism from the United Kingdom was affected by the maintenance of restrictions on travel allowances in foreign currency and by the devaluation of the pound. In fact, in the United Kingdom and also in Denmark, Finland, Iceland, Ireland and Spain, the devaluations of end 1967 had the effect of reducing the purchasing power abroad of tourists from these countries. The social unrest in France in May and June 1968 had unfavourable repercussions both on foreign tourism in France and on French tourism abroad, which was further checked by restrictions on tourist allowances in foreign currency imposed from the end of May to the beginning of September and from November 1968 onwards.

In statistical terms the development of foreign tourism in OECD countries in 1967 and 1968 is reflected in their receipts and expenditure on account of international tourism (see table 2). Total tourist receipts in foreign currency in OECD Member countries amounted to about 10.9 billion dollars in 1968 as against 10.8 billion dollars in 1967; total receipts of European Member countries amounted to 8.1 bil-

1. STATISTICS ON FOREIGN TOURISM IN MEMBER COUNTRIES DURING THE EARLY MONTHS OF 1969

(Rounded figures)

Country visited \ From		All countries		United States		Germany		France		United Kingdom	
		In thousands	%1968/69	In thousands	%1968/69	In thousands	%1968/69	In thousands	%1968/69	In thousands	%1968/69
ARRIVALS OF FOREIGN VISITORS AT FRONTIERS											
Greece	6 months	393	+ 27	110	+ 42	49.5	+ 54	33.8	+ 84	47.6	+ 47
Italy	5 months	6,084	+ 18	425	+ 20	1,396	+ 27	1,123	— 10	344	+ 15
Portugal	6 months	997	..	126	+ 30	42.7	+ 20	37.3	+ 11	135	+ 5
Scandinavia	5 months	3,107	— 6	101	+ 7	2,691	— 6	159	+ 14	99.5	+ 8
Spain	6 months	7,474	+ 13	394	+ 30	630	+ 31	2,539	+ 9	959	+ 15
Turkey	..	..	..	..	..	..	..	..	..	..	..
United Kingdom	6 months	1,531	+ 27	435	+ 26	162	+ 18	287	+ 63	..	..
Yugoslavia	6 months	8,954	+ 8	..	..	..	..	..	..	..	..
Canada	5 months	Overseas : 85.5	+ 1	9,723	+ 4	..	..	..	..	..	..
United States	6 months	Overseas : 716	+ 13	Europe : 312	+ 9	55.7	+ 8	34.4	+ 27	94.1	+ 2
Japan	6 months	237	+ 22	92.8	+ 42	6.6	+ 32	3.9	+ 11	12.5	+ 20
FOREIGN TOURIST NIGHTS IN HOTEL OR ALL MEANS OF ACCOMMODATION											
Austria (a)	6 months	17,204	+ 8	532	+ 10	12,550	+ 8	307	— 2	1,051	+ 5
Germany (a)	3 months	1,955	+ 9	314	+ 4	..	..	187	— 5	162	+ 2
Italy (a)	5 months	11,643	+ 12	1,480	+ 7	4,382	+ 22	844	— 9	723	+ 12
Netherlands (b)	3 months	557	+ 8	..	..	146	+ 3	..	..	..	..
Norway (b)	4 months	479	+ 7	31.6	+ 2	27.5	+ 1	3.9	— 11	52.2	— 11
Portugal (a)	4 months	802	+ 12	201	+ 25	89	+ 29	45.2	— 27	137	+ 21
Switzerland (b)	6 months	8,602	+ 4	788	+ 16	2,635	+ 5	1,282	— 13	933	— 2
Yugoslavia (a)	6 months	5,324	+ 27	103	+ 23	1,866	+ 37	117	+ 17	285	+ 10

Source : *Information supplied by Member countries and Yugoslavia in reply to an annual questionnaire of the Tourism Committee (Preliminary figures).*
Notes : *(a) Nights recorded in all registered tourist accomodation.*
(b) Nights registered in hotels.

2. RECEIPTS AND EXPENDITURE OF OECD MEMBER COUNTRIES ON ACCOUNT OF INTERNATIONAL TOURISM

(Rounded figures in million of US dollars)

	Receipts					Expenditure				
	1966	1967	1966-1967 % change	1968	1967-1968 % change	1966	1967	1966-1967 % change	1968	1967-1968 % change
Austria	595	615	+ 3	687	+ 12	171	219	+ 28	257	+ 17
BLEU	230	242	+ 5	274	+ 13	320	370	+ 16	398	+ 8
Denmark	201	222	+ 10	233	+ 5	187	228	+ 22	227	— 1
Finland	38	48	+ 26	64	+ 33	67	74	+ 10	66	— 11
France	1,000	1,035	+ 3	954	— 8	998	1,041	+ 4	1,099	+ 6
Germany	766	840	+ 10	911	+ 9	1,533	1,522	— 1	1,582	+ 4
Greece	143	127	— 11	120	— 6	41	41	—	43	+ 5
Iceland	3	3	+ 7	3	+ 7	10	11	+ 8	4	— 63
Ireland	182	190	+ 4	182	— 4	88	83	— 6	87	+ 5
Italy	1,460	1,424	— 3	1,476	+ 4	261	298	+ 14	363	+ 22
Netherlands	323	316	— 2	342	+ 8	344	395	+ 15	458	+ 16
Norway	95	102	+ 7	103	+ 1	78	90	+ 15	95	+ 5
Portugal	260	258	— 1	201	— 22	82	71	— 13	66	— 7
Spain	1,132	1,127	—	1,179	+ 5	67	78	+ 16	75	— 4
Sweden	99	109	+ 10	109	—	242	286	+ 18	308	+ 8
Switzerland	554	575	+ 4	592	+ 3	224	235	+ 5	249	+ 6
Turkey	17	19	+ 12	29	+ 57	30	27	— 10	34	+ 24
United Kingdom	613	652	+ 6	678	+ 4	832	761	— 8	649	— 15
TOTAL European Member Countries *(rounded to nearest billion dollars)*	**7.7**	**7.9**	**+ 2**	**8.1**	**+ 3**	**5.6**	**5.8**	**+ 4**	**6.1**	**+ 4**
Canada	780	1,212	+ 55	920	— 24	836	830	— 1	928	+ 12
Japan	79	89	+ 13	126	+ 42	118	146	+ 24	167	+ 14
United States	1,590	1,646	+ 4	1,770	+ 8	2,657	3,195	+ 20	3,022	— 5
TOTAL OECD Member Countries *(rounded to nearest billion dollars)*	**10.2**	**10.8**	**+ 7**	**10.9**	**+ 1**	**9.2**	**10**	**+ 9**	**10.2**	**+ 2**
Yugoslavia	117	150	+ 28	187	+ 25	34	51	+ 50	51	—

(1) Figures exclude receipts and expenditure on account of international tourist transport.
(2) Figures for Canada, Ireland, Switzerland, United Kingdom and United States are based on sample enquiries figures for the other countries are based on bank returns.
(3) Devaluation in 1967 in Denmark, Finland, Iceland, Ireland, Spain and the United Kingdom.

3. GNP EXPORTS AND TOURIST RECEIPTS IN FOREIGN CURRENCY

($ '000 million)

	1958	1967	% increase
TOTAL OECD :			
1. GNP	811.7	1,550.2	+ 91
2. Exports of Goods and Services	92.7	196.8	+ 112
3. Tourist receipts	4.039	10.835	+ 168
% 3/1	(0.5 %)	(0.7 %)	
EUROPEAN MEMBER COUNTRIES :			
1. GNP	291.4	573.9	+ 97
2. Exports of Goods and Services	59.5	125.2	+ 110
3. Tourist receipts	2.827	7.888	+ 179
% 3/1	(1.0 %)	(1.4 %)	
EEC MEMBER COUNTRIES :			
1. GNP	166.7	341.0	+ 105
2. Exports of Goods and Services	32.0	75.4	+ 136
3. Tourist receipts	1.527	3.841	+ 152
UNITED STATES :			
1. GNP	454.965	803.914	+ 77
2. Exports of Goods and Services	23.067	45.756	+ 98
3. Tourist receipts	0.825	1.646	+ 100

4. CONSUMER EXPENDITURE, DISPOSABLE INCOME AND TOURIST EXPENDITURE IN FOREIGN CURRENCY

($ '000 million)

	1958	1967	% increase
TOTAL OECD :			
1. Consumer expenditure	521.700	945.000	+ 81
2. Tourist expenditure	3.762	10.074	+ 166
% 2/1	(0.7 %)	(1.1 %)	
EUROPEAN MEMBER COUNTRIES :			
1. Consumer expenditure	189.700	355.400	+ 87
2. Tourist expenditure	1.724	5.814	+ 237
% 2/1	(0.9 %)	(1.6 %)	
EEC MEMBER COUNTRIES :			
1. Consumer expenditure	105.800	208.900	+ 97
2. Tourist expenditure	0.883	3.610	+ 309
UNITED STATES :			
1. Consumer expenditure	291.057	494.308	+ 70
2. Tourist expenditure	1.460	3.195	+ 119

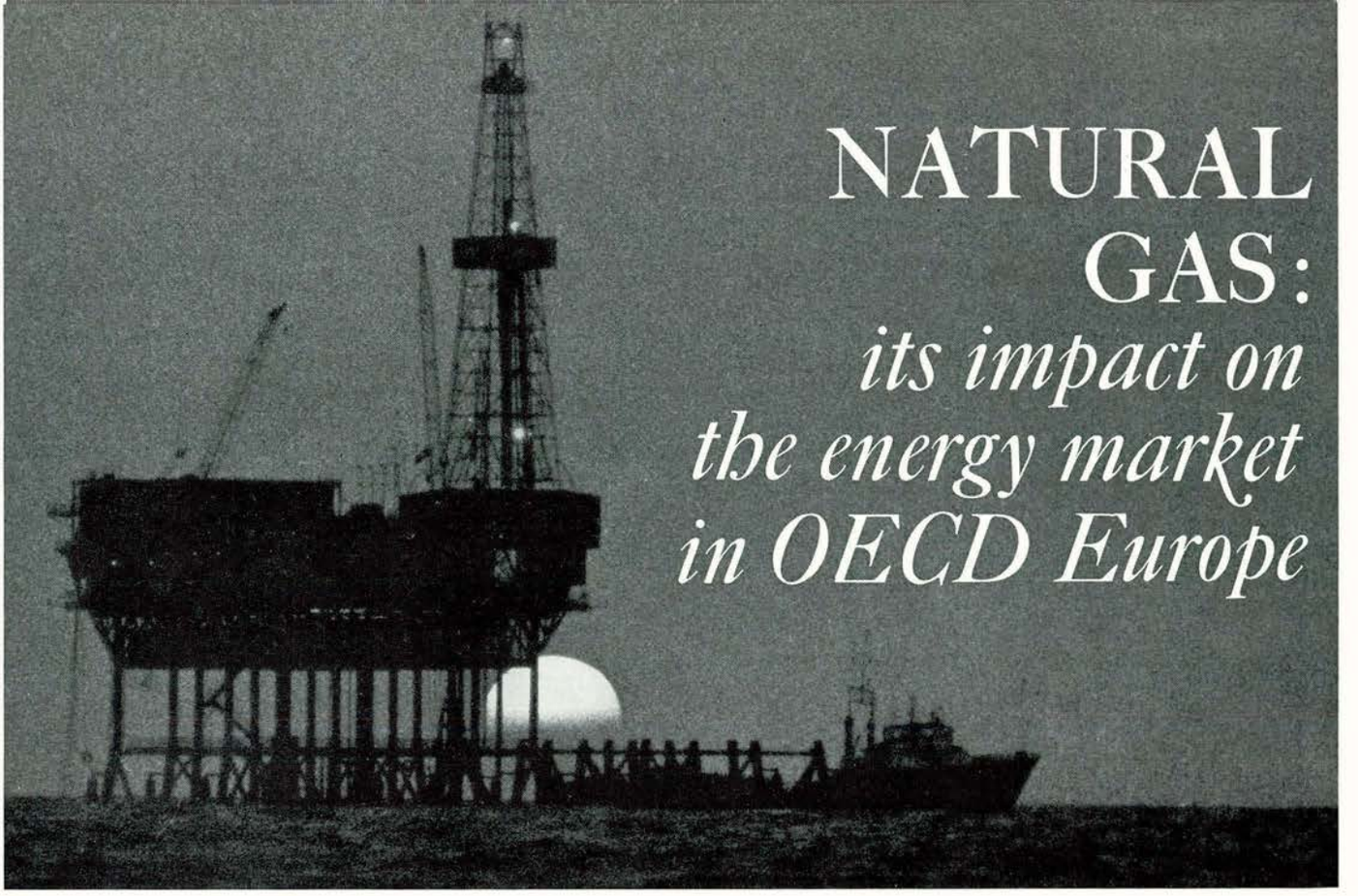
Country	% increase 1958-67		Relative increase in tourist expenditure	% tourist expenditure Disposable income	
	Disposable income	Tourist expenditure		1958	1967
Austria	+ 96	+ 544	5.7	1.0	3.1
Belgium	+ 81	+ 302	3.7	1.1	2.5
Denmark	+ 131	+ 317	2.4	1.5	2.7
France	+ 119	+ 567	4.8	0.3	1.4
Germany	+ 101	+ 223	2.2	1.2	1.9
Greece	+ 114 (a)	+ 168	1.5	0.6	0.7
Ireland	+ 84	+ 118	1.4	2.8	3.4
Italy	+ 128 (a)	+ 271	2.1	0.3	0.6
Netherlands	+ 125	+ 357	2.9	1.2	2.5
Norway	+ 106 (a)	+ 88	− 0.8	1.6	1.4
Sweden	+ 95	+ 253	2.7	1.0	1.9
Switzerland	+ 114	+ 135	1.2	1.9	2.1
United Kingdom	+ 71	+ 79	1.1	1.0	1.0
Canada	+ 83	+ 48	− 0.6	2.4	2.1
Japan	+ 242	+ 816	3.4	0.1	0.2
United States	+ 71	+ 119	1.7	0.5	0.6

(a) National income.

lion dollars as against 7.9 billion dollars in 1967. The number of arrivals of foreign tourists in OECD Member countries in 1968 was around 114 million as against 113 million in 1967; arrivals in European Member countries and Yugoslavia were 88 million as against 86.5 million in 1967. The above figures show increases ranging from 1 to 3 per cent in 1968 as against 3 to 7 per cent in 1967 and 9 to 12 per cent in 1966.

The pause in the growth of foreign tourism was strongly felt by certain European OECD countries for which international tourism has become an export industry having particular importance for their economies. In 1967 tourist receipts in foreign currency accounted for over 6 per cent of Gross National Product in Ireland, almost 6 per cent in Austria and Portugal, over 4 per cent in Spain and almost 4 per cent in Switzerland. Tourism is also an export industry which is expanding rapidly. Thus, for European Member countries as a whole, tourist receipts in foreign currency increased by 179 per cent between 1958 and 1967, while their exports of goods and services increased by only 110 per cent and Gross National Product at market prices by 97 per cent. Despite temporary fluctuations due to variations in the economic, social and political situation, tourist demand remains considerable. Taking all the European Member countries together, tourist expenditure abroad between 1958 and 1967 increased three times as fast as total consumer expenditure. Over the same period, tourist expenditure abroad increased three times more quickly than private disposable income in Italy, the Netherlands, Sweden and Japan, nearly four times more quickly in Belgium, five times more quickly in France and almost six times more quickly in Austria. (See tables 3 and 4).

In view of the foreseeable continuation in the expansion of tourism during the coming years, the Tourism Committee stresses the necessity for governments to reinforce and give a new orientation to their tourist policies — in the field of tourist accommodation, equipment and transport, frontier formalities, tourist welcome and protection — and, above all, to seek new, more effective ways of staggering holidays; the implementation of such policies could be facilitated by increased co-operation between OECD Member countries.



NATURAL GAS: *its impact on the energy market in OECD Europe*

A source of energy and also a raw material, natural gas is increasing its share of the energy market in the European area of the OECD and it is of growing importance for the economy of the countries concerned. Initially supplied only to local consumers, in the 1950's it came to be used on a regional and then a national scale and in the 1960's it has become an object of international trade.

Having regard to these developments, the OECD Energy Committee and Special Committee for Oil set up a joint ad hoc Group to study the impact of natural gas on the other forms of energy. This working party, composed of representatives of nine countries and of the Commission of the European Communities and assisted by representatives of the Economic Studies Committee for the Gas Industry (COMETEC-GAZ), has assessed the situation in a report to be published shortly. The salient points are discussed in the following article.*

*Belgium, France, Germany, Italy, Netherlands, Norway, Spain, the United Kingdom and the United States.

In Western Europe known reserves of natural gas amount to some 4,000 10^9 cubic metres (Table 1), which is about half the reserves of the United States (8,200 10^9 m^3) or of the Soviet Union (9,000 10^9 m^3). The intensive exploration activity currently under way (Denmark, Germany, the Netherlands, Norway and the United Kingdom are searching for gas in particular in the North Sea, France in the South-West and in the Bay of Biscay and the Gulf of Lions, and Italy in the south of the country and in the Adriatic) may well increase this estimate; sedimentary formations of the type likely to contain oil or gas account for almost 40 per cent of the area of continental Europe. Similarly, the development of proved reserves can lead to a higher figure; for example, when the Groningen field in the Netherlands was discovered in 1960 it was estimated at 60 10^9 m^3 but the latest official figures are between 1,450 and 1,900 10^9 m^3.

Internal and External Resources

The European gas fields vary as to size, location and composition of the gas. As regards their size, out of nearly 200 fields producing gas in 1967, 186 had an annual output of less than 100 million m^3. Groningen and Lacq together accounted for almost one half of the quantities produced. Of the European gas fields, Groningen has the highest output (7.5 10^9 m^3 in 1967), and it ranks amongst the largest in the world.

The quality of the gas, too, varies from field to field. In Germany, for instance, the chemical composition of the gas is not uniform throughout the country and its calorific value runs from 4,700 to 12,200 kcal/m^3. Small fields often have to be exploited simultaneously to ensure that the associated pipeline will be an economic proposition. With a large-scale installation

1. RECOVERABLE RESERVES OF NATURAL GAS IN THE EUROPEAN OECD AREA (1)

(10^9 m³)

	Proved	Probable	Proved and Probable
EEC	2 587	(499)	(3 086)
of which : Germany	202	72	274
France (2)	215	85	300
Italy	180	..	(180)
Netherlands	1 990	342	2 332
United Kingdom (3)	700	300	1 000
Other countries, principally Austria	20	(5)	(25)
European area as a whole	3 307	(804)	(4 111)

(1) Situation in early 1969 for the United Kingdom ; as at 1st January 1968 for Germany ; in early 1968 for France ; at 30th June 1968 for Italy ; at 15th July 1968 for the Netherlands ; at 1st January 1967 for remaining countries. No account is taken of differing calorific values ; these can vary considerably between gas fields.

(2) Only 70 to 75 per cent of recoverable reserves can be marketed.

(3) North Sea.

Source : *National Delegations to the OECD.*

controlled automatically by computer, fields can be worked in such a way as to meet both the consumers' and the producers' requirements, namely, a gas of constant quality, and optimum technical and economic operation.

The geographical location of the gas fields also has a bearing on their development. The Italian deposits in the Po Valley are adjacent to industrialised and thickly populated regions capable of absorbing the entire output or more, but the Lacq region in France offered no sizeable outlets and pipelines had to be laid to carry the gas over quite long distances. The Groningen reserves, however, are located near substantial outlets and yet they are large enough to supply distant markets as well.

In short, producers have two distinct objectives. They have to maintain an optimum rate of extraction, and at the same time to continue their exploration effort on a large enough scale to ensure that gas will be available in sufficient quantities in the long term. In recent years they have met with considerable success, since the ratio of reserves to output has increased rapidly.

According to Member countries' forecasts, output from gas fields in the area may well rise to at least 120 10^9 m³ a year by 1975. Under the contracts concluded so far the quantity of gas to be exported from the Netherlands to other European OECD countries already exceeds 22 10^9 m³.

In addition to production within the area there are external sources of supply. In several regions adjoining Western Europe there are gas deposits which are not yet fully exploited. Methane carriers discharged their first cargoes of liquefied natural gas from Arzew (Algeria) on Canvey Island (United Kingdom) in 1964 and at Le Havre (France) in 1965. Spain and Italy have signed contracts for the importation of liquefied natural gas from Libya. In 1967 negotiations were opened between the USSR and Italy, which may take up to 6 10^9 m³ of Russian gas a year. Germany, too, is considering the possibility of such imports and France (1) may well do so, while Austria is already receiving gas from the USSR. In other words, an international market for natural gas is developing rapidly.

Prospects by Sectors of Consumption

Natural gas can be used in place of all the other sources of energy as a fuel and it can also replace some of them as a raw material; it is therefore able to penetrate all sectors of consumption. It has certain specific advantages, including regularity of supply, constant quality, convenience in use, absence of storage facilities, cleanliness, and reduction of air pollution. It thus has an edge over competing energy sources. Hence, although cost per calorie is still the main factor in assessing its competitiveness, natural gas may in certain cases cost more than coal or oil and yet be a serious challenge to these fuels.

The experts consider that the development of natural gas will affect the energy market in two ways, either successively or simultaneously. First, it will bring about a decline in the production of manufactured gas from coal or petroleum products, and will reduce the outlets for coke-oven gas. Secondly, it will lead to competition with other forms of energy, that will vary according to the sector of consumption to which it is offered and according to the forms of energy with which it is in competition.

The domestic sector is likely to witness rapid growth, particularly in space heating, because natural gas is convenient to use, is clean and requires no storage facilities. In this sector the consumption of coal, which is already under severe pressure from oil, could fall off rapidly, particularly in regions close to the gas fields. The arrival of natural gas will, however, only accelerate the present trend in view of the growing use of petroleum products. Oil, having to share this expansion with natural gas will find its growth reduced or even brought to a temporary standstill in some regions.

In the *industrial sector*, too, natural gas is likely to experience fast growth. It is used as a raw material (as a feed-stock in petrochemicals) and in applications where it offers advantages in the way of convenience in use and an easily-adjustable flame (glass industry, ceramics, etc.) but it can also be used as a source of heat; in these applications, coal has already been

(1) These proposals to export Russian gas are related to the agreements concluded by the USSR for the importation of Iranian gas : it is more economic for the USSR to import gas from Iran to supply its southern regions than to draw upon the Central Asian gas which is located farther away ; the latter can then be supplied to the central and western regions of the USSR and exported to other European countries.

largely replaced by oil products and in this sector as well the growth prospects of the latter will be affected by the presence of natural gas.

For the domestic and industrial sectors taken together, the experts consider that at least half of the increase expected between now and 1975 in the demand for substitutable energy will be covered by natural gas, and that if the most optimistic hypotheses as to availabilities prove correct the entire increase may be met by gas.

However, in the majority of countries the experts do not foresee many repercussions in the *power station* sector. Except close to big gas fields where natural gas could provide a large part of the base load, it is only likely to be used in power stations under interruptible contracts to ensure the initial filling of pipelines or in response to clean air measures.

The growth of energy requirements (excluding electricity) between 1966 and 1975 in the domestic industrial and power station sectors taken together could amount to some 200 million tons oil equivalent (Mtoe) whereas natural gas availabilities will increase by about 100 Mtoe, based on Member countries' forecasts, and by 110 to 140 Mtoe based on the experts' overall hypotheses.

Competition with other Forms of Energy

The introduction and competitive impact of natural gas in the energy economy will affect first of all the *gas industry*. It is expected that most of the distribution systems supplying manufactured gas will turn over to natural gas within a few years. Of the different kinds of manufactured gas, coke-oven gas will be the most affected. To obtain the best return, this gas will therefore have to be supplied to a few major industrial consumers (iron and steel, chemicals) in suitable geographical locations. The price will then have to be aligned on that charged for bulk supplies of natural gas to industry.

Other sectors of the gas industry will likewise be affected in varying degress — refinery gas, and petroleum products used as raw materials for manufacturing gas for public distribution. However, the contraction of this outlet should not present a financial problem for the oil industry anywhere near so great as those facing the coking plants. As for liquefied petroleum gas and light oils used for making or enriching town gas, they should easily be able to find fresh outlets in the chemical industry to make up for markets lost with the gas industry.

Technically speaking, natural gas is capable of replacing other forms of energy to an upper limit of some 70 per cent of total primary energy requirements. It does not compete with motor fuels or electricity for motive power and lighting, or with metallurgical coke used in blast furnaces. Even in these latter uses, however, it may well undermine the position of the traditional energy sources.

By and large, at current price levels in Europe, *indigenous coal* has not been able to compete effectively with natural gas any more than it could withstand the pressure of competition from oil products, except where it has enjoyed special protection either for thermal purposes (power stations) or in specific markets (iron and steel). Despite the inertia associated to some extent with the need to install new equipment, convert appliances and so on, the experts consider that the growing availability of natural gas is likely to accentuate the rundown of coal in Europe, and that the impact will be greater in the final consumption sector than in electricity generation.

The increasing use of natural gas has reduced the growth rate of *oil*. Here it is not so much a case of direct substitution, in that natural gas has claimed its share both as a substitute for coal and in the overall growth of energy requirements. Natural gas is even more convenient in use than oil but the difference is less marked than with coal. Overall, natural gas is mainly a competitor for the lighter fractions (gas/diesel oil, light fuel oil) in markets where its specific advantages count most but price considerations generally weigh in favour of oil products. Competition between natural gas and oil is influenced by the policies adopted in the various European countries with regard to prices and by the fiscal burden on liquid fuels.

The main area of competition between natural gas and *electricity* is cooking and water heating. In the case of heating and other non-specific uses in industry, the competition is wider-based since oil and, to a lesser extent, coal are also involved.

In Europe, with the partial exception of France, Italy and Austria, competition until recently was between gas manufactured from coal and oil and electricity generated for the most part from the same sources. Being out-priced by oil, gas and electricity have relied on their specific qualities to give them the edge in certain markets. The advantage of electricity is that it has a wider sphere of application than gas; it is essential for lighting and for many other uses in the home, while it has a captive market in industry and it has definite advantages for railway transport.

Future Availabilities — Two Hypotheses

In order to assess the impact that natural gas will have on others forms of energy in the future, it is necessary to estimate the amount which could be made available. Based on national forecasts, the quantities of natural gas which could become available on markets in the area around 1975 can be assessed at a total of 115 to 120 Mtoe a year (135 to 140 10^9 m^3).

Alongside the medium-term forecasts made by the countries in question, the experts put forward overall hypotheses as to production and, by comparison with forecasts of energy requirements, these are used to assess the probable impact of natural gas on other energy sources. Producers fix the rate at which their reserves are to be released on the basis of several factors, including :

- economic and technical conditions of production, transport and distribution;
- the state of the overall energy market within the countries concerned;

The natural gas field of Groningen, the Netherlands, has estimated reserves of 1,500 billion cubic meters, among the world's largest. This size will permit Groningen to supply distant markets as well as local ones.

- the relative prices of other forms of energy;
- the prospects for renewing gas fields as they become exhausted, and of making new discoveries;
- the prospects of recourse to imports from third countries; and
- government policies.

Depending on the relative weights of these various factors, two main hypotheses may be advanced as to the rate at which reserves will be released. Table 2 shows the limits within which these hypotheses would lie.

The first hypothesis (A) that reserves will be exhausted in 30 years corresponds to the lower limits for indigenous production. In practice, the trend of production from each field will probably depart from the model and the output rate will be reached only gradually; this method will, however, give a reasonable overall estimate of the production level that will be reached in the long term. Under these conditions, production may rise to 135 10^9 m^3 or some 115 Mtoe a year. In view of the time required for production at the gas fields to get into its stride and the need to establish a transport system, this level could in practice be achieved around 1975.

The second hypothesis (B) is exhaustion of existing reserves in 25 years; this would be feasible if significant additional discoveries allowed a higher production rate. The estimated level of output in this case is 161 10^9 m^3, or roughly 135 Mtoe a year.

If 12 to 24 Mtoe of gas is imported from non-member countries in addition to this indigenous production, the total annual availabilities of gas on the markets of the area from 1975 onwards may be expected to be between a minimum of 130 to 140 Mtoe (A) and a maximum of 150 to 160 Mtoe (B).

Based on Member countries' forecasts and these two overall hypotheses, natural gas could cover between 10 and 14 per cent of total primary energy requirements (1) in 1975. The situation is expected to differ from one country to another; growth will be particularly marked in regions close to the large gas fields of the Netherlands, the United Kingdom and Northern Germany. Generally speaking, the EEC countries and the United Kingdom stand to benefit greatly from the advent of natural gas, while in the other countries the degree of penetration (2.5 per cent) could prove to be well below the rates deduced from the various overall hypotheses discussed above.

If natural gas is to retain in 1980 the relative market share reached in 1975, new resources will have to become available, in the form of either indigenous production or imports. The annual quantity of gas needed for this purpose can be estimated at about

(1) In 1967, natural gas accounted for 3.2 per cent of overall energy consumption which amounted to 830.2 Mtoe.

2. ESTIMATES OF AVAILABILITIES OF NATURAL GAS IN OECD EUROPE IN 1975

	10^9 m³				Mtoe (2)			
	EEC	UK	Others	Europe OECD (1)	EEC	UK	Others	Europe OECD (1)
RESERVES								
— Proven	2 587	700	20	3 310	..	..	..	2 810
— Proven + probable (1)	3 000	1 000	25	4 000	..	..	..	3 400
PRODUCTION IN THE AREA								
— Member countries' forecasts (P)	79/87	40	1	120/128	67/74	34	1	102/109
— Possible production								
• Hypothesis that proven reserves will be exhausted in 30 years (A)	100	33	1	134	85	28	1	114
• Hypothesis that further discoveries might lead to exhaustion within 25 years (B)	120	40	1	161	102	34	1	137
IMPORTS FROM THIRD COUNTRIES								
— At present envisaged (C) (3)	8	1	5	14	7	1	4	12
— Twice what is at present envisaged (D) (4)	..	..	..	28	..	..	..	24
TOTAL AVAILABILITIES								
— Forecast (P + C)	87/95	41	6	134/142	74/81	35	5	115/120
— Possible								
• Hypothesis A (A + C/D) (5)	(108)	(34)	(6)	150/165	(92)	(29)	(5)	130/140
• Hypothesis B (B + C/D) (5)	(128)	(41)	(6)	175/190	(109)	(35)	(5)	150/160

	Mtoe				%			
	EEC	UK	Others	Europe OECD (1)	EEC	UK	Others	Europe OECD (1)
OVERALL ENERGY REQUIREMENTS (Forecasts)	675	249	201	1 125	100	100	100	100
COVERED BY NATURAL GAS								
Country forecasts (P)	74/81	35	5	115/120	11.0/12.0	14.1	2.5	10.2/10.7
Hypothesis A	(92)	(29)	(5)	130/140	(13.6)	(11.6)	(2.5)	11.5/12.4
Hypothesis B	(109)	(35)	(5)	150/160	(16.1)	(14.1)	(2.5)	13.3/14.2

(1) Rounded totals.
(2) A single conversion factor of 8,500 kcal/m³ has been used as a basis for calculation, in view of the widely differing compositions of the gas making up European reserves.
(3) Partially estimated.
(4) This upper limit is considered for the whole area only.
(5) Figures in brackets only include currently planned imports from third countries (C), in addition to the area's output; figures for the whole area cover this amount and the hypothesis of twice the imports currently envisaged.

25 to 35 Mtoe (30 to 40 10^9 m³); this implies the discovery of new reserves of the order of 700 to 1,200 10^9 m³, which the experts consider to be possible.

The impact of natural gas on the international energy scene is threefold. First, this relatively new form of energy is a factor in technological progress; the methods employed to carry natural gas over long distances are already well developed, and submarine pipelines are technically feasible. Furthermore, the fact that it is necessary to draw upon gas fields located far away from the centres of consumption has provided the stimulus for the immense progress made in gas liquefaction and the design of methane carriers.

Secondly, although it is difficult to foresee what effect the arrival of natural gas on the European energy market will have on prices, since the *initial* capital outlay is very high, it will bring more competition and this will have a favourable influence on consumer price levels. In addition, natural gas offers advantages for consumers and the community as a whole, not only from the technical standpoint, but also in the way of convenience in use and security of supply — benefits which cannot be quantified at this stage.

It also can make a substantial contribution to closer international relations. The natural gas market will inevitably assume an increasingly international character as the years go by. To take the best possible advantage of this heritage, undreamt of less than ten years ago, Member countries will have to orient their efforts towards measures which will promote economic growth and take the interest of other countries into account.

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