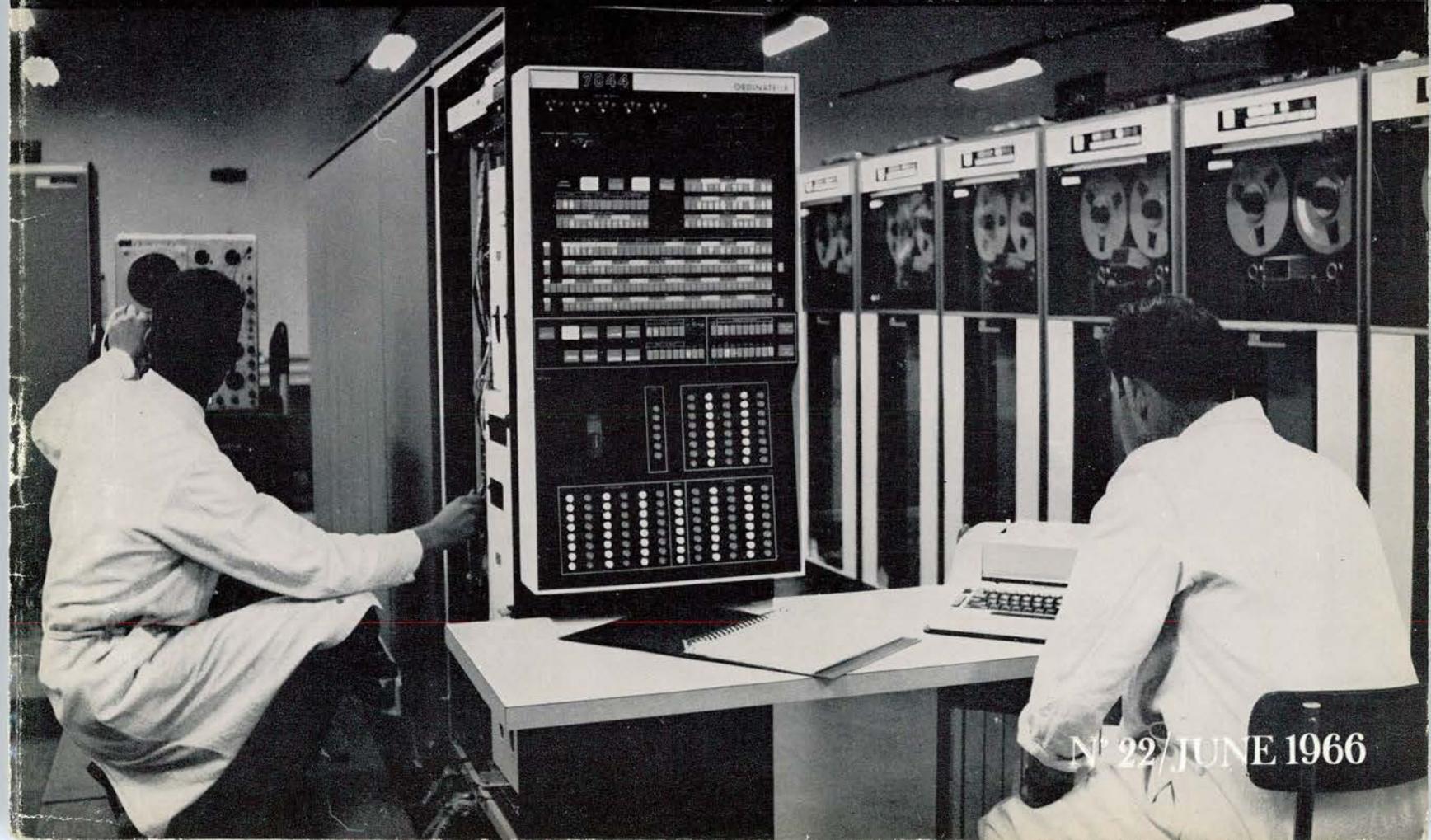


the **OEECD** **OBSERVER**

THE THREE GREAT ECONOMIC PROBLEMS
FACING THE WESTERN WORLD. FOREIGN
SKILLS AND TECHNICAL ASSISTANCE. THE
BASIS FOR ECONOMIC DECISION - MAKING:
STATISTICS. THE WORLD FOOD PROBLEM.
ADJUSTMENT TO TECHNOLOGICAL CHANGE.



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THE THREE GREAT PROBLEMS FACING THE WESTERN WORLD: *money, trade and food*

In presenting the 1966 report on the work of OECD to the Consultative Assembly of the Council of Europe, Mr. Thorkil Kristensen, Secretary-General of OECD, made the following statement:

There are three great economic problems which the western world will have to face in the years immediately ahead of us. They can be indicated by three simple words : *money, trade and food*, but the problems themselves are neither simple nor easy to solve. In fact they are all world problems, but in all of them western countries are bound to play a leading role because they represent such a large part of world production and trade. Therefore, these three problems will be at the centre of the work of the OECD in the near future. Directly or indirectly, most of the work of the Organisation is linked with these three problems or is put into a new perspective by their existence as it will appear from a careful reading of the OECD Report to the Council of Europe.



Turning first to the monetary question, this, no doubt, is a complex one and it is closely connected with conjunctural policies in general. In modern market economies the flow of monetary demand determines the level and direction of economic activity in each individual country as well as international trade and other international transactions. Therefore demand management is the most decisive element in current economic policies. Compared with the inter-war period, when lack of demand caused large-scale unemployment, western countries have after the war been remarkably successful in maintaining substantial economic growth with few and small interruptions.

(continued on page 4)

by
Thorkil KRISTENSEN
*Secretary-General
of the OECD*

THE THREE GREAT PROBLEMS FACING THE WESTERN WORLD: *money, trade and food*

However, new problems have come up. In a number of European countries there have been inflationary tendencies in recent years, mainly due to excess demand. In fact, governments and parliaments have not been firm enough in resisting the pressure for higher public expenditure without sufficient increase of taxation at the same time.

We cannot emphasise too often the experience of the last few years, that under conditions of absolutely full employment and even shortage of labour, effective incomes and price policies are not possible. An active manpower policy and the structural reform of agriculture can help because they encourage a transfer of productive resources to those sectors of the economy where they are needed the most, but price stability cannot be achieved without some restraint in demand management, especially in Europe where the labour force is growing slowly and the working week is becoming shorter.

In the absence of sufficiently firm fiscal policies some central banks have had to restrict credit and try to curb inflation through high rates of interest. This, however, is unfortunate, not only because such policies are harmful to productive investment, but also because the very high rates of interest in some European countries have had a disturbing influence on the international monetary system. That brings me to the monetary question in the narrower sense of the word.

It is unavoidable that *international payments* are subject to fluctuations and monetary reserves as well as credit facilities are there to finance such deficits and surpluses as may occur. Very large and persistent deficits are unfortunate and not reasonable because they force other countries to finance part of the activity of the deficit country.

It is therefore a task of major international importance further to reduce the deficits on the balance of payments of the *United States* and the *United Kingdom*, the two main reserve centres of the world. The Governments of the two countries in question have taken a number of measures to improve the situation but the events of the last few months seem to indicate that more needs to be done.

It is well known that a new Budget was presented yesterday in London to the Parliament of the United Kingdom. It contains some interesting proposals for new measures. It is too early to judge the effect of those measures, but I noted that the Chancellor said in his speech that more would need to be done later about the balance of payments.

I would like to stress, however, the important point that disequilibria in international payments are a joint responsibility of surplus and deficit countries. There can be no deficits without surpluses elsewhere, and the surplus countries and the deficit countries together have a responsibility for maintaining a squarely balanced situation in money affairs. The policies of a number of European countries have been unfortunate in that respect. The high interest rates in some continental European countries to which I have already referred have attracted capital from the United States in large quantities, and thereby they have contributed to the United States deficit. Interest rates in Europe have been up to 3 per cent higher than in the United States in recent months.

What I have said so far should underline how important it is that modern industrial countries plan their current fiscal and monetary policies after consultation with one another. Such consultation is in fact one of the major activities of the OECD but we have now reached a stage where monetary discussions and consultations have to go beyond the problems of current policy.

Roughly speaking monetary reserves of the various countries today consist of gold and foreign currency, mainly dollars, but for a few countries also pounds sterling. It is clear that the deficits of the United States and the United Kingdom have increased holdings of dollars and pounds sterling of some other countries and thereby added to their reserves. If these two

deficits disappear an important source of reserve creation will cease to flow. Concerning gold, stocks of gold increase only slowly and on the 1st August, 1964, Ministers and Governors of ten leading western countries — the so-called Group of Ten — reaffirmed publicly their conviction that a structure based on the established price of gold “has proved its value as a foundation on which to build for the future”. I agree with this statement about maintaining the present gold price but, if neither the gold component nor the currency component of our monetary reserves increases much in the years to come, the question arises: “Will there be a shortage of reserves?”

There is no danger for the immediate future, but decisions should be prepared before they become urgent and this is why the ten countries I have referred to are now discussing with the International Monetary Fund and the OECD fundamental questions regarding the international monetary system. For the first time in history the question is raised officially of taking international decisions concerning the total amount of monetary reserves. Up until now the growth of reserves has depended on gold production, the United States deficit and other factors not subject to international control.

The IMF can extend the drawing rights of its Member countries, and proposals to that effect have been made but the difficulty is that countries which draw on the Fund always ask for the currencies of a few major financial powers, most of them belonging to the “Group of Ten”. What the Fund can do is therefore limited by its holdings of those few currencies. Those ten countries have an arrangement with the IMF allowing the Fund on certain conditions to borrow from the Ten if one of them wants to draw on the Fund and this has been done on two occasions. Thereby they are strengthening the Fund and indirectly this helps other countries who want to draw, e.g. less-developed countries with balance of payments difficulties — because it relieves other resources of the Fund. However in our further considerations on monetary reform we must bear in mind not only the needs of those countries which are responsible for the greater part of international transactions — that is, the Western countries — but also those of other nations — in particular, the less-developed countries.

In any case the major western countries are called upon to take the lead if new ground has to be broken by international decisions on reserve creation, because it is mainly their currencies that are demanded. It is no accident that the Group of Ten (plus Switzerland, associated with it) has *exactly* the same membership as Working Party No. 3 of the OECD where these countries keep the monetary situation under constant review and watch one another's prospects and policies.

The crux of the matter is that any decision on reserve creation raises the thorny question of *monetary discipline*. If more reserves are created to serve the needs of increasing world trade and other transactions, how can we be sure that, say, European inflation is not reinforced because countries can afford to be more daring in their policies?

The only answer is that this requires multilateral discussion and surveillance, organised by the countries concerned, and this is exactly the purpose of OECD's work on economic policy in various organs and especially in Working Party No. 3. A further strengthening of this work is therefore likely to be part of the monetary reform when the time for it has come.

One could ask, however, whether there could not be an automatic discipline that would solve the problem without so much effort and discussion. The question is a tempting one to raise but the answer is “No!”. Whether the monetary system is based on gold alone or also on currency holdings and — maybe — some new international reserve units, two facts remain which give the individual countries a wide freedom of action that can be abused if there is no international control.

One is *international credit* that permits a country to run a large and persistent current deficit, financed by public or private borrowing abroad, perhaps facilitated by an excessively high rate of interest. Another is the power of *surplus countries* to neutralise the unpleasant effects of their surplus by internal financial measures and thus go on to run a surplus, harmful to international equilibrium.

Whether we like it or not, there is no automatic discipline whether the monetary system is based on gold alone or also on currency holdings. This means that there is no escape from multilateral surveillance, especially among the western industrial countries so dominant in international transactions. The OECD and its Member countries will need hard work and careful thinking if we are to steer our monetary economies between the two extremes of stagnation on the one hand and of overheated expansion on the other.



I come to the second problem, namely, trade. Here, we all look to the GATT where great efforts are now needed to make the Kennedy Round succeed in time. However, since the UNCTAD Conference in 1964 the special export problems of less-developed countries are discussed with fervour and here again the western countries must take the lead because their markets are so decisive. Therefore,

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the OECD is the proper forum for preparation of the action to come and we have established a Special Group, composed of representatives of the major trading countries, to draw up a report for discussion in the Organisation.

The most difficult question here is whether or not there should be *preferential* treatment for exports of less-developed countries. This is a question of principle but very concrete vested interests are also involved since some of these countries now have preferences, either for the EEC or in the Commonwealth, while other less-developed countries have no preference. Those who have them will ask for compensation if they are to be abandoned or absorbed in some more general preference system.

As a principle, it seems to be generally agreed that it is desirable to move towards a multilateral, non-discriminatory trade system with tariffs that become lower and lower, thus steadily increasing the freedom of trade. This means in practice that if preferences are given or maintained for a certain period the less-developed countries in question will already now have the benefit of certain tariff reductions that could later on become effective also for exporters from more developed countries.

The Special Group I have mentioned has started its work in a good spirit of co-operation but it is too early to judge what the outcome will be. One thing seems

clear, however. Industrial exports of less-developed countries are expanding much faster than was expected a few years ago and new tariff reductions, with or without preferences, would give them a new push. This should certainly be welcomed but it also means that western industry must adjust itself to markets where new competitors rightly claim to have increasing access. We will have in this respect to bring the OECD's work on trade, on industry and on development assistance, into a close but complicated inter-relationship.



Now concerning the problem of food, this has been accentuated by the present difficulties in India but it is of a much more general nature. During the last five or six years food production in less-developed countries has grown slightly less than total population and increasing food imports have therefore become necessary. From about 1950 to 1964 net grain imports of all less-developed countries taken together increased from 4 million tons to 25 million tons a year and recent studies indicate that ten to fifteen years from now these imports will represent an amount substantially larger than the total annual flow of development aid today. This is very serious and it has two important consequences.

First, if the less-developed countries were to finance these imports it would seriously jeopardize their economic development which requires increasing imports of machinery and other investment goods. There is therefore a need for more *food aid*, i.e. food exports to less-developed countries, financed by the industrial countries, and at the same time a need for more technical and financial assistance to further the development of agriculture in the less-developed countries themselves. Up until now food aid has been given on a large scale only by the United States and to some extent by Canada. The time has come for Europe to carry a larger share of the burden. These problems will be discussed by the OECD at a high level meeting of the Development Assistance Committee in July and by the meeting of the Ministers of Agriculture in October this year.

The other consequence of the development concerning food, of course, is that the total demand for agricultural products of OECD countries will increase. Already the surplus stocks of wheat in the United States and Canada have disappeared and if western countries are willing to finance exports of food to the poor nations to the extent indicated by the needs, this may make it somewhat easier to solve the present

surplus problem of western agriculture. Indirectly this should also facilitate the Kennedy Round where one of the greatest difficulties has been exactly the trade in agricultural products. This has been due exactly to the surplus situation that creates a conflict between exporting and importing countries.

It will, however, have to be decided how the financing of additional food aid is to be shared by the countries having a food surplus and other OECD countries. This is to say that we have before us a complex of considerations regarding trade, agricultural policies and development aid. It will not be an easy task to arrive at constructive and consistent policies in these fields where there are so many vested interests, but we have at least learned that the delicate problems of western agriculture should not be seen in isolation. We are in the process in *OECD* of reviewing agricultural policies of our Member countries. The world food problem will add to the importance of this review (1).



Let me finish with a few remarks on the implications for *Europe* of what I have been saying.

In the strictly economic and financial field the *United Kingdom* is in a special position. It must further improve its balance of payments and even aim at a surplus in order to repay the large sums borrowed in support of the pound sterling. Furthermore, it should abolish the surcharge on imports, and I am glad to see that the *United Kingdom* Chancellor of the Exchequer announced yesterday that this is to be done in half a year's time. However, if the *United Kingdom* is to join the Common Market in the near future, it will be exposed to the pressure of increased competition and, perhaps, to higher import prices for food.

It is therefore imperative to strengthen the competitive power of British industry. Progress has been made but much is left to be done, and this means increased investment. Now, it is necessary to keep down demand in order to improve the balance of payments. However, if this goes on for many years, economic growth will be very slow and such a climate is not conducive to innovation through new investment. I wonder, therefore, whether the *United Kingdom* ought not to have some long-term finance from abroad in order to stretch the debt repayments over a longer period and thereby relieve resources for constructive investment.

For *continental Europe* the problems are different. Here, the problem of inflation remains difficult, and there is shortage of labour. Therefore, fiscal policies

have to be quite firm in a number of countries in order to avoid restricting demand through the high interest rates that I have referred to.

It would help to push automation in order to save manpower, but that is costly, and a new problem may be *capital shortage* because both the *United States* and the *United Kingdom* will have to reduce their capital exports for balance of payments reasons. Therefore, continental Europe may have to play a more active role in the provision of capital for investment. A better organisation of some European capital markets may be required, and the *OECD* is studying this problem at this very moment.

With American investments in Europe has gone a valuable transfer of American technology. Here, also, Europe may have to become more self-sufficient and the *OECD* is considering how to further science co-operation among European countries with this in view. That, too, is costly, but some European countries in balance of payments surplus have been accumulating unproductive monetary reserves in excess of their needs. It would be good for Europe and for the international monetary system if a certain part of these reserves were spent constructively in a more liberal import policy.

This brings me to the last question that I want to mention. If the *United Kingdom* and other *EFTA* countries join the Common Market, there will be more free trade within Europe, but there will be more European trade discrimination against non-European countries. If, at the same time, some Commonwealth countries get increased access to the continental European market while the associated African countries perhaps get trade facilities in *EFTA* countries, then misgivings are bound to increase in those developing countries that are excluded from the preference systems.

Obviously, the creation of such a large preference system will lead to pressure from outside countries, developed and developing, for tariff concessions from Europe. To my mind, it would be better for Europe to take the lead and make an offer. In fact, such an enlargement of the Common Market might be an appropriate starting point for a new round of GATT negotiations on tariff reduction, a post-Kennedy Round where the interests of less-developed countries would be taken particularly into account.

I have sometimes felt that the discussion on European integration has been too inward-looking. If Europe made a trade expansion gesture towards the outside world, as I have just indicated, it would certainly be in the spirit of the *OECD*.

(1) See the article on page 27.

TRAFFIC CRISIS IN THE CITIES : NEW APPROACHES TO SOLVING THE PROBLEM

The volume of traffic in most European cities has at least doubled during the last decade, and in a number of capitals has increased substantially more. Vienna, for example, has experienced a rise of almost 500 per cent in the number of cars in circulation.

Aside from the resulting traffic congestion - which in some cases has reached crisis proportions - the rising influx of automobiles into the cities has caused additional noise, fumes, and a general deterioration in the amenities of urban life.

This is one of the conclusions reached by an expert group set up by the European Conference of Ministers of Transport (ECMT) to investigate the traffic problem. The findings of these experts and their recommendations have been approved for publication by the Conference and will shortly be available in a report entitled "Problems of Urban Transport".

Since, in the highly industrialised countries, as many as 80 per cent of the nation's residents live in urban areas, the problem of traffic congestion in cities has become a matter of concern for national governments as well as the capitals themselves, and central governments are contributing financially, technically and administratively to its solution.

The United Kingdom's Ministry of Transport set up a study group, headed by Colin Buchanan, whose report "Traffic in Towns" published in 1963, is considered to represent a radically new departure in the study of traffic problems. British government funds also go to support experimental work of the Road Research Laboratory. The German and Belgian Governments have set up special governmental commissions to look into traffic problems; and in France the Ministry of Public Works and

Transport has a special service for traffic research (the SERC). Many other such examples could be cited.

The comprehensive approach

As a result of recent investigations new approaches to the solution of traffic problems are emerging. Traditional measures of traffic management such as the creation of oneway streets, prohibition of turns across the traffic, separation of local and through traffic, the reservation of one lane to be used in the direction of greatest traffic flow (the "tidal flow" system) are still considered to be of great importance. It is estimated, for example, that systematic application of traffic engineering in Central London permitted

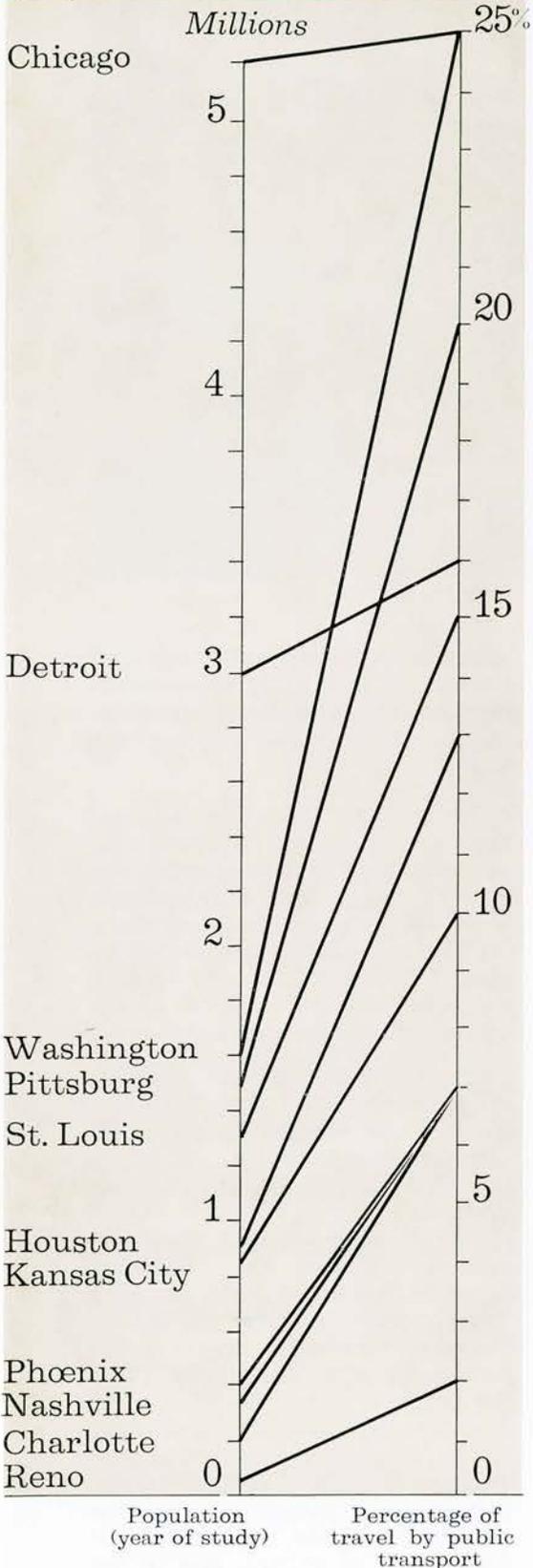
an increase in average journey speed of 12.5 per cent between 1962 and 1964 (from 10.4 to 11.7 miles per hour).

Other short-term measures — the restriction of parking, the reservation of certain lanes for buses and taxis (used in London, Milan, New York and Paris), limiting or taxing the entry of cars into the city — also continue to receive attention. Thus the UK Government, to cite only one example, has been investigating the technical feasibility of installing inside each car electronic meters activated by control cables in the road so that automobiles entering the city might be charged a fee which could vary according to the amount of congestion prevailing at the time.

Measures of this sort will continue to be an important weapon for combatting traffic congestion in the years to come, not in isolation, however, but as part of an integrated plan which includes long-term improvement as well as short-term restrictions. Untangling automobile traffic is now considered to be closely related to the problem of providing adequate public transport. And planning for both private car and public transport systems is intimately linked to plans for the overall physical development or redevelopment of the urban area. At the same time piecemeal solutions for the centre of the city are giving way to plans which go beyond the confines of a single administrative unit to include the entire urban and sub-urban area. The keynote to the new thinking is comprehensiveness.

The traffic crisis forces itself upon public attention primarily as a malfunctioning of the transport system, note the ECMT experts, but the solution cannot be found in the transport field alone. In the longer term physical reconstruction and the relocation through planning measures of industrial, commercial and social activities will be necessary. Any solution must take account of general town-planning considerations. Transport and land use are now so closely interrelated and react so directly upon each other that resources and effort devoted to the planning and pro-

AS POPULATION INCREASES,
PUBLIC TRANSPORT
BECOMES MORE USEFUL -
AND MORE USED



vision of transport infrastructures, the organisation of public transport services and the regulation of urban traffic will be largely nugatory unless they are applied in the closest association with parallel plans and measures in the fields of land-use planning and urban development.

An orientation
towards research

The base of the new planning is a thorough review of existing transport facilities and the projection of likely future needs. In the past traffic research has main-

ly been concerned with forecasting the likely growth in the number of vehicles, but new techniques have now been developed which take into account the widest possible variety of elements and which attempt to quantify them. One approach is to build up a mathematical model of the city, as it is and as it is expected to be, taking into consideration the various social and economic factors that determine land use and the need for transport. The cost of building such a model (for Continental European cities) has been estimated to range from 1s.6d. (10 cents) per inhabitant for a city of over a mil-

A modern monorail for rapid mass transportation links downtown Tokyo with its International airport.





Along the Paris quais, a special lane has been reserved for buses and taxis.

lion, to 3s. for smaller cities. Once the model has been built, it can be kept up to date for up to twenty years by feeding new information into the computer. Attempts are also being made to quantify the elements that enter into a traveller's choice of one form of transport over another. In a recent French study, for example, it was found that individuals behaved as though they valued time spent travelling within the city at 3 frs. (60 cents) - much less than their average hourly wage. Time spent in waiting for transport or making connections, on the other hand, was valued twice as high.

Some specific projects

The new comprehensive approach cannot as yet claim any dramatic improvements, for it is both of recent origin and essentially long term in character. But many cities have taken the first steps. The Greater London Council set up in 1965 covers the whole built-up area of the conurbation (640 square miles) as compared with the smaller area of

117 square miles of the old London County Council; and the powers of this new body include not only responsibility for traffic and major highways but for the physical planning of the area as well.

In Stockholm new radial lines are being added to an underground railway of which the first link was opened in 1957. (The maximum distance will be 20 kilometres to keep travel time to a minimum.) At the stations of the underground railway there are free parking lots (those in the city are purposely made expensive) so that commuters can "park and ride". The stations also serve as nuclei for suburban shopping centres and apartment buildings, and the plan is to have relatively dense population around the station with green zones in between like pearls on a string. The city itself will be provided with a ring road around the crowded inner circle and two highways across it.

Tramways in the heart of Brussels and several German cities are being moved underground to ease traffic congestion, but the tunnels and other installations will be constructed so as to be able to

accommodate a rapid underground railway when the city's population justifies the additional expenditure necessary to replace the trams.

In the US, recently enacted federal legislation requires that, as a condition of receiving federal aid, all towns with a population of 50,000 or more draw up plans for the co-ordination and development of individual and public transport, having regard to the overall development of the area.

The traffic problem is easier to prevent than to solve, and great pains are being taken by planners of new towns — Runcorn and Bletchley in the United Kingdom, for example — to build physical plans around transport systems so that the problems found in the large cities of today will not be repeated in the future. But for the motorist caught in the tie-ups that now plague big cities, the experts also provide some comfort: new forms of ultra-rapid public transport, devices that prevent the escape of exhaust fumes, peripheral highways, and a new concept of urban redevelopment offer hope of solving one of the most difficult current problems.

FOREIGN SKILLS AND TECHNICAL ASSISTANCE IN ECONOMIC DEVELOPMENT ⁽¹⁾

by Angus MADDISON, OECD Development Centre

Rich countries have a much higher stock of educated and skilled people than poor countries, and it is clear that most of their productive achievements depend on the availability of these skills. In two of the countries which have most recently made the transition to development, i.e. the USSR and Japan, educational programmes played a major rôle in the strategy of growth. It is also clear that the lack of skills in developing countries is a major barrier to accelerated growth. In order to fill gaps in the domestic stock of skills and to strengthen the educational and training effort there has been a large-scale use of foreign skills and training facilities. The total cost of foreign skills and training for developing countries amounted to \$4 billion in 1963 or about 2 per cent of the GNP of developing countries. As these resources are so important to economic growth it is highly necessary that they be used efficiently.



The supply of foreign skills

In relation to the number of skilled personnel in developing countries, the input from the outside world is rather small. The manpower provided under technical assistance programmes is around 100,000 and from other channels about 160,000. The importance of foreign manpower varies considerably from one country to another and for different sectors of the economy. In Greece and Brazil it is about 0.5 per cent of domestic high-level skills, in Mexico about 1 per cent, and in Africa South of the Sahara the majority of the high-level skills are possessed by foreigners. However, even where the overall ratio of skill imports is small, foreign manpower has played a key role, e.g. in energy and oil refining in Greece and the automobile industry in Brazil — in these sectors in these two countries, foreigners provided about half of the high-level skills.

There are seven main channels through which foreign skills are supplied to underdeveloped countries. The most important of these are skills supplied by foreign private investment and by bilateral technical assistance.

Bilateral technical assistance of Western countries

Bilateral technical assistance of one kind or another is given by seventeen OECD countries. In 1963 the total expenditure of these countries on technical assistance was \$ 850 million and they supplied around 82,000 people. 38,000 of them were teachers at various levels and a large part of the rest were doing operational work. About 8,000 of them were advisers, mostly on technical matters but sometimes on questions of general policy. About 4,000 were working on health and sanitation, about 5,500 on agriculture and 8,800 on industrial matters. *(continued on page 12).*

(1) Angus Maddison is the author of a recent study published by the OECD Development Centre under the same title.

More than 96 per cent of technical assistance personnel are supplied by four countries, France, the United Kingdom, the United States and Belgium. The other OECD countries supply together only a little more than Belgium. More than half the total are supplied by France alone, and the numbers supplied by the UK are also much greater than those coming from the US.

Four-fifths of the manpower supplied by technical assistance goes to African countries which were recently colonies. In 1963, over 66,000 people were serving in Africa under technical assistance programmes of OECD countries. Almost half of technical assistance manpower is designed to strengthen education. Most of the other personnel play a key role in public administration where their role is to build up (or, in some cases, hold together) the fabric of society in a period of transition and establish the preconditions for growth. The role of technical assistance in Africa is very large in relation both to local skills and other foreign sources of skills.

Outside Africa, the quantitative importance of official technical assistance personnel is very small indeed, both in relation to local skills and foreign skills provided through other channels. The foreign manpower supplied for investment and development projects comes largely via foreign private investment or it is bought directly on a consultant basis by underdeveloped countries. It is noteworthy too that outside Africa the technical assistance effort of the three ex-colonial powers is no bigger than that of other OECD countries combined.

The present concentration of technical assistance personnel on Africa seems rational. In fact, as far as the supply of school teachers is concerned, it would be worth considering whether the limited resources should not be devoted even more to Africa.

Technical assistance from communist countries

Most of the manpower supplied by communist countries is provided in connection with capital aid projects. Nearly all of it is financed by loans rather than grants. Hence it is analogous to the Western manpower supplied by private foreign investment rather than official Western technical assistance programmes.

This aid has been heavily concentrated. India, Cuba, Egypt, Afghanistan, Guinea, Mali, Ghana, Somalia, Sudan, Ethiopia, Yemen and Algeria have been the main beneficiaries.

The biggest projects carried out by Russian aid have been the Aswan Dam which occupied 1,500 Russian engineers, the Bhilai steelworks in India, and the network of roads and airport construction in Afghanistan. The number of people provided by Sino-Soviet aid is not known with any precision, but an authoritative source puts the figure at about 11,000.

Probably half of Soviet personnel are of middle-level. The USSR has for instance supplied more foremen and middle-level personnel on construction projects in Afghanistan and India than would have been the case in Western programmes of this type.

Multilateral technical assistance

In 1963 multilateral agencies supplied about 8,000 experts to developing countries, i.e. more than any single donor country except France, the United Kingdom and the United States.

The biggest of the multilateral sources is the United Nations which spent about \$ 120 millions on technical assistance in 1963. The UN activities are fairly widely dispersed throughout the developing world, and are administered by the specialised agencies as well as the UN itself. The International Bank (IBRD) and the International Monetary Fund (IMF) have done a steadily increasing amount of advisory and training work which has grown out of their normal operations. Apart from the UN there are other multilateral agencies with programmes costing perhaps \$ 30 million a year in total. In 1964, the Organisation of American States (OAS) spent \$ 6.5 million on technical assistance in Latin America, and in addition to this there were expenditures from a special development assistance fund and programmes of the OAS specialised agencies — the Inter-American Institute of Agricultural Sciences and the Pan American Health Organisation. The Inter-American Development Bank has carried out technical assistance operations and pre-investment studies which from its founding to the end of 1964 cost about \$ 34 million. OECD has a small technical assistance programme for its developing Member countries of about \$ 2 million a year. There are small technical assistance programmes of the North Atlantic Treaty Organisation (NATO), the South East Asia Treaty Organisation (SEATO) and the Central Treaty Organisation (CENTO) of a non-military character. The European Economic Community (EEC) also has substantial technical assistance activities in countries associated with the Common Market.

International agencies have certain advantages as suppliers of technical assistance. Their operations enjoy economies of scale as compared with the activities of a small donor country. They solve some problems for developing countries by shopping around in many countries for experts or training facilities. They can create special international training courses and training institutes and ensure that developing countries benefit from the widest range of expert experience; they can build up better rounded teams of experts.

In this respect their aid is "untied", whereas bilateral technical assistance is the most tied form of aid. In some technical fields these organisations have been able to build up an expertise which would be impossible for a single developed country to provide.

Multilateral agencies also suffer from certain disadvantages. They often try harder to "sell" their services than do national technical assistance agencies and there is sometimes competition between UN agencies. In some cases this pressure can accelerate development by introducing new ideas but it can also divert resources into non-priority fields. The United Nations in particular has a major problem of internal coordination.

Personnel working on projects financed by capital aid

In the course of 1962 and 1963, the annual amount of funds committed to project-tied aid by Western donors and multilateral institutions was between \$ 3.3 and \$ 3.5 billion. In many of these projects the donor or lender assumed some kind of responsibility for supplying high-level skills — such as the steel mills at Rourkela and Durgapur in India which were financed by German and British aid. A rough estimate would suggest that about 9,000 man-years of foreign engineering skills has accompanied these projects.

Know-how transferred under private investment

There are five types of skill provided by foreign private investment. The first is *entrepreneurship*. In some cases foreign firms spark off a development which local people cannot spot because of their limited experience, or foreigners are able to exploit an opportunity not open to local people because of deficient capital and skills. The second type of skill provided is *management*, which is geared not so much to the flow of investment but to the stock of foreign assets. There are *maintenance* and *sales* personnel. Finally, there are people who install equipment and *construct* new plant. Only the latter category of personnel is usually involved in aid financed investment, and it is because of the much wider range of functions provided by foreign private investment, that its skill contribution is so much larger.

It seems likely that the technical and managerial personnel employed as a result of foreign direct investment in developing countries amounted to about 100,000 people in 1962.

It has been suggested that the number of foreign personnel is sometimes inflated because they enjoy a better standard of living than they would at home and tend to defend these privileged jobs. This was undoubtedly the case in many countries in the past, but increasing nationalist pressure now tends to offset this tendency. We found little evidence of this excess of foreign personnel in our studies of Mexico and Brazil. Foreign enterprises have brought in foreign personnel at early stages of production to get plants working, have trained local people quickly and then reduced the foreign staff to insignificant proportions.

However, as both of these countries have had a very dynamic industrial expansion there has always been a large number of new firms at any one time with considerable numbers of foreign personnel. In both countries powerful development banks have ensured that foreign enterprise has played a progressive role in economic development.

Foreign investment in Mexico and Brazil has been widely dispersed throughout manufacturing so that its impact in creating new skills has been proportionally higher in relation to the amount of capital involved than in Venezuela, Iran or Chile where it has been concentrated on oil and other minerals and has done relatively little to develop local skills. In Mexico and Brazil, foreign investment has represented about a quarter of the total for manufacturing, and enterprises have often been mixed ones with both local and foreign capital. In these countries industrial expansion has been very rapid, growing at 9 per cent a year in Brazil and 6 per cent in Mexico. An appreciable heavy industry has been developed. There has been a great deal of import substitution and both countries are becoming exporters of industrial goods. In neither country has shortage of skills been a serious impediment to growth.

In Mexico, the leading role in industrialisation has been played by Nacional Financiera, a government development bank which has assets of about \$ 2 billion. In the past its selection of companies for financing was done largely on the basis of response to requests it received, with a bias in its lending toward state enterprises or firms which would produce import substitutes. It has always helped Mexican firms to find foreign partners with technical know-how. Now it is trying to influence the development path more directly by picking on products which have linkages with other types of production in Mexico, which can help to use Mexican capacity more fully, or which can exploit Mexican raw materials. Having decided on the product, it seeks out people who are likely to be able to develop production of these goods. It enquires from IBRD for lists of firms in different countries which specialise in a field it wants to develop and then it tries to make the best deal it can after investigating these firms.

Nacional Financiera itself does very detailed pre-project analysis and always has a large file of detailed projects which are possible candidates for finance. A recent exercise on a new steel plant included cost studies for different scales of production, and for 18 alternative locations. Nacional Financiera has taken over some of the entrepreneurial functions from foreign enterprise and is steering it in directions which it considers to be needed by the Mexican economy. This is a very important innovation for it is often held that the inflow of foreign enterprise in developing countries can distort their growth path.

It would seem, therefore, that foreign private enterprise can play a key role in supplementing the skills needed for economic growth. Yet the flow of foreign

investment is declining, and the nationalisation policies of several developing countries have considerably reduced or eliminated their possibility of receiving foreign private capital. This has happened in Egypt, Ceylon, Burma, Indonesia, Cuba and Algeria.

The reasons for antipathy to foreign private investment are quite clear. Newly independent countries feel disturbed if the most modern sector of their economy is controlled by foreigners. When they are faced with payments difficulties they regard remittances of dividends and interest with suspicion, particularly as foreign direct investment usually yields returns which are high in relation to the rate of interest on inter-governmental debt. This sort of nationalist feeling is not confined to developing countries. It has been very strong in Canada, and has been felt in France and the United Kingdom as well.

Furthermore, the traditional pattern of foreign investment did not produce the results we have observed in Brazil and Mexico where powerful local institutions have ensured that local people are trained for jobs and that local business participates in the profits. A great deal of direct investment in developing countries has been in plantation agriculture, and in oil and mineral development. Most of the high and middle-level personnel in plantation agriculture were Europeans, and this used to be true in the oil industry until the Iranian nationalisation. Similarly the Suez Canal Company did not train Egyptian pilots.

With the end of the colonial era, this situation has changed, and these old attitudes of private investors have disappeared. Unfortunately, many private investors have simply given up projects in developing countries, and countries which have nationalised foreign enterprises have also tended to write off foreign private investment. This is very unfortunate, as private investment is a major channel for providing certain skills.

It is clear from Mexican experience that firms in developed countries are quite willing to take business risks in developing countries and provide know-how. They want a reasonable return on their capital, but they are often just as interested in preserving their brand name and international reputation in a market which is being closed to them as exporters. For this they do not need a large financial participation in the enterprise. What developing countries need in order to attract them is a strong development bank which can attract foreign investment with some financial guarantees and ensure that it plays an adequate role in developing local skills. Legislation concerning foreign investment is not enough to ensure this process. There must be an institution capable of making an intelligent appraisal of the actual and potential performance of foreign business, capable of attracting it, and directing it to sectors where its contribution is most needed.

Developed countries can also do more to promote the right kind of contributions from foreign capital. Several OECD countries have legislation granting tax favours to investment in developing countries, and the

US Government subsidises pre-investment studies intended to facilitate private investment. But in no case does it appear that a financial incentive is given to firms to help specifically in providing skills and training for industrial growth.

Skills supplied by private donations

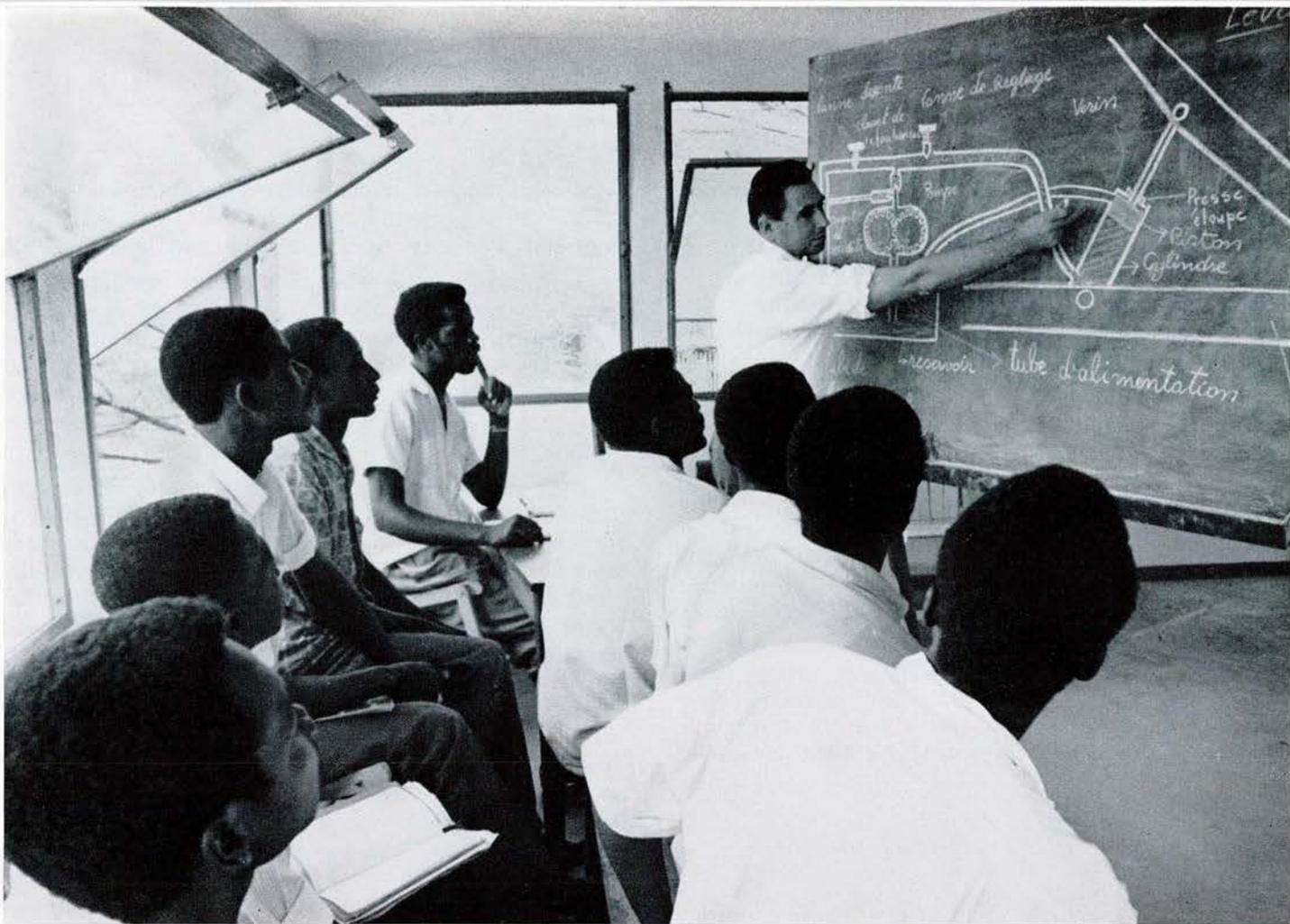
Private voluntary organisations provide overseas personnel or training in one form or another on a fairly large scale. The flow of people supplied by voluntary agencies varies a good deal in character. Most of them provide services which they think developing countries should have, and these do not always meet priority needs for economic growth. A good many of the people supplied are carrying out social, relief, religious, or trade union work. But they also supply doctors and teachers, and a good many of them provide personnel for education institutions — such as the World ORT Organisation which provides schools for vocational training in various countries. There are several important private American schools and universities such as Robert College in Istanbul or the American University in Beirut.

More recently there has been a rapid growth of organisations of young volunteers, and in many countries there has been a growing tendency for donor country governments to subsidise private agencies. This is particularly true in Germany, the United States and the United Kingdom. Perhaps the most effective part of the private effort is the work of the foundations, particularly Ford and Rockefeller. Their programmes are designed with great professional competence, and they have been able to take a long term view and build up institutions of high quality. In view of the difficulty in finding suitable personnel for overseas service, governments find it very useful to co-operate with private agencies which can mobilise enthusiasm for service overseas. One problem in this co-operation is that private activities are extremely diffuse and in some countries, particularly the UK and US, these agencies are traditionally chary of co-operation with governments.

Sales of consultant or contract services to developing countries

There are a growing number of consulting firms which sell pre-investment services, feasibility studies, or provide general economic advice to developing countries, such as SEDES, SEMA, etc., in France, Arthur D. Little and Stanford Research Institute in the United States, and Doxiadis in Greece. The Côte d'Ivoire alone spent nearly \$ 2 million a year of its own funds on surveys of this type by foreign firms.

In Africa, it is necessary to import architects and surveyors for nearly all sizeable construction projects, and in other places there are some big construction projects not financed by aid, e.g. the Guiana dam in



One of the qualifications which is becoming more and more necessary in the developing countries is the knowledge of the handling of all kinds of machinery. Here Congolese mechanics and drivers take a training course in a pilot workshop.

Venezuela which will absorb 1,500 foreign technicians. Some US companies have sold their services to Latin American firms — both nationalised and private — for construction purposes. The fertiliser plant of Guanos e Fertilisantes in Mexico was supervised by the Chemical Construction Company of New York. American firms helped to construct the Volta Redonda steelworks in Brazil and Altos Hornos in Mexico on a fee-paying basis.

Recently the practice of selling plants on a turnkey basis has spread. Under this system foreign firms will provide all necessary designs and supervision until the plant is in working order. One disadvantage of this system is that indigenous personnel do not obtain adequate training and experience in design and construction.

Payment for the services of the manpower required for the installation of foreign machinery is usually included in the sale price of the capital equipment. About \$ 8 billion of foreign machinery is imported from developed countries, and probably \$ 6 billion of this is financed neither by foreign private capital nor project aid.

In the past there was some sale of managerial services through the managing agency system — an institution created in British India, but which has now practically been replaced by the device of joint enterprises.

A few thousand people are hired by developing countries for non-economic tasks such as university teaching and medical work, and some African countries,

such as Nigeria or the Côte d'Ivoire, themselves hire foreigners for administrative work.

Other forms of consultancy services which are purchased by developing countries are those of recruiting agencies, market research, legal, banking, advertising and public relations, etc. US research laboratories and non-profit making institutions such as the Armour Research Foundation, the Batelle Memorial Institute, the Mellon Research Institute and Stanford Research Institute, have helped Latin American institutions with research.

OECD surveys made in Turkey and Greece show that in each country, private firms spent about \$ 1.5 million a year on foreign surveys, technicians and training, but it was clear that such purchases are made only by rather large firms, so that governments which wish to accelerate the introduction of foreign technology will probably have to create special institutions such as productivity centres to make it available to small firms.

In summary, therefore, the supply of foreign manpower to developing countries seems to amount to around 90,000 via bilateral and multilateral technical assistance, around 11,000 from communist countries, 9,000 under capital aid, around 100,000 from private foreign capital, around 15,000 under voluntary organisations and perhaps 40,000 through other channels. This makes a total of around 260,000. Probably about half of these were middle-level people and about half were high-level. The area distribution of these people

(apart from technical assistance experts) is not known but their proportionate importance relative to local skills is highest in Africa which absorbs four-fifths of technical assistance personnel. On top of this a large proportion of the "local" high-level manpower in Africa South of the Sahara consists of foreign settler populations from Europe and Asia.

The foreign contribution to training

Foreign skills can fill gaps in the skill of developing countries, increase their capacity to absorb capital and greatly accelerate their growth. In the long run, however, developing countries must be able to produce their own skills in adequate amounts if they are to put their growth on a self-sustaining basis and attain a real national independence. Foreign assistance must therefore give high priority to strengthening those aspects of the education and training effort of developing countries which are relevant for their economic growth.

Primary education

The task of mass education in developing countries is so very large that there is little hope that developed countries can provide any significant help in terms of foreign teachers, although some of the voluntary agencies and French technical assistance do provide elementary teachers. There are about 400 million children in developing countries aged 5-14, and there would be little hope of meeting any significant part of the need for teachers at this level from the outside, particularly as a good deal of this teaching is in languages not known in developed countries.

It should be possible to provide material help in the form of equipment for schools, help with personnel in teacher training institutions, help in devising suitable curricula and textbooks, in improving techniques of school building and in financial aid. In view of the limited resources of developing countries, it would be useful to help them develop more economical methods of teaching than those used in Europe today. They do not have to use the same techniques as those used in Europe in the nineteenth century when older children were used as monitors and classes were very big, but their task could be eased by help in developing television networks, educational films and teaching by radio.

Secondary education

The bulk of secondary education in developing countries is designed as a preparation for higher education, and only a small fraction of it serves to provide terminal training for the middle-level skills which are urgently needed. The preparatory education is usually inadequate in providing scientific textbooks and equip-

ment and teachers of mathematics, physics and chemistry. However, the main problem is usually in terminal secondary education for middle-level skills.

Technical schools for middle-level specialists can play a vital role in providing the skills needed for accelerated economic growth and are all the more necessary in developing countries because of the limited possibilities of in-service training. Technical assistance can play a considerable role in providing staff for such schools or in training their teachers.

In most countries, facilities for middle-level agricultural education are even worse than for industry. In some cases students are so reluctant to undertake agricultural work that existing facilities are not fully used (this was a complaint by the Ashby Report on Nigeria). This kind of training is vital for economic growth and should be given greater encouragement by developing countries and by donors of aid. It should be accompanied by intensive agricultural research so that the instructors will really have something sound to teach to conservative peasants — who know that existing methods may be backward, but that the penalty for mistaken innovation may well be death by famine. Professor Arthur Lewis has suggested that there should be one rural extension worker for every 1,000 rural workers, but most countries are very far from this goal. In order to get people to work in agricultural extension, most developing countries will have to make a drastic revision in salary scales and status for this kind of work.

Other middle-level skills important for development are teacher training, nursing, accountancy and secretarial services. Most of these skills should be provided by local training institutions and a major task of technical assistance is to build these up. UK technical assistance has helped, particularly with teacher training.

There is a good deal which developed countries can do to ease the problem of industrial training. Practical training facilities can be improved by provision of equipment and teachers for vocational schools. This is given major emphasis in German technical assistance, and Israel also puts most of its effort into helping produce middle-level skills. Work of this kind has also been done by the International Labour Organisation, and by ORT. However, middle-level training for industry has not been a strong point of US, British, and French technical assistance. These countries have larger technical assistance programmes than Germany but have put most of the emphasis on high-level skills and training. Of the 38,000 teachers supplied to developing countries by the technical assistance programmes of OECD countries, only 3,000 were in middle-level technical or vocational schools.

Help can be provided by practical training in developed countries. In many industries, it would be impossible to reproduce this training in the country of origin, and the trainee learns the work habits and discipline of industrial countries as well as specific techniques. In 1962, about 26,000 practical trainees received technical assistance grants for courses abroad.

THE RATIO OF SELECTED TYPES OF SKILLED MANPOWER TO THE LABOUR FORCE, 1959

		SCIENTISTS AND ENGINEERS	DOCTORS, DENTISTS, PHARMACISTS AND VETERINARIANS	SECONDARY AND HIGHER TEACHERS	SUM OF THREE COLUMNS
DEVELOPED COUNTRIES	France	0.8	0.4	0.6	1.8
	Italy	0.9	0.6	1.0	2.5
	United Kingdom	1.0	0.3	0.7	2.0
	United States	1.7	0.7	1.0	3.4
	Canada	1.3	0.5	0.9	2.7
	USSR	1.2	0.4		
DEVELOPING EUROPE	Greece	0.4	0.5	0.4	1.3
	Spain	0.3	0.6	0.3	1.2
	Turkey	0.2	0.1	0.2	0.5
	Yugoslavia	0.5	0.2	0.3	1.0
AFRICA	Guinea	0.002 ¹	0.007	0.016	0.025
	Nigeria	0.01	0.01	0.05	0.07
ASIA	India	0.05	0.1	0.3	0.45
	Iran	0.16	0.1	0.2	0.46
	Pakistan	0.05	0.03	0.2	0.28
	Philippines	0.24	0.42		
	Taiwan	0.1	0.2	0.6	0.9
	Thailand	0.01	0.03	0.1	0.14
LATIN AMERICA	Argentina	0.2 ¹	0.4 ²		
	Brazil	0.1 ¹	0.2	0.4	0.7
	Colombia		0.1	0.5	
	Peru		0.2	0.6	
	Mexico		0.2	0.4	

1. Engineers only. 2. Doctors and dentists only.

An even larger number came under their own steam, or were sent by their firms, but it is only the largest firms in developing countries which are able to finance such trips from their own resources. The total number of trainees going abroad in 1962 was probably about 66,000, and about half of these were middle-level personnel.

Higher education

Most developing countries have provided higher education in the past for their élites, and the number of students and graduates is often quite high. However, many training institutions do not concentrate sufficiently on the field most relevant to economic growth, and their quality standards are often low. The possibilities for acquiring practical experience and training have been limited by the small size of the industrial sector.

There is usually excessive emphasis on arts subjects because the examinations are easier or facilities are

cheaper to provide. In many countries there is a tendency to enrol students who are not properly qualified, so that higher education institutions are burdened with low quality students who drop out before their courses are finished or who fail their examinations.

The main role of technical assistance in higher education is to bolster the quality of scientific and technical training, help create specialised training institutes for scarce skills, and to insist that the countries being helped take adequate measures to improve the future quality of higher education. There is scope for a considerable expansion of the type of arrangement made by the International Development Association with many American universities, whereby they adopt sister institutions in developing countries. They help raise standards there by sending their own faculty members as visiting professors. They provide further teaching experience or graduate training abroad for local staff, and gifts of equipment and books. In some cases it may also be necessary to provide subsidies (disguised or open) to the pay of local people. This

long-term co-operation in institution building is extremely fruitful for both sides.

British and French technical assistance as well as the Ford and Rockefeller Foundations also do a good deal to help higher education in developing countries though their methods are different from AID. About 30 higher education institutions have already been created in Africa South of the Sahara, mostly in the past few years, and there is an obvious need for technical assistance to build them up. Wherever possible these institutions should be encouraged to specialise, and take students from neighbouring countries.

The Tananarive Conference of UNESCO set a goal of 274,000 students in Africa South of the Sahara by 1980, which is more than a twentyfold increase. It aimed at getting 60 per cent of enrolments in science and technology instead of the present ratio of 35 per cent. In order to achieve these goals, the need for expatriate teaching personnel in higher education would rise from 1,600 in 1961-1962 to a peak of around 3,000 in about five years, declining to a smaller number in 1980.

Bilateral technical assistance of OECD countries provides about 2,400 of the 200,000 university teaching staff in developing countries. In Africa South of the Sahara about three-quarters of the total university teaching staff are expatriate.

Considerable financial help has been given to higher education by aid programmes of the UK, France, the US and IBRD. Some help has been given with books and equipment, but this kind of help could usefully be given on a much larger scale. Unfortunately, some donors of technical assistance treat gifts of equipment as capital aid and are much less generous in supplying it than if it were considered as technical assistance. As skilled people are so scarce there is every reason to be generous with books, translations and equipment, which to some degree can substitute for skilled people.

Study abroad

The easiest option for a developed country which wants to help higher education facilities for developing countries is to provide scholarship for study abroad, or at least to make places available in its own universities. This has been done on a massive and growing scale in the past decade. In 1962 the total number of people from developing countries who were students in higher education institutions in developed countries was 138,000; about 127,000 of these were in developed OECD countries.

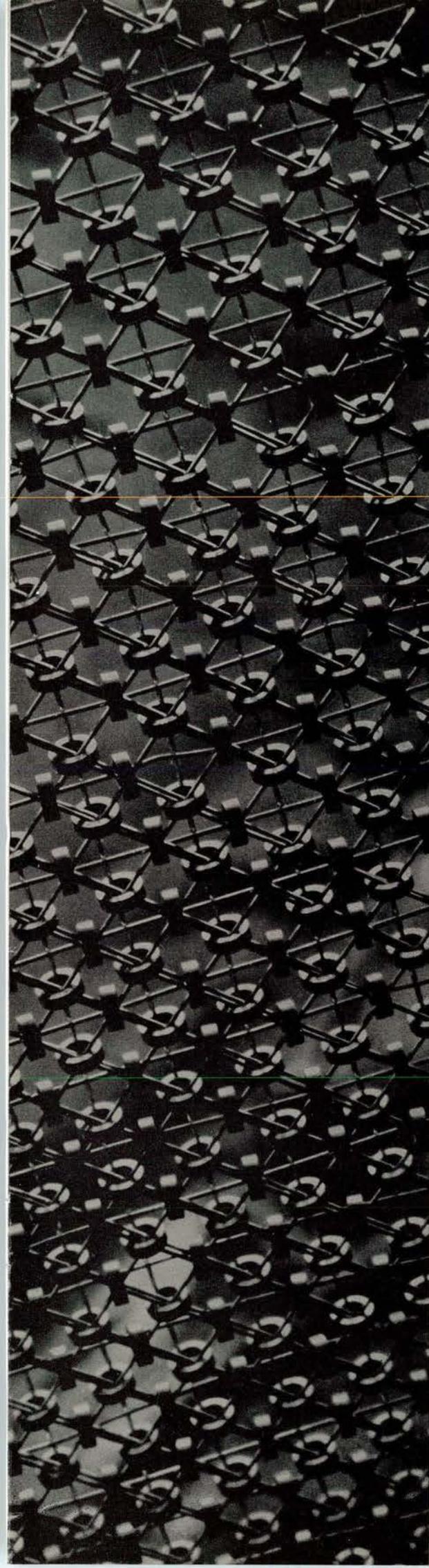
The benefits of study abroad should not be measured by the number of students abroad, but in terms of returned graduates. A major source of wastage from the viewpoint of developing countries is the non-return or prolonged absence of students who find jobs or scholarships abroad that are more attractive than jobs at home. The Greek evidence shows that graduate students who have received government scholarships

or foreign technical assistance grants nearly all return home, but there is a large loss of people who go for privately financed undergraduate training or who were recipients of some types of cultural exchange scholarships. In the case of Iran, Taiwan, and Korea, it has been estimated that during the past ten years less than 15 per cent of their students studying in the USA have returned home. This loss is also important in African countries.

Political instability has been a cause of non-return of some students, but in many cases it is due to the fact that high-level skills are not properly rewarded or that insufficient attention is paid either to providing proper job opportunities or to information about them. It is quite understandable that students from developing countries who have been thousands of miles from home for several years, will hesitate to return if they can get jobs easily in developed countries at several times the salary they think they can earn at home. This is particularly true if they have acquired the consumption habits of developed countries or foreign wives.

Although there are dangers in excessive reliance on study abroad, it is an extremely profitable process if it is properly managed and if the students are well selected. Its cost is not high compared with some other types of technical assistance, and the supply of such training is no real problem. Study abroad has played an indispensable role for Africans who previously had no facilities at home. Some developing countries may always be too small to provide economically for undergraduate students in particular faculties, and students from these countries will continue to need foreign training. It provides particularly valuable possibilities to graduate students. To these mature students it provides an acquaintance with the highest standards of scientific methodology and scholarship which they cannot usually obtain at home. It is necessary at this level to have cross-fertilisation of knowledge by study abroad, and it is perfectly normal in developed countries for students to do post-graduate work abroad. It is very difficult to build up highly specialised research facilities on an adequate scale even in very large countries.

Although official technical assistance programmes are moving towards the type of strategy for helping higher education which we have suggested, this is not true of the effort of the private sector. Usually training institutions in developed countries assume that they have a moral obligation to favour the entry of students from developing countries, sometimes at the expense of their own nationals. This indiscriminate policy often does more harm than good to the developing country, and should be strongly discouraged. It is highly desirable that donor countries should discuss these problems with non-governmental agencies and universities in an attempt to coordinate national policies, as many of these scholarships are provided from private sources. The frame of discussion should include the provision of university and technical college places and should not be confined to the issue of scholarships.



STATISTICS:

the foundation
of economic decision taking

by René BERTRAND,
Head of OECD
Statistics Division

Virtually all the economic analyses undertaken by OECD, and the decisions which arise from them, are based on the work of statisticians. The economic situation of a Member country, and the probable outcome of the policies it adopts, can only be assessed if the policy-makers are in full possession of the economic facts: national accounts, up-to-date balance of payments figures, and a wide range of indicators of production, prices, wages, employment, stocks and consumption. Over the whole range of its interests, the Organisation bases its activities on a foundation of reliable and highly developed statistical information.

Under present conditions, therefore, an ever-growing mass of statistical data is put at the disposal of Member countries of OECD, representing annually several million figures contained in more than 10,000 tables of all kinds.

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Direction, arrangement and integration of statistics

It is only comparatively recently that the collection of statistical data has become more than a simple by-product of administrative activity. For example, the systematic registration of international trade statistics is an outgrowth of the basic responsibility of the Customs authorities. From the supervision of the import of foreign goods into a country, it is a short step to use importers' statements to identify the nature, quantity and value of the products moving in trade.

(continued on page 20)

By contrast, modern statistical work is increasingly directed toward specific objectives. At one time, the analyst was forced to reach his conclusions from a set of figures most of which had been prepared for other purposes. The aims of statistical work are now clearly defined; and they can only be achieved through a coherent programme of organised activity within an appropriate conceptual framework.

Major factors in this change have been the development of processing aids ranging from adding machines to punched card systems. The parallel development of such special techniques as sampling has enabled relatively accurate demographic or economic data for a region or country to be obtained by the interrogation of a limited number of persons.

Electronic computers are the latest stage in this process. Their use still involves a great deal of laborious effort, but they have opened up new horizons in data availability. As a result, the users of statistics have come to specify their requirements with increasing clarity, and, whether in OECD's committees and expert groups or elsewhere, stress is laid on the provision of statistical data which are strong enough to support the analytical structure of which they are the foundation.

Dependence on national statistics

Inter-governmental organisations such as OECD do not conduct their own statistical enquiries in Member countries, but depend on the countries themselves to provide the data they use. In other words, the basic input into an international statistical system is the material available from national sources. These data are rarely comparable. Often they are incomplete; sometimes they do not exist at all. However dexterous the manipulation of this material, the results may not always be fully in line with the specific requirements of the final users of the statistics.

This explains why so much effort is devoted by international organisations to persuading their Member countries to harmonise, standardise, and complete their range of statistics, both on the national and the international level.

Use of universally agreed classifications and definitions is vital in this context. The task of preparing classifications, standardising definitions, or laying down guidelines for statistical activities throughout the world, is carried out by the United Nations, principally by the Statistical Commission in New York and the Conference of European Statisticians in Geneva.

While OECD is closely associated with this work, there are also many fields in which it has itself taken the initiative in order to satisfy its own special requirements. The standardisation of balance of payments reporting in co-operation with the International Monetary Fund is one example of this. The Organisation's emphasis on the use of standardised national accounts for purposes of international comparisons is another. This last, moreover, is not an entirely new activity: an internationally

standardised system was first introduced in 1951 by OECD's predecessor, OEEC, and improved in 1958.

It has since become apparent that a revision is necessary to establish a more complete and integrated system covering the various categories of transactions between economic sectors. This revision, which has been agreed by the UN Statistical Commission, owes much to the contribution made by OECD experts, and it is planned to make the same revision in the OECD Standardised System of National Accounts as in the UN system.

The measurement of research and development costs affecting technical progress, definition of the statistics required for educational planning, accounts for the various forms of aid to developing countries, are among other sectors which have come to the fore in recent years. All are fields in which OECD has pressed for the development of statistical work hitherto relatively neglected.

Development in the right direction

The usual method of reaching agreement on common definitions on the international level, or deciding what statistics are required, is to call together representatives of the countries concerned to agree on a set of recommendations. For example, OECD is at present working on a "Manual of Statistics Required for Educational Planning" with the help of national experts.

Continued efforts by national statistical offices and international organisations are needed to see that statistical norms, once agreed to, are properly applied. Work by OECD, for instance, contributed to the widespread adoption by Member countries of the standard international trade classification as the basis of a registration system of imports and exports.

Close co-operation between the statistical services of the international organisations has been, and will continue to be, an important factor in orienting statistical developments. It is also worth drawing attention to the special role of international statistical publications, such as those of OECD, in this context. Countries which otherwise might not have compiled certain data have often been induced to do so in order to enable international comparisons to be made using as compatible a set of economic indicators as possible — a process which has also been of value in the analysis of the domestic economic situation.

How OECD gathers the figures

Another main aspect of the work of the OECD Statistics Division is the collection of the required data and their "translation" into a common international language.

The collection of statistics by means of questionnaires is not the sole procedure employed: an



Magnetic tape units in the machine room.

important amount of material is gathered from year-books, reviews and other national publications which may provide supplementary information on either data or methods. Clearly a statistical library is an essential working instrument; that of OECD is expanding continuously.

Easier reporting and speedier data

The work of gathering the data has undergone two notable changes recently. In the first place, steps have been taken to lighten the burden on national statistical offices of making regular reports to international organisations. Secondly, given that the value of a statistic is inversely proportional to the length of time required to make it available, emphasis has been placed on the use of modern means of data transmission.

One example of the way in which the reporting burden has been eased is the standardisation of the questionnaires sent out by the various international organisations. The adoption by the International Monetary Fund and OECD of the same form for reporting balance of payments figures has already been mentioned. In other cases the documentation assembled by one body is re-transmitted to others: thus OECD collects and processes data regarding production and consumption of food products, and forwards them to the Food and Agriculture Organisation. The "shuttle" questionnaire is another new development. Here the form is filled in in advance by the international organisations, checked by the national services, and, where necessary, rectified and completed. This method is used, in particular, for current statistics.

The Telex System is increasingly used for the

transmission of data; OECD forms part of a telecommunication network which includes among others national statistical services and the European Office of the United Nations in Geneva. Where the quantity of data is so large as to involve processing by electronic computers, reels of magnetic tape form the normal means of transmission. Ten Member countries at present transmit foreign trade figures on tape to OECD. It may not be too soon to look ahead to the day when the statistical records of the various countries and the international organisations will be entirely reproduced by electronic means and inter-connected by teleprocessing; this will introduce direct and rapid communication between statistical records without human intervention.

"Translation" of national into international information

The data, once available, must be "translated" into a common language to enable comparisons to be made between countries and the totals or averages for groups of countries to be calculated; items must be reasonably compatible with the standard definitions, indices must have the same reference period and the same currency unit — the US dollar, for instance — must be used throughout.

The position until recently was that only foreign trade statistics (which earlier had been processed on standard mechanographical equipment) were being treated by electronic computer. All other material was dealt with by hand. In 1965 OECD's Statistics Division also mechanised the processing of current statistics, a pioneering development in computer utilisation. *(continued on page 25)*

OECD STATISTICAL PUBLICATIONS

Trade

SERIES A. OVERALL TRADE BY COUNTRIES

This series provides full details of the geographical distribution of the overall foreign trade of Member countries both individually and by groups (for example, for EEC).

SERIES B. COMMODITY TRADE ANALYSIS BY MAIN REGIONS

The quarterly Series B cover all Member and Associated countries and the major OECD groups and show the distribution of their foreign trade in terms of value in respect of

280 categories of commodities and 19 major areas of origin and destination. The trade of individual countries in 35 categories of commodities is analysed in supplementary tables.

SERIES C. COMMODITY TRADE DETAILED ANALYSIS BY PRODUCTS

This series lists 367 groups of commodities (420 in the annual edition). To facilitate international comparison, full details are given in 2 matrix tables of the trade of each Member country and all the European countries of OECD, with the main areas and major trading partners, in terms of quantity and value. The value of total trade in 440 other categories of commodities is shown on a separate line.

Current economic situation

MAIN ECONOMIC INDICATORS

The hundred and twenty pages of the monthly *Main Economic Indicators* contain about 1,500 of the most significant indicators from the national statistics of the twenty-one OECD countries, i.e. industrial production, unemployment and job vacancies, retail sales, wages, gold and foreign exchange holdings, foreign trade, etc. The tables are printed by a computer from file tapes and are an essential source of international economic data and an important means for the rapid identification of current economic trends.

COUNTRY ECONOMIC SURVEYS

Main Economic Indicators are completed by a series of *Supplements* (industrial production, index of consumer prices and retrospective annual issue). The Supplement on industrial production gives the indices of most Member countries and major groups of countries by sectors of activity and in a comparable form. Although they are not actually statis-

tical publications, the *OECD Economic Surveys* which are drawn from the countries' annual reviews on financial, monetary and economic policies give a great deal of data assembled during these reviews and presented systematically in a statistical annex.

NATIONAL ACCOUNTS STATISTICS

A special volume of statistics is compiled periodically from national accounts. It contains full information on sources and a number of complete series covering a long period. The last publication in this series was issued at the end of 1963. The national accounts statistics are brought up to date every year and published as an annex to Main Economic Indicators.

MONETARY RESERVES AND BALANCES OF PAYMENTS

The Annual Reports of the Board of Management of the European Monetary Agreement (published, since 1959, in July - August) give comparable data for each OECD

country on changes in monetary reserves and balances of payments, and a comprehensive survey of recent international monetary developments. The main tables show, for each individual country, and for each of the previous two or three years: a summary of the main items in the balance of payments; changes in monetary reserves and certain related transactions (IMF reserve positions, bilateral swap facilities, non-marketable US Treasury bonds and commercial banks' net foreign positions); changes in gold holdings and gross foreign exchange reserves; percentage of monetary reserves held in gold; official capital transactions; overall net movements of private long-term capital.

OECD MEMBER COUNTRIES

A number of the most significant basic statistics have been reassembled in two series of tables, one relating to 1963 and the other to 1964. These tables have been published in the OECD Observer. The information concerns each of the twenty-one OECD Member countries and separate reprints have been published from these series.

Development assistance

THE FLOW OF FINANCIAL RESOURCES TO LESS-DEVELOPED COUNTRIES

This series publishes statistics of the flow of official and private funds showing categories of assistance and recipient countries.

Industry

INDUSTRIAL STATISTICS

These are the main annual statistics of industrial production in the OECD countries. The series published cover long periods, often dating back to the beginning of the century.

STATISTICS BY INDUSTRIAL SECTORS

Industry and energy statistics are compiled by branches under the direction of the appropriate committees which adjust them in the light of technological change and use them to assess current economic trends. As a general rule these figures are published annually and cover production,

consumption, international trade, orders, stocks, manpower, prices, investment, productive capacity, turnover, value added, etc. in the following branches :

- Iron and steel
- Machinery
- Chemicals
- Cement
- Non-ferrous metals
- Fertilisers
- Textiles
- Timber
- Pulp and Paper
- Hides and skins
- Oil
- Electricity

Energy

BASIC STATISTICS OF ENERGY

The publications issued under the title Basic Statistics of Energy are the only source of documentation containing basic statistics of production, trade, transformation and consumption in respect of all sources of energy. They are presented in a logical and coherent form and cover the twenty-one countries of OECD. The main volume provides data for OECD as a whole and its major subdivisions over the period 1950-1964 and gives figures for each European country of OECD in 1963 and 1964. The annex volume deals with statistics for each European country of OECD in the period 1950-1964.

Agriculture and food

AGRICULTURAL AND FOOD STATISTICS

OECD publishes collections of statistics of agriculture and food for the OECD area as a whole and for each of its countries. The range is very wide : agricultural areas, means of production, agricultural employment, livestock numbers, production, prices, foreign trade and food consumption. The figures span a period of ten years or more. These collections provide those interested in the role of agriculture in contemporary economic life with indispensable information.

FOOD CONSUMPTION IN OECD COUNTRIES

This document, designed to be used as a working aid, contains an analysis of the sources of supply (home production, imports or stocks), utilisation (exports, seed, feed, industrial or food use) and consumption (kg. per head and nutritional value) for each main farm product (cereals, meat, etc.) for each OECD country. The 1966 edition gives figures for the past three years. Earlier reports contain data for previous years. It is hoped to publish at the end of 1966 a fuller report giving revised figures for the last ten years.

Science and education

RESOURCES OF SCIENTIFIC AND TECHNICAL PERSONNEL IN THE OECD AREA

A review of higher education and science policy in the United States, which devotes particular attention

to quantitative estimates of the supply, demand and utilisation of highly qualified personnel.

HIGHER EDUCATION AND THE DEMAND FOR SCIENTIFIC MANPOWER

IN THE UNITED STATES

This report of the Third International Survey on the Demand for and Supply of Scientific and Technical Personnel in OECD countries is a major attempt to assemble data and especially to assess supply and demand in the field of scientific and technical manpower.

THE RESIDUAL FACTOR AND ECONOMIC GROWTH

An evaluation of different attempts to measure the contribution of education to economic growth.

ECONOMETRIC MODELS OF EDUCATION

A mathematical planning model for estimating educational needs supported by empirical applications of the model using statistics from Greece, Spain and Turkey. (A further publication in 1966 will present current work in educational model building in OECD countries).

HANDBOOK OF STATISTICAL NEEDS FOR EDUCATIONAL INVESTMENT PLANNING

This handbook summarises the stat-

istical implications of recent developments in educational planning. It will be supplemented in 1967 by the results of experimental data-collection in OECD countries showing the adequacy of existing educational statistics for planning purposes.

Manpower and social affairs

MANPOWER STATISTICS

The basic statistics of population and manpower in the OECD countries

covering the whole post-war period have been assembled in one volume. The latter was compiled in cooperation with the national authorities and contains a great deal of information not available elsewhere in the same detailed and systematic form.

Tourism

TOURISM IN OECD COUNTRIES

The OECD Tourism Committee publishes an annual report on trends in tourism in the OECD Countries and Yugoslavia. This survey contains the Committee's views on the problems arising from the remarkable increase in tourist traffic. The eight thousand statistics published annually in this report illustrate the main aspects of tourist activity and facilitate comparisons between Member countries. The contents include general tables showing the trend of tourism in the previous year (international tourist traffic; receipts and expenditure in foreign currency on account of tourism; international transport; accommodation and tourism facilities, etc.) and tables for each country showing the number of tourist arrivals and nights spent by foreign tourists.

Transport

REPORTS OF THE EUROPEAN CONFERENCE OF MINISTERS OF TRANSPORT

The European Conference of Ministers of Transport (ECMT) publishes an annual report on trends in rail, inland waterway and road transport during the previous year in respect of traffic and investment.

MARITIME TRANSPORT

The Maritime Transport Committee's annual Reports contain statistics of the freight market (dry cargo tramp and voyage charter, tanker and liner indices); the supply of shipping services (world merchant fleet by types and by flags, showing separately OECD Member countries' individual fleets; tonnage laid up, lost and broken up; tonnage under construction, on order and completed in the world's shipyards); and the demand for shipping services (world seaborne trade, seaborne movements of principal commodities, total air and maritime passenger traffic between North America and Europe).

Statistical methodology

The elimination of seasonal fluctuations through the use of computers. Standardised national accounting system.

Notes on the statistical sources of market research in each of the fol-

lowing fields :

- General statistics
- Footwear
- Household appliances
- Machine tools
- Radio sets
- Pharmaceuticals

Statistics on Sources and Uses of Finance.

Quantity and price Indices in National Accounts.

Comparative National Products and Price Levels.



Final Touches before an operating routine.

Further steps in "translation" of statistics

It is not enough to limit the processing of statistics to a simple first transformation of the data. Figures by thousands and millions may have their uses as reference material. But they are obviously not very suitable for immediate analytical purposes—a mass of data in its raw state merely baffles potential users who need appropriately selected and ordered summary data.

After the first stage, therefore, of widening and strengthening the statistical foundation, the reverse process is applied: the available data are sorted, regrouped and combined so that the user may easily find the answers to his problems by consulting only a few, but directly relevant, figures. Thus, whether statistics are for use within the OECD or are to be included in the Organisation's publications, they are so adapted and presented as to provide the most effective working instrument for final users.

The latter are very varied: the economic policy maker does not in general require the same data as the businessman, for instance. Similarly, in the case of an examination of trade between developed and developing countries, stress may be placed on different aspects of the analysis: what are the chances of developing countries increasing their sales to industrialised countries and, in return, of increasing their own imports; what would be the repercussions of a tariff reduction on the import of a certain product from developing countries; which industries should be set up or expanded in which

countries? — and so on. This variation of requirements brings in its train a wide diversity of statistical tables to be prepared and hence of processing methods

Electronic data banks: millions of figures on tape

While the problems presented by an electronic data processing installation involve their own particular difficulties, the fact remains that these machines provide by far the most satisfactory means of processing statistical data. For users' demands to be satisfied readily, the information required must be stored in such a way that the computer can have access to it and reproduce it immediately on request. This has led OECD to undertake the creation of a data bank, in which the statistical material is systematically organised on magnetic tapes.

The resulting tape files contain:

- foreign trade: monthly figures of total trade by country of origin and destination going back to 1957 and quarterly figures of trade by category of goods going back to 1962 (it is planned to add 1960/1961 later);
- current statistics: monthly or quarterly figures since 1955 for 1600 series covering a wide range of economic indicators;
- basic annual statistics: industry, energy, agriculture, aid to developing countries, national accounts and, in the near future, manpower.

This electronic data bank does not necessarily dispense with the need for keeping manual records,

(continued from page 21)

which are sometimes more flexible and simpler; but once it is regularly kept up to date and carefully checked it is of incomparable value in the selection, processing and printing of data needed for analytical studies and the preparation of publications in which large quantities of figures are presented.

From original statistics to analytical measures

The use of computer processing makes it a simple matter systematically to calculate rate of change, totals for groups of countries, percentage distribution, per capita figures and such other analytical measures as facilitate the use of the statistics. The preparation of indices and averages is similarly simplified. The scope of these automatically executed calculations is wide, and expanding steadily. Recent applications have included measurement of market share in foreign trade, movements of unit costs, and the contribution of individual factors to the rise in the cost of living, to mention only a few.

A particularly important field of activity in OECD's data-processing programme is the correction of the principal economic indicators for seasonal variations. About 600 series are presented with the influence of seasonal movements eliminated, thus allowing a more accurate assessment of changing trends. Most of the seasonal co-efficients for this adjustment are calculated by OECD itself, using a processing programme for the computer which was specially created for this purpose. Due account is also taken of seasonal adjustments made by the countries concerned, or by other international organisations. The confrontation of the results obtained using different approaches has led to a greater understanding of the characteristics and qualities of the various methods of making seasonal adjustments at present in use.

Constantly improving publications

To sum up, a complete chain of operations has been built up in OECD. Its starting point is the research in connection with the basic data and the attempt to improve these data and stimulate their collection. Then there is the collection of statistics, their conversion, their stockage in manual or electronic files, followed in turn by the various processing procedures which adapt them for ready analysis by different types of user. Not the least important of these users is the public, which benefits from all this work in the form of the statistical publications issued by OECD. These publications are subject to a continuing process of review, the object being to present certain selections of data in still more coherent and rational form, and so better adapted for analytical purposes.

The most recent review has already been marked by major changes in the presentation of current statistical data. A particular feature of the new system is the replacement of the former "General Statistics" by a monthly publication "Main Eco-

mic Indicators" whose tables and graphs have been designed specifically with the analysis of the current evolution of the economic situations in OECD Member countries in mind. These indicators are completed by a number of regular supplements examining the published data in more detail. At present these supplements cover consumer prices and industrial production. A supplement on business intentions surveys is under preparation.

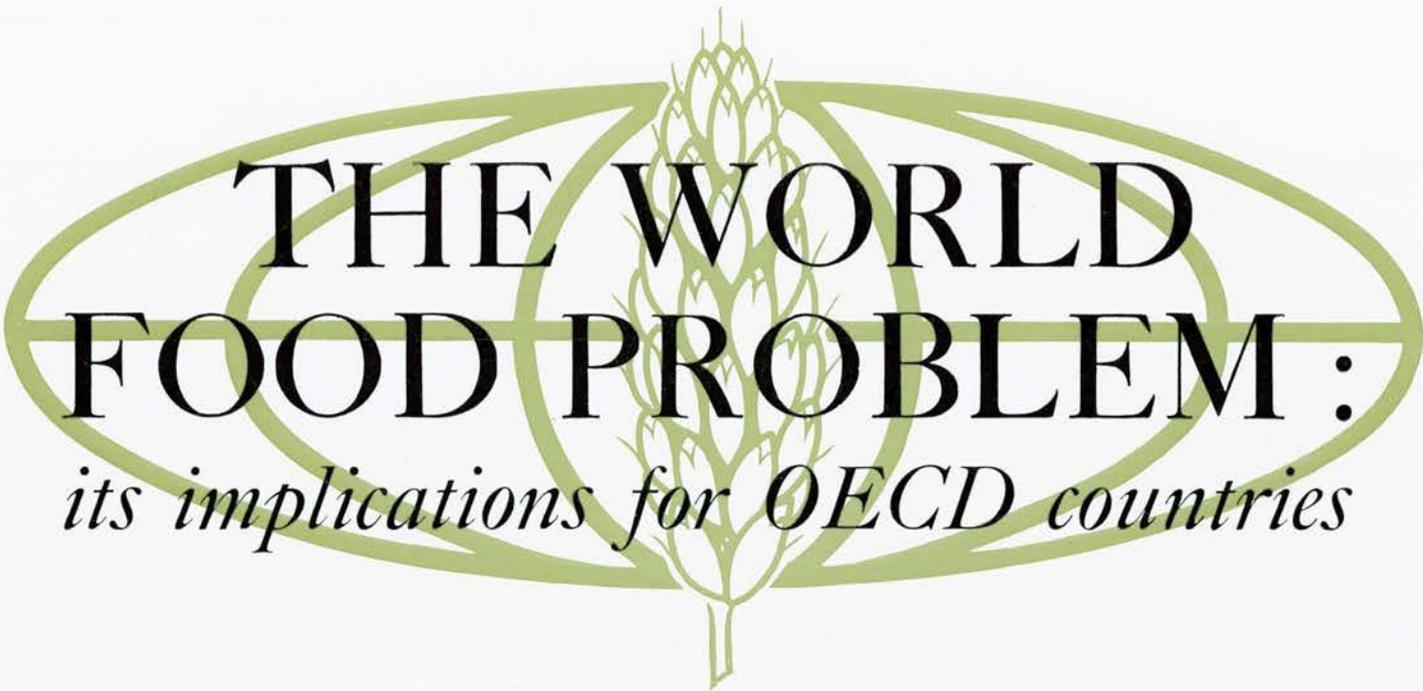
An attempt is being made in the case of basic statistics to present this material compactly but coherently in the form of balance sheets, so as to facilitate analysis. Further progress is evident with the publication of each new yearbook, whose range covers energy, manpower, agriculture and food balance sheets.

Finally, foreign trade statistics are being calculated systematically for selected important groupings of reporting countries — the European Economic Community, the European Free Trade Association, European countries of OECD, and OECD countries as a whole. At the same time the classification of individual countries of origin or destination has been modified to present them in the order consistent with these and other relevant groupings, e.g. developing countries, grouped by continent. Means of improving the analytical character of foreign trade statistical bulletins are being studied.

It is planned shortly to complete the range of publications by producing annual "base-books" for the main economic indicators. These will put the material presently in the electronic data bank at the disposition of the public at large. Historical data of this kind are particularly valuable for the study of economic growth and fluctuations, and these retrospective issues will be indispensable analytical aids. The first base book will give industrial production indices; it will shortly be followed by another covering the principal economic indicators for each country.

The statistician's job does not end with the presentation of more or less fully processed data; there is still the problem of interpreting the material. In this context, the OECD Statistics Division has always had to satisfy a regular demand for analytical studies, some of an econometric nature. Much of this work consists of simple or multiple regression calculations; a major project involving these techniques which was recently completed is reported in "Wages and Labour Mobility" (OECD 1965). Studies of this kind are mainly designed to provide explanations of forecasts of economic events, bringing out, for instance, the conditions under which cost-pressures may effect export performance, or demonstrating the interdependence of the principal economic variables in the different countries — the export forecasts of some being linked with the import forecasts of others, and vice versa.

Statistics, in other words, are becoming more and more linked to analytical work, and the statistician can no longer be content to rest a mere figure collector. In the long run, the result can only be to further the development of the whole process of selecting, gathering, treating and interpreting statistical data, and strengthen still more its contribution to informed economic decision taking.



THE WORLD FOOD PROBLEM:

its implications for OECD countries

The growing concern with the world food situation is shared by OECD. The Development Assistance Committee will consider this matter at its forthcoming High Level meeting of 20th-21st July 1966. This article by Albert Simantov and Michael Tracy, based on work in collaboration with their colleagues of the Agricultural Policies Division of OECD, is a contribution to the better understanding of a problem the solution of which calls for an internationally concerted approach.

PRESENT SITUATION AND RECENT TRENDS

Cause for concern as to the world food situation arises both from the present low levels of nutrition in many regions of the world and from the difficulty in these regions of raising food supplies per head of the population.

The wide disparities in food consumption levels between the developed and the less-developed countries are now well known. As Table A shows, average calorie supplies per person are well below normal requirements in the Far East and slightly below in Africa; though in the Near East and Latin America average supplies appear to be slightly above requirements, the existence of disparities between countries in each of these regions, as well as within countries, means that a large proportion of the populations concerned are getting less than their nutritional requirements.

In addition, malnutrition, arising from excessive dependence on starchy foods and low consumption of animal foods, is widespread in the less-developed countries. In many cases, undernutrition and malnutrition seriously reduce the amount of work which workers in these countries can do. In the developed countries, calorie supplies exceed requirements by a comfortable margin, while the average intake of animal protein, which is less than 10 grams per person per day in the less-developed regions, is about 50 grams in the OECD countries.

Recent information on trends in food supplies per

head in the less-developed regions shows disturbing trends. On the one hand, the growth of food production in the Far East, the Near East and Latin America has been slower in the past five years than in the previous five years: it is only in Africa that there has been some acceleration. On the other hand, the growth of population in these areas appears from recent information to be even faster than had previously been

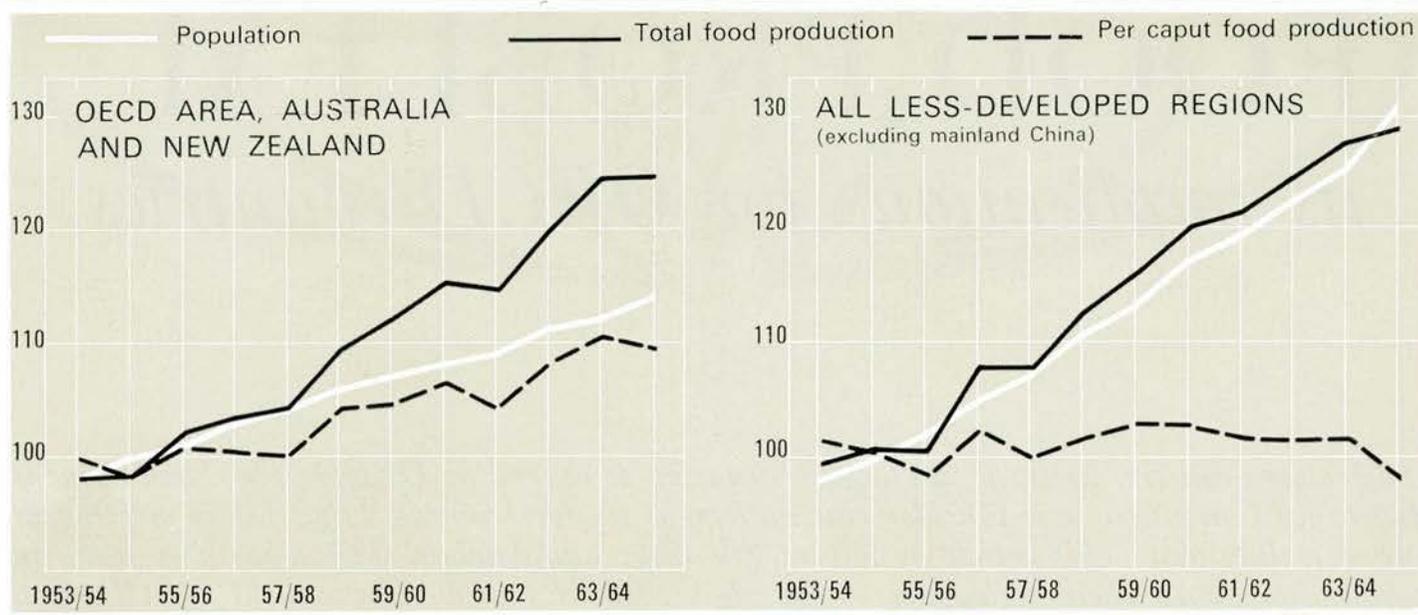
A. CALORIE SUPPLIES AND REQUIREMENTS

(per caput per day at retail level)

	Supplies	Requirements	Supplies as percentage of requirements
Far East	2 050	2 300	90
Near East	2 450	2 400	103
Africa	2 350	2 400	98
Latin America	2 500	2 400	104
All above regions	2 150	2 300	93
All other regions	3 000	2 600	116

Source : FAO, *Third World Food Survey*, 1963

1. RECENT TRENDS IN POPULATION, FOOD PRODUCTION AND PER CAPUT FOOD PRODUCTION (indices 1952/53 - 1956/57 = 100)



thought. The result appears in Diagram 1 : food production per head has *declined* in the less-developed regions, and is below the levels of both pre-war and the early 1950s. In the OECD area, food production has increased at about the same rate but the growth of population has been much slower, so that food supplies per head have steadily increased.

Another recent development has been the reduction of the surplus stocks of agricultural commodities which had previously been accumulated in the OECD countries, particularly in North America. This reduction has occurred since 1961, largely as a result both of purchases by the USSR and China and of increased food aid shipments to less-developed countries. Thus wheat stocks in the US alone amounted in 1961 to over 38 million tons, the equivalent of more than one year's crop in that country, while in 1966 they are expected to be under 17 million tons.

FUTURE TRENDS

Increased food supplies per head in the less-developed regions are essential not only to improve nutritional levels but also to satisfy the rising demand that results from economic growth. With the low levels of income in these regions, a large part of any additional earnings is spent on food. If extra supplies of food are not available from domestic or foreign sources to meet this demand, the result, unless strict rationing and price control are applied, is likely to be increased food prices. This may cause inflationary pressures and adversely affect the whole development of the country.

Future demand trends can be projected by taking specific assumptions concerning the growth of popula-

tion and incomes and by using co-efficients representing the relationship between increased income and demand for food (income elasticities). These can be compared with food production trends.

- *Population trends* have been projected to the year 2000 by the United Nations secretariat (1). Four alternative assumptions are used. One consists of "continued recent trends" : this is the highest, and shows world population rising from 3.0 billion in 1960 to 7.5 billion in 2000 (of which 2.0 and 5.9 billion respectively in the less-developed regions). The other variants — "high", "medium" and "low" allow for some decline in fertility rates and therefore show somewhat lower results by the end of the century. Differences between these variants arise largely from the date at which a reduction in fertility is assumed to begin. For the purpose of this article, the "high" variant has been adopted : this gives a world population of 7.0 billion by 2000 (of which 5.4 billion in the less-developed countries). The possibility of a greater reduction in fertility rates is considered later in this study.

- *Incomes per head* have been assumed to rise at either 3.0 per cent or 1.5 per cent per annum; with population growth of around 2.5 per cent, these rates correspond to growth rates in national income of about 5.5 or 4.0 per cent. The faster rate would be necessary if developing countries generally are to achieve their targets and raise income at about the same rate as the

(1) To be published shortly under the title "World Population Prospects as assessed in 1963". The data used here have been kindly communicated in advance by the UN Secretariat.

2. PROJECTED POPULATION, FOOD DEMAND, FOOD PRODUCTION AND FOOD NEEDS, BY REGION

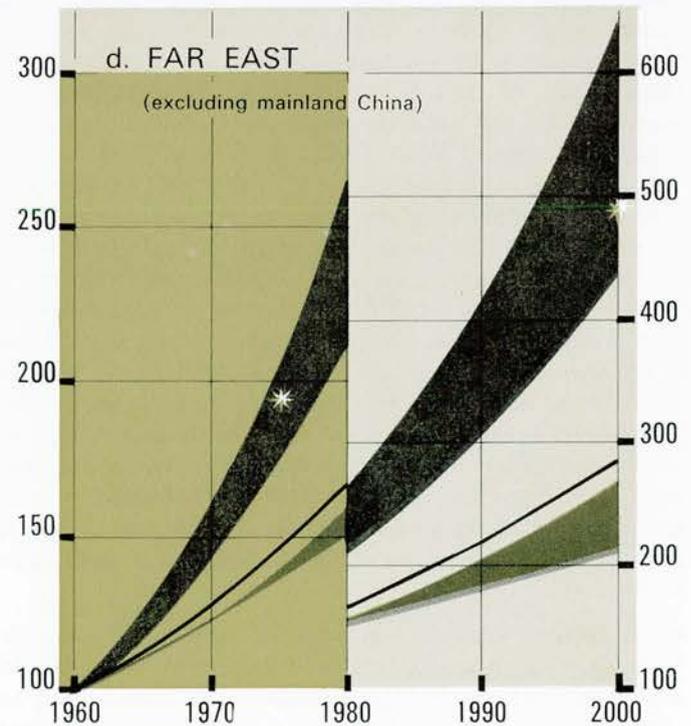
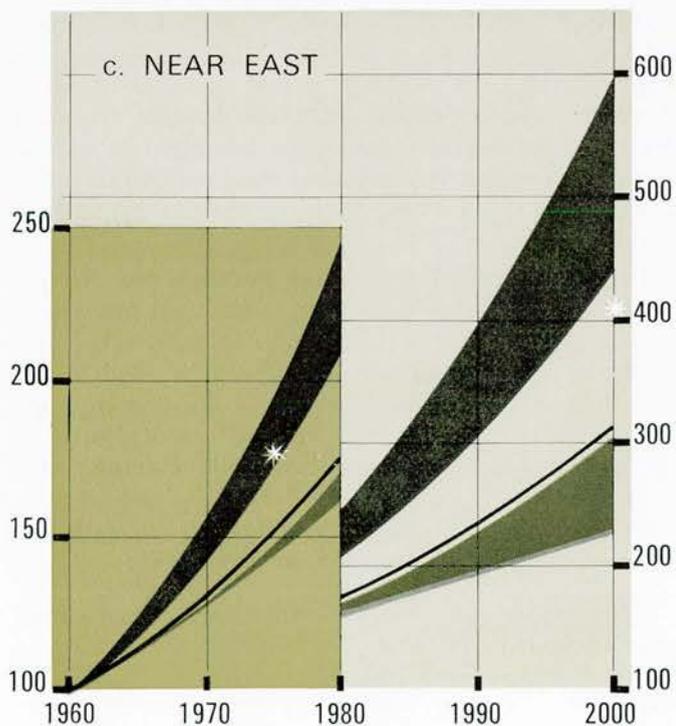
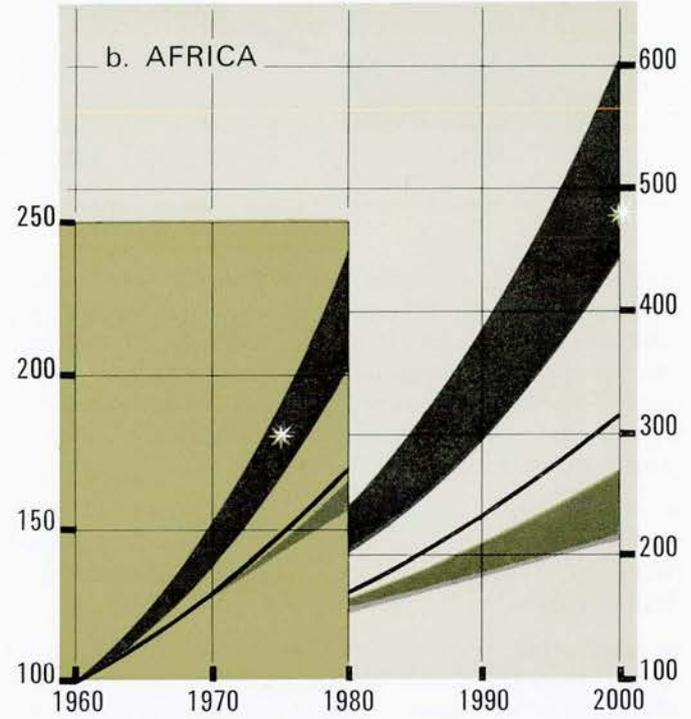
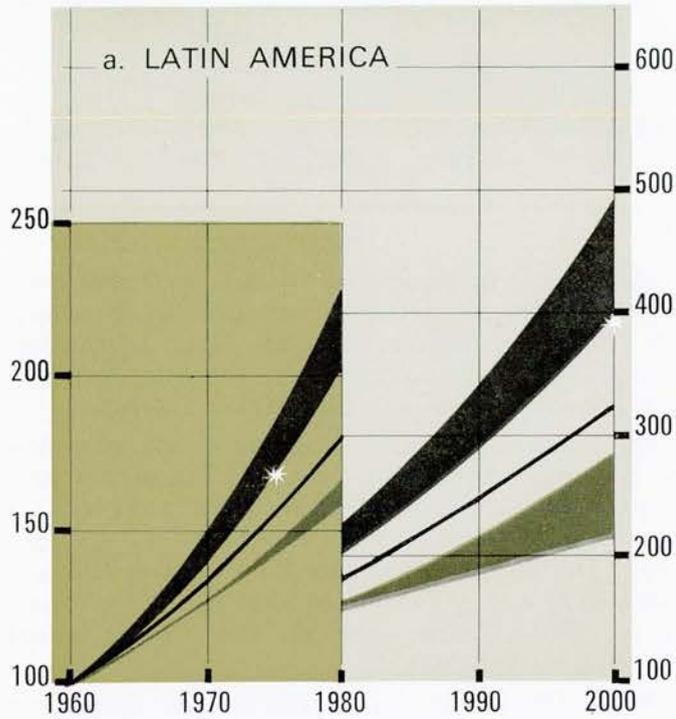
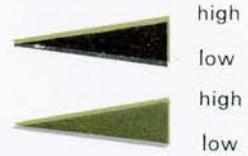
(indices 1960 = 100)

Population

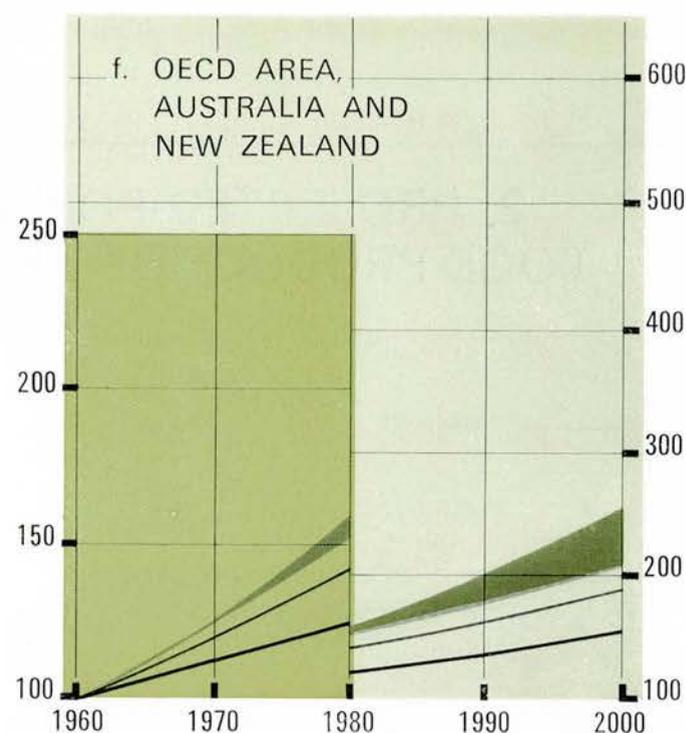
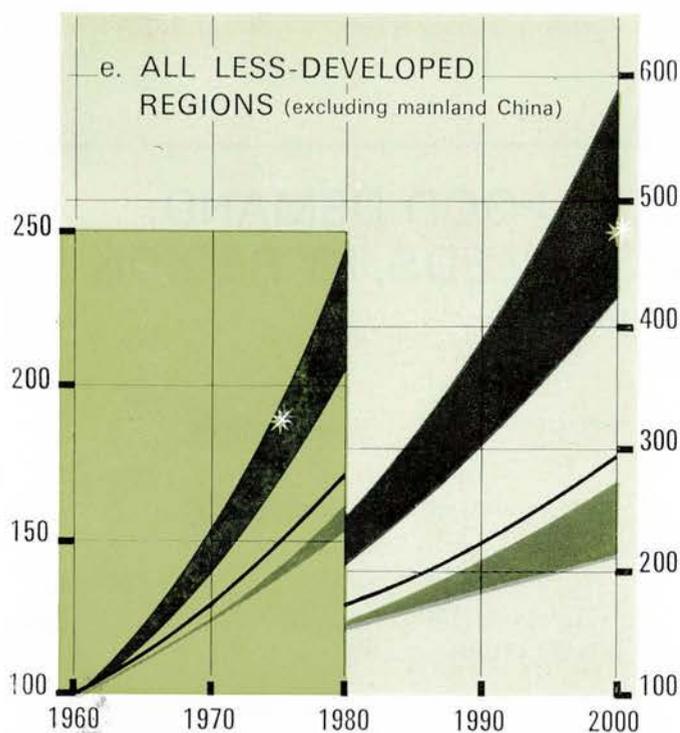
* Food needs

Food demand

Food production



(continued on page 30).



more-developed countries (even this however would probably not lead to any closing of the income gap between the developed and less-developed regions). The lower rate corresponds to a less optimistic assessment. These are however arbitrary assumptions, and later in this article a different assumption for income growth is used.

- *Income elasticities of demand* are based on FAO studies. Relatively high at the beginning of the period, particularly in the Far East, they can be expected to decline somewhat as incomes rise (1).

- *Food production* has been projected by taking for each region the trend of the past five or ten years, whichever is the higher. Except in Africa, this assumption implies some acceleration over trends in the most recent years. A basic question which arises is whether the increase in production is likely to be compound (geometric) or linear (arithmetic). In the case of population, each increase itself provides the basis for future increases. With food production, this is not necessarily so : for production to rise at a compound rate would imply that the effect of diminishing returns is constantly being more than offset by the application of new technology. In fact, trends since the early 1950's provide no evidence in favour of a compound rate : indeed, as has already been observed, they have fallen below the linear trend except in Africa. In this study, production has been projected at both linear and compound rates : either of these therefore represent an improvement over recent trends, and the compound rate is a particularly optimistic hypothesis. Still, neither of them necessarily represents an outside limit, and an even higher production hypothesis is used later in this article.

- A further element consists of *nutritional targets*. These have been worked out by FAO (in its Third World Food Survey) for 1975 and 2000 : they correspond to short-term and long-term targets for raising nutritional

levels to adequate standards. In this study, the FAO targets have been adjusted to take account of the new UN "high" population estimates (some adjustments have also been necessary to make the composition of each region uniform with the other calculations).

On this basis, Diagrams 2a-2d show for each region the projected trends of population, demand and production : for demand and production, the range between the alternative assumptions is represented by a shaded area. The nutritional targets for 1975 and 2000 are indicated by asterisks. To show more clearly the trends up to 1980, different scales are used for the period 1960-80 and 1980-2000.

In all the less-developed regions, and throughout the period up to 2000, the projected growth of food production falls far below both the growth in demand and the nutritional targets (the latter lie within the projected range of demand, except in Latin America where they are just below the lower demand estimate). Moreover, food production, even projected at a compound rate, would rise less fast than population in all these regions — in other words, food supplies per head would *diminish*.

There are certain differences between the regions. In the Far East, in particular, which because of its large population has a predominating influence on the results, projected population growth is slightly less high than in the other regions, but its relatively low average income levels cause demand elasticities to be high and thus lead to a rapid increase in demand, while

(1) The elasticities used are as follows (at beginning and end of period, with a gradual decline in between) :

	beginning	end	
		High income	Low income
Latin America	0.40	0.30	0.35
Africa	0.60	0.50	0.55
Near East	0.60	0.50	0.55
Far East	0.80	0.60	0.70

present low food consumption levels make nutritional targets high in relation to present supplies.

It should also be remembered that there may be important differences as between countries within each region. Thus the "River Plate" countries in Latin America (Argentina, Paraguay, Uruguay) have substantially higher food consumption levels than the rest, and if they were not included in the region, the nutritional targets would have to be set significantly higher in relation to present supplies. The existence of a food surplus in one country does not necessarily mean that another country in the region, which is facing a deficit, can import this surplus, as very often food deficit countries also have balance of payments difficulties. Further, if food requirements cannot be translated into effective demand on the international market, less-developed countries with surplus capacity may be discouraged from increasing production.

Diagrams 2e and 2f make clear the contrasts between trends in the less-developed and those in the developed regions (OECD and Oceania) (1). In the former, population is projected to grow at about 2.7 per cent per annum in the period 1960-80, which is higher than the rates of growth in food production generally achieved in recent years. In the latter, population is projected to grow at about 0.9 per cent per annum; demand elasticities are low so that demand is likely to rise at only about 1.4 per cent (including the effects of both population and income growth), while food production, if the growth of the past ten years is expressed as a compound rate, is growing at about 2.3 per cent per annum (a faster rate of growth would probably have been achieved in the absence of official measures tending to restrain production) (2).

Mainland China, the USSR and Eastern Europe have not been included in these calculations, since insufficient information is available on which to base systematic projections. However China, with its large population, plays an important role in the world food situation. In recent years it has made substantial purchases of grain on the world market. In the UN projections, China's population is projected to grow at a substantially slower rate than that of the rest of the Far East: this presumably takes into account the policies of population control put into effect in China. If food production were to grow at about the same compound rate as that assumed for the rest of the Far East, food supplies per head would rise. However, in view of its present low level of food supplies per head, and of the demand increases which may result from economic growth, China is likely to continue importing food in the near future at least.

The USSR has also made important purchases of grain in the last few years. Food demand and supply in the USSR and Eastern Europe are difficult to project, particularly since the rate of production growth was very much faster in the late 1950's than in subsequent years. If the future rate of growth lies approximately midway between the high and the low rates of recent years, it is possible that food production will

approximately keep pace with demand up to 1970 or 1980, but after that could grow rather faster than demand, providing some potential for exports.

POSSIBLE COURSES OF ACTION

From this analysis of the present situation and future trends, it appears that a serious disequilibrium is likely to persist in the world food situation in the years and even decades to come. In these circumstances, what can be done?

Reducing losses between the production and the consumption stage

There are indications that in some countries at least such losses are considerable — due to animal pests, vermin, inefficiencies in handling, storage, distribution, etc. It appears that in some cases these may amount to as much as a quarter of the crop. An improvement in food supplies could be achieved by action to reduce these losses. Any such improvement could give an early benefit and might be of value in the next decade or two. It would not of course in itself bring about a significantly faster growth in food supplies over the whole period.

Accelerating the growth in production

Production growth has already been projected above on fairly optimistic assumptions, taking the higher rates of growth achieved in recent years and assuming that these will be sustained over the decades to come: projection at a compound rate in particular implies an improvement over past performances.

However, higher rates of production growth have been achieved by some developing countries (3) and could be achieved in others. Faster production growth would require energetic measures to combat numerous obstacles — institutional, social, economic and technical — and would necessitate a large inflow of capital backed by appropriate technical advice. Fisheries as well as agriculture have an important role to play. The efforts of the developing nations themselves would need to be backed by intensified financial and technical aid from the more-developed countries.

(1) For purposes of this study, Turkey is included under the Near East and not under OECD.

(2) The high UN population assumption has been used also for the OECD area and Oceania. Only one assumption for income growth per head has been used — 3 per cent per annum. The demand elasticities in 1960 are 0.1 in North America and Oceania, 0.3 in Western Europe and 0.45 in Japan, and they decline thereafter.

(3) Cf. USDA, Changes in Agriculture in 26 Developing Nations, November 1965.

(continued on page 32).

To what extent is production growth liable to run up against physical limitations imposed by natural resources? On this point, an FAO study, referring to the nutritional targets for the year 2000, observes :

*“ In Latin America and Africa, the physical resources are unquestionably ample, without approaching their full utilisation, to meet the estimated increases required... In the Near East, an increase in production in excess of threefold would push utilisation of resources much closer to the limits set by present technical knowledge than would be the case in either Latin America or Africa... The need for a more than fourfold increase in food production in the Far East definitely raises the question of the adequacy of the*basic physical resources... ”* (1).

Population control

Medical science has been successful in greatly reducing mortality rates in the developing countries, but fertility rates remain at high levels. The result is the population “ explosion ” in these countries. Merely to keep pace with population, food production in all the developing regions together would have to accelerate from its past ten-year rate of about 2.4 per cent per annum to a compound rate of 2.7 per cent in the decades ahead; to meet the FAO nutritional targets it would have to grow at a compound rate of 4.4 per cent in 1960-75 and 3.7 per cent in 1975-2000. These are the figures resulting from the UN “ high ” variant for population growth, which as pointed out above already involves some reduction in fertility rates as compared with present trends.

The task of raising food supplies per head would be immensely facilitated if population growth could be reduced below this projected rate, particularly if such a reduction can begin within the next 5-10 years. This would require energetic action at an early date by the authorities in a substantial number of important developing countries. In this respect too they can be aided by the more-developed nations.

Increased transfers of food from the developed to the less-developed regions

At present, the OECD area, Oceania and South Africa import more foodstuffs from the less-developed regions than they export to them — in 1960 these developed regions had net food imports totalling \$ 1.7 billion from the developing regions (2) (they also had net imports from the USSR, Eastern Europe and China amounting to some \$ 0.5 billion). With increased food aid programmes to developing countries, this situation has already begun to change. To what extent can increased food transfers from the OECD area and Oceania to the less-developed regions help to meet the likely food deficits in the latter?

As seen above, if food production in the developed regions continues to grow at present rates, it would tend to outstrip the growth of demand in these regions. On the alternative assumptions used above, the result could in principle be to give the OECD area and Oceania a net export balance in foodstuffs of nearly \$ 2 billion by 1970, \$ 5-10 billion by 1980 and up to about \$ 40 billion by the end of the century.

In the less-developed regions, if food demand grows only at the rate corresponding to the slower income growth and if food production rises according to the higher projected rate, there would be a food deficit amounting to some \$ 4 billion by 1970, \$ 14 billion by 1980, and \$ 60 billion by the end of the century. These amounts would therefore exceed even the upper levels of the net export balance projected for OECD and Oceania. If food demand in the less-developed regions grows faster, or production less fast, their deficit could be very much greater.

Other factors have to be taken into account. The USSR, Eastern Europe and China have recently become large importers of food from the OECD and Oceania. If this trend continues, the amounts available for export to the developing areas would, with a given level of production in the OECD and Oceania, be correspondingly reduced.

Further, the limitations arising from shipping, port, inland transport and other facilities should not be forgotten. These problems alone would make it most unlikely that within the next few years a reversal of trade balances of the magnitude indicated above could be achieved, and in the more distant future make problematic an expansion of trade sufficient to meet the deficits of the developing regions.

It is necessary also to bear in mind the possible adverse effects of large food transfers on agricultural development in receiving countries. If the availability of food aid causes governments in less-developed countries to give lower priority to agriculture, or if the increased food supplies unduly depress prices and discourage farmers from raising output, the effect would be the opposite of that which is sought.

Finally, how would increased food transfers be financed? The developing countries, with their balance of payments difficulties, are unlikely to be able to buy more than relatively small amounts on commercial terms. To what extent therefore are the more-developed countries willing to finance food transfers? This point becomes particularly important when surplus stocks are being reduced and supplies for food aid will increasingly have to be produced and bought for the purpose. It should be borne in mind that total official aid from the OECD countries to the developing countries has been around \$ 6 billion in recent years

(1) FAO, *Possibilities of Increasing World Food Production*, 1963 (pp. 221-222).

(2) Excluding coffee, cacao and tea.

B. MODIFIED ASSUMPTIONS AND TRENDS FOR THE DEVELOPING REGIONS

	1960 index	1960-1970 % p.a.	1970 index	1970-1980 % p.a.	1980 index	1980-1990 % p.a.	1990-2000 % p.a.	2000 index
Population (low variant)	100	2.5	128	2.35	161	2.0	1.85	236
Personal incomes	100	1.0	110.5	1.5	128	2.2	3.0	213
Food demand	100	3.3	138	3.65	197	3.4	3.8	400
Food production	100	2.5	128	3.0	172	3.5	4.0	360
% billion	Food demand	40.5 ^a	54.7		80			162
	Food production	42.7 ^a	55.9		73			154
	Net exports (+) or net imports (-)	+ 2.2	- 1.2		- 7			- 8

(a) These are rough estimates. The trade figure for 1960 is however comparatively firm.

(of which about a quarter has been food aid, almost entirely under the American P.L. 480 programme).

Food aid programmes, both bilateral and multi-lateral (the latter under the World Food Programme) have proved their usefulness and will no doubt continue to expand. They will be particularly valuable in the years ahead since they help to "buy time" during which agricultural productivity in developing countries can be raised. But they cannot remove the need for effective action in these countries to balance food supply and demand.



No one of these courses alone is likely to solve the food problem of the developing regions. But what are the prospects if various forms of action are combined?

Table B shows the results of a calculation in which the assumptions previously used are modified.

For *population*, the *low* UN assumption is used instead of the high one. This implies a substantially greater and earlier fall in fertility rates, which would only be achieved if energetic measures are applied soon.

For *income growth*, account is taken of the fact that the increase in personal incomes (which is relevant to demand increases) has been much less than the increase in national income per head in the developing countries. The rate of increase chosen for 1960-70 is 1 per cent, which appears consistent with recent trends; the rate rises to 3 per cent towards the end of the century. This implies that during the next few decades at least, the growth of personal incomes will be kept below that of national income per head.

In view of the slower growth of incomes, a relatively small reduction in the *demand elasticities* is allowed for over the period.

A substantially higher rate of growth in *food production* has been allowed for. It is assumed to rise at 2.5 per cent per annum in 1960-70 — this would imply an acceleration in the remaining years of this decade — and would reach 4.0 per cent in 1990-2000. These increases are moreover projected at compound rates. An acceleration in production growth of this magnitude is perhaps not impossible, but is unlikely to be achieved without high priority in development plans for action likely to raise productivity of agriculture.

On these assumptions, with reduced growth of demand and increased growth of production, the food deficit of the developing regions would amount to \$ 1.2 billion by 1970, \$ 7 billion by 1980 and \$ 8 billion by 2000.

From the nutritional point of view, the assumptions of Table B would allow for gradually rising food supplies per head from 1970 on. The lower population growth rate would also reduce the FAO targets for food supplies, to indices of 185 in 1975 and 380 in 2000 (1960 = 100). With the production increases assumed for Table B, net imports to meet these targets would have to be \$ 11 billion in 1975 but only \$ 1 billion by 2000.

Apart from this last figure, these deficits are still very large and would represent a drastic change in the pattern of world food trade. They are however considerably smaller than the deficits arising from the assumptions previously used, and eventually might not be beyond the capacity of the developed countries to satisfy.

Looking at the immediate future, to meet a deficit of \$ 1.2 billion by 1970 would in fact mean an increase in food exports from the developed to the less-developed regions of \$ 3.4 billion above the 1960 level. If such an expansion is to be realised — and the first question is at what pace it can be financed and carried out — it would have important implications for agricultural policies in the developed countries.

ADJUSTMENT TO TECHNOLOGICAL CHANGE WITHIN THE FIRM : One Aspect of an Active Manpower Policy

One of the main concerns of OECD's Manpower and Social Affairs Directorate is to encourage the use of measures which permit employers to introduce technological and other structural changes without endangering the employment status or standard of living of the workers involved.

National governments may help to ease this process by providing unemployment insurance, retraining opportunities and aids to geographical transfer. But in the first instance adjustment should take place at the level of the individual enterprise. A number of specific techniques to promote adjustment have been developed by private firms or through collective bargaining in recent years. To provide a basis for evaluating such practices OECD's Social Affairs Division asked Mr. A.D. Smith to make a survey of several industries in the United Kingdom and the United States; his report will be published shortly under the title "Redundancy Practices in Four Industries".

When a telephone exchange in the United States is to be automated, the move is announced three years ahead of time; after the announcement no new permanent employees are taken on, any need for workers being filled by temporary help. In this way the telephone system avoids massive dismissals of permanent staff, despite a rapidly changing technology.

Use of natural attrition to help ease adjustment to technological and other structural changes is widespread. In some collective agreements it is recognised as the sole means of terminating the employment of redundant workers : one such contract featuring total job security is the February 1965 agreement between the US railroads and unions representing 300,000 non-operating personnel. In this contract, moreover, the rate of attrition is limited to 6 per cent a year for each of the occupations concerned. Such "controlled attrition" is intended to discourage employer practices that might induce high turnover. In exchange for his employment security a worker must be willing to transfer to another job and, if necessary, to relocate.

It has been possible to rely largely on natural attrition to solve redundancy problems in the telephone industry because more than half of the work force consists of women and thus turnover is very high. At the Kaiser Steel Corp. on the other hand, attrition can be counted even though the turnover rate is lower than in the telephone industry because it has on the whole exceeded the rate at which workers are displaced by technological change. In accordance with the terms of its agreement with the Steelworkers' union Kaiser has set up an employment reserve into which workers move when they are made redundant by new processes; if no new jobs open up, the redundancy is considered to be a temporary situation, and the workers may remain on reserve at full pay for up to a year.

The Need for Dismissal

There are, however, many situations in which technology is changing so rapidly that even a high rate of turnover cannot be relied upon to take care of the problem of redundancy. This is particularly true when whole plants or departments are closed down and when demand for a product or service is falling rather than expanding. Thus the need for a massive reduction of the work force in the early 1960's led the British railway industry to abandon a long-standing policy of no dismissals : according to the terms of a contract signed in 1962 only workers employed before 1958 retain their job security; the others are dismissed and are eligible for severance pay.

Severance pay as a means of alleviating hardship is provided for in many other union-management agreements and has recently been implemented on a national scale in the United Kingdom. When dismissal is inevitable, advance notice may also be required as a means of easing its impacts : the US railways clerks, for example, in certain contracts have obtained the right to 90 days notification when computers or other automated equipment are to be installed. Time off with pay to look for a new job and free rail travel are given to UK railways workshop personnel due to be dismissed.

In the American steel, railways and telegraph industries workers made redundant by technological change are given the choice between a lump sum in severance pay, which means terminating the employment relationship, and smaller payments spread out over a period of time. The latter alternative permits a worker to keep his layoff status and thus enables him to retain certain rights including preferential hiring, preservation of seniority and pension status. In the steel industry workers usually opt for layoff, in telegraph for severance pay, the difference possibly reflecting the fact that re-employment seems less likely in the latter industry than in the former.

In circumstances where dismissal proves necessary, it is the public manpower agencies which provide the principal aids to adjustment.

Transfer and Bumping

If, as in certain parts of the textile industry, a worker has become virtually identified with his machine, its replacement will automatically mean his dismissal. But such a situation is exceptional. More often the worker who is dismissed or leaves is not the one directly affected by technological change: in most companies a process of adjustment takes place within the firm: a worker is transferred from one job to another, sometimes bumping other employees with less seniority from their job, sometimes simply filling vacancies that occur elsewhere. The trend is toward broadening the possibilities for such internal transfers, regularising them and defining the rights and obligations of transferred workers.

When there are vacant jobs for which the displaced worker is qualified, near his home, this kind of transfer presents no particular problems; but in actual fact a new job is likely to require different skills, to be at a lower level of compensation or in another part of the country. Thus mechanisms have been evolved to facilitate internal transfers by offering workers the retraining necessary to take another job, by guaranteeing that their wages will not be cut or by helping them to move.

In the British railways workshops, which carry out maintenance and repairs, workers who must transfer are entitled to wage maintenance on a permanent basis. Under the Washington Agreement of 1936, which provided the basic framework for most subsequent redundancy arrangements in the US railroad industry (1) workers who are transferred from one locality to another are entitled to relocation allowances, travel expenses and compensation for losses incurred in the sale of a home. They are also guaranteed against deterioration of their wages for a period of up to five years, a "displacement allowance" being paid to a man who fails to earn as much money in the new job as he did in the old one. Steelworkers in the US are entitled to relocation allowances if required to move more than 50 miles, but there is no provision for maintenance of wages.

Institutional factors may limit the possibilities for internal transfer, as can be seen from the example of the American railways industry where 20 different craft unions deal with a large number of individually owned carriers, with the result that transfers are limited not only as between lines but between occupations. Obstacles to transfer are also to be found within the framework of a single union and a single company.

Efforts are being made to overcome some of these obstacles - in the US steel industry, for example. One of the most troublesome issues in labour relations in this industry has been a matter of seniority units: over the years and as a result of differing local practice they have come to be so narrowly defined in many

steel plants that there has been little possibility for transfer and as a result more layoffs for high seniority men than was considered desirable. As part of the settlement of a 1959 strike a government-appointed commission looked into this problem and recommended a widening of seniority units according to a pattern that was subsequently incorporated into the collective agreements between steel companies and the United Steelworkers. (2)

Willingness to transfer may be made a condition for receiving other benefits of redundancy plans. Such is the case in the British national scheme where workers who refuse to transfer are thereby made ineligible for redundancy pay. But some collective agreements give an option to those who prefer to stay where they are; non-operating personnel of US railroads, for example, who have more than 15 years' service may choose between transfer and severance pay. The experience of the railroads in Britain, however, suggests that the use of such options may require some limitations. Under a 1959 agreement maintenance and repair workers were allowed to choose between transfer and dismissal with severance pay. So many chose the latter that a labour shortage developed, and the railroads had to hire back men who had already received their redundancy pay.

Intra-firm practices such as the above are perhaps only indicative of the total range of possibilities. The OECD Manpower and Social Affairs Directorate is pursuing the study of redundancy practices in other industries and countries (some of their findings will be presented at an automation conference in November) and it is hoped that new imaginative solutions to this growing problem will be unearthed.

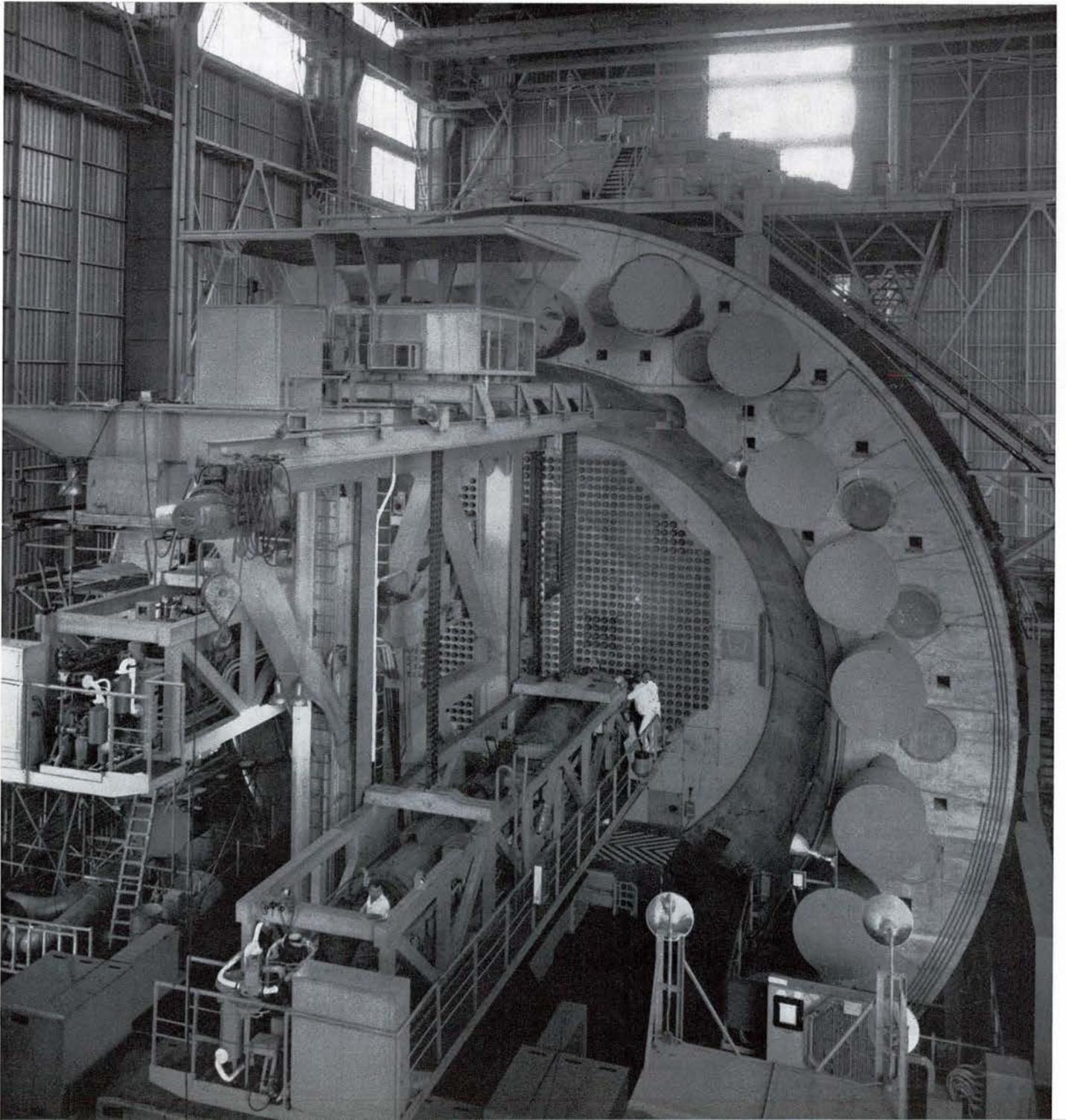
Promotion of an active manpower policy depends upon the close co-ordination of adjustment practices within the enterprise and the facilities provided by the public authorities: the two kinds of programmes can supplement and complement one another. Existence of a system of intra-firm redundancy practices may mean that, instead of having to shoulder the entire burden of helping displaced workers, the public institutions will be able to aid the individual enterprise in implementing its programme, taking over the full responsibility only when necessary.

(1) *The original agreement applied only to workers transferred in the course of consolidation; subsequently the terms of the agreement were widened to apply to workers made redundant for other reasons.*

(2) *Under this agreement, reached in 1962 and amended in 1965, the narrow seniority units are not abandoned: a man who is made redundant can only bump (i.e. take the job of someone with less seniority) within this unit. Under the new system, however, the last man bumped, instead of being dismissed, is moved into an area-wide seniority pool which covers a number of seniority units. He has the right to bump anyone within this pool (provided he can do the work) so that it is the man with the lowest seniority in the entire pool who is dismissed or laid off. In some cases inter-plant transfers are also possible.*

OECD CONVENTION on LIABILITY FOR NUCLEAR DAMAGE

The recent ratifications by France and the United Kingdom of the OECD (Paris) Convention on Third Party Liability in the Field of Nuclear Energy have brought to four the number of ratifications so far deposited with the Secretary-General. Only one more is needed to bring the Convention into force, and other Signatory countries are currently preparing legislation which will enable them to ratify in the near future. This article explains why the OECD Convention was necessary, and how it creates a novel and uniform legal regime designed to solve the complex problems related to compensation for nuclear damage in Western Europe.



THE signature by 16 European countries, in Paris on 29th July 1960, of what was then the OEEC Convention on Third Party Liability in the Field of Nuclear Energy, marked the culmination of efforts begun some years previously to elaborate an internationally acceptable set of rules governing liability and compensation for possible damage, both to persons and to property, resulting from a "nuclear incident". These rules were first developed by an independent expert committee set up by the European Nuclear Energy Agency (ENEA) and drawn from all the sectors concerned: public authorities, electricity producers and distributors, suppliers and manufacturers, insurers, transporters, and scientific experts. Their work led to the adoption of a legal framework whose basic concepts embodied significant departures from traditional legal thinking. In fact, the provisions of the Paris Convention were in many respects so novel that it has since been described as a major landmark in the evolution of international law.

What were these novel provisions, and why were they so regarded? Why indeed was a special convention on nuclear liability necessary, rather than leaving the matter to the normal play of existing laws and regulations? And what difference will the Paris Convention's coming into force make to the practical world of peaceful nuclear development, in particular the expansion of nuclear generating capacity for electric power?

The Problem

The production and use of nuclear energy involves hazards different in both nature and magnitude from those with which the world has long been familiar. Although the safety record of the nuclear industry has been singularly outstanding, thanks to extensive protective measures and careful surveillance, and although the probability of a serious nuclear incident is generally recognised as being extremely small, it would be more than imprudent to deny that such a possibility exists and unrealistic to disregard the potential consequences. An important nuclear incident could have far-reaching effects and, particularly in a closely grouped geographical region like Western Europe, repercussions might be felt in more than one country.

A major problem is that of the availability of adequate financial security to cover potential liability. The scope of the risk is such that providing coverage in the amounts which might be necessary should a serious accident occur has required an important effort by the European insurance market. Through the formation of national insurance pools and collaboration among them an effective marshalling of funds is being achieved, but the establishment of a uniform system of liability throughout Europe is an essential factor of that collaboration.

Furthermore, the complexity of a nuclear installation and the consequent difficulty, in case of accident, of determining the precise original cause, could lead to a lengthy and costly series of legal actions attempting to pass ultimate liability for the damage ever further back along the chain of operators, contractors, equipment suppliers and designers, leaving those who suffer damage enmeshed in legal and technical arguments but denied speedy and adequate compensation.

The core of the nuclear liability problem, in fact, is to decide upon whom, and in what proportions and conditions, should fall the risk of legal liability to persons

who may suffer damage caused by nuclear incident. How much of this risk should be borne by the operator or those associated with the operation of the particular nuclear installation concerned, how much by the individuals who have suffered the damage, and finally to what extent should States intervene to make available public funds for compensation? The solution of the problem involves devising means of harmonising the many interests which must be considered.

On the one hand the public, both for legal and for psychological reasons, must be guaranteed adequate protection in the face of unknown dangers; while on the other hand the continued development of nuclear energy for the common good, and the growth of a healthy nuclear industry, should not be hindered by a burden of legal liability which might conceivably be very heavy indeed in the case of a serious accident, and for which conventional insurance might therefore be unobtainable. A balance of these interests is not easy to attain, especially in view of the multiplicity and variety of existing legal rules and traditions which in many cases must be modified or laid aside if a coherent and unified system is to be established.

The OECD Solution

The traditional way to determine who should pay for damage caused to persons or property is to establish whose fault was at the origin of the damage, irrespective of whether that fault may have been deliberate or the result of negligence. In addition to this classic basis for liability, however, another concept has been gradually developed over a long period of time under which there is a presumption of liability when a person engages in a dangerous activity and as a result damage is caused to third parties. This concept has grown through judicial interpretation and legislative action, both in common law countries and in continental countries, in order to ensure that the public shall receive compensation in situations where a hazard has been created but where it might be difficult or even impossible to demonstrate that any damage caused resulted from fault or negligence. In other words, the very fact that certain activities are carried out creates a hazard which otherwise would not exist and which can cause damage even in the absence of fault.

Because it was recognised that special dangers were involved in the operation of nuclear installations and the transport of nuclear substances, and, moreover, that in view of the new techniques of atomic energy it might prove difficult to establish negligence, the OECD Convention on nuclear liability adopted the principle of absolute liability, without the need to establish fault before payment of compensation. Thus the Convention is based on the simple thesis that whoever operates a nuclear installation is, for that reason alone, liable for any damage which may result from "incidents" occurring during its operation or in the course of carriage of nuclear substances in connection with it. This means, for example, that if the cooling system in a nuclear reactor should develop a fault resulting in release of radioactive material into the atmosphere, as a result of which some foodstuffs stored nearby should become contaminated, the liability for compensating the owner of the foodstuffs would automatically be that of the operator of the reactor, even though he might have been able to prove that there had been no fault or negligence on his part. (*continued on page 38*)

THIRD PARTY LIABILITY IN THE FIELD OF NUCLEAR ENERGY

ENEA COUNTRIES SIGNATORIES OF CONVENTIONS * = ratified	AUSTRIA	BELGIUM	DENMARK	FRANCE	GERMANY	GREECE	ITALY	LUXEMBOURG	NETHERLANDS	NORWAY	PORTUGAL	SPAIN	SWEDEN	SWITZERLAND	TURKEY	UNITED KINGDOM
Paris Convention (1960)	●	●	●	● *	●	●	●	●	●	●	●	● *	●	●	● *	● *
Additional Protocol to Paris Convention (1964)	●	●	●	● *	●	●	●	●	●	●	●	● *	●	●	●	● *
Brussels Supplement- ary Convention to Paris Convention (1963)	●	●	●	● *	●	●	●	●	●	●	●	● *	●	●	●	● *
Additional Protocol to Brussels Supple- mentary Convention (1964)	●	●	●	● *	●	●	●	●	●	●	●	●	●	●	●	● *

Closely connected to this concept of liability without fault is the principle that all liability is channelled onto one person, namely the operator of the installation concerned. If this were not so, in the above case for example, the operator might have been able to claim that the real cause of the trouble was a defective component supplied by a contractor, who might in turn have argued that his component was defective because of faulty workmanship in some sub-component bought from another manufacturer. Consequently, payment of compensation might have been unduly delayed while difficult and complicated legal cross-actions were being settled in order to establish who was legally liable for the damage.

Moreover, in the absence of channeling liability in this way, special insurance would become necessary to cover the liability of all those who might be associated with the operation of a nuclear installation, in addition to the operator himself. It is uncertain, in fact, whether this much insurance would be available and in any case, the result would be increased costs to the nuclear industry and consequently to the public (for example, higher tariffs for electricity produced by nuclear power plants).

At first glance, it might seem unjust not only to place all liability on the operator but to do so even where he is not at fault. However, the end result is both advantageous to the development of the nuclear industry as a whole and to the public because the necessity of cumulative insurance is avoided and, at the same time, procedures for claims are greatly simplified.

The OECD Convention contains, of course, specific

definitions of who is meant by the "operator" of a nuclear installation — also of the terms "nuclear installation", "nuclear incident" and other terms which must in this context be given precise legally-defined meanings. These definitions are given in the early articles of the Convention and are further explained, as are the other provisions of the Convention, in the "Exposé des Motifs" which is the official commentary on the Convention and has been published along with it (1).

It is however clearly not sufficient to specify that the operator of a nuclear installation — and only he — shall be absolutely liable for the consequences of any nuclear incidents in connection with his installation. Unless it is intended to discourage all persons from ever operating nuclear plants, it is also necessary to set some limit to their liability. The OECD Convention sets two such limits, in amount and in time.

The limitation in amount is to a maximum liability of 15 million European Monetary Units of Account (equivalent to US dollars) for any one incident. Although it is, of course, conceivable that a nuclear accident might give rise to damage beyond this value, the limit was chosen with regard for the practical limitations in insurance or equivalent cover which would be available to an operator. It was recognised, however, that measures might be necessary to increase the amount of compensation available, above the limit established, either by direct State intervention or otherwise, and provision was made to this effect. In fact, such action has been taken on an international level, as will be seen below.

A second limitation to the operator's liability is in time, in principle to 10 years from the date of the nuclear incident concerned. This is necessary because, as is well known, bodily injury due to radioactive contamination may not become manifest until some time after the exposure to radiation has actually occurred. On the one hand, it would be extremely onerous if reserves had to be maintained over long periods against outstanding or expired policies for what might be large but, nevertheless, unascertainable amounts of liability. Moreover, the longer the delay the more difficult and uncertain the proof that such delayed damage was, in fact, caused by the nuclear incident. On the other hand, persons whose damage becomes evident only after some delay should not be denied compensation. The time limit is thus a compromise between the interests of those who might suffer damage and the interests of operators and their financial guarantors.

These two limitations of liability, in amount and in time, are coupled in the OECD Convention with an obligation on the operator of a nuclear installation to cover his liability either by insurance or otherwise. A combination of insurance, other financial security and State guarantee is acceptable, and it is for the competent public authority in each State to determine the type and terms of the security which the operator will be required to hold.

Finally, another main provision of the OECD Convention concerns jurisdiction and enforcement of judgments in claims arising under the Convention. It is clearly desirable, having laid down the absolute liability of an operator for an incident involving his nuclear installation, that all actions against this operator — including direct actions against his insurers or other guarantors in connection with the incident — should be dealt with by the same legal tribunal. This simplifies the procedure for claims, greatly expedites their settlement, and is particularly necessary to ensure that the overall limitation of liability is not exceeded. The general rule laid down by the OECD Convention is that one court, that of the place where the nuclear incident occurs, is competent for all claims arising out of the incident, and that the judgments of this court are obligatorily enforceable in all countries party to the Convention.

The foregoing is necessarily an abbreviated and simplified account of the main provisions of the OECD Convention and of the reasons behind these provisions. There are of course many points of detail which have not been discussed, and for which the reader may be referred to the Convention itself or to the many papers and articles about it which have been published (2). Special rules applicable in the case of incidents while nuclear substances are being transported between one nuclear installation and another, for example, are included in the Convention and explained in its "Exposé des Motifs", as are also provisions with regard to certain exclusions from the application of the Convention (a decision relating to the exclusion of small and consequently far less inherently dangerous quantities of nuclear substances was taken by the ENEA Steering Committee in 1964), to damage giving right to compensation, to exonerations, and to other details of the special system.

A last mention should be given to the matter of the amount of compensation specified by the OECD Convention. Many countries, while recognising the practical reasons for the \$ 15 million limit under the Convention, have believed that considerably greater amounts should

be available in case of need. With this in mind, a Supplementary Convention to the Paris Convention was drawn up and signed in Brussels in 1963 by most of the Signatories of the OECD Convention (3). The Supplementary Convention, a remarkable example of international solidarity, ensures that should the compensation provided by the Paris Convention prove insufficient, additional compensation up to a total of \$120 million would be made available through both individual and collective State intervention.

The Future

On 24th July this year it will be six years since the signature of the OECD's Convention, and at first sight it may seem surprising that, assuming the good will and intentions of all concerned, the Convention has not yet come into force. But when the remarkable and novel problems involved are taken into account, together with the fact that this is a "pioneer" Convention forming the basis of all legislation in the same field throughout the world, it is understandable that countries have been obliged to go forward carefully and surely, for they have been laying the foundations of an edifice which must be built to last.

Initially, certain problems had to be solved on an international level and, in particular, the elaboration of the Supplementary Convention. At the same time, discussions were also taking place on a world level which led to the signing of a second Convention — the Vienna Convention on Civil Liability for Nuclear Damage — in 1963. Subsequently, in 1964, Additional Protocols were signed to the Paris and Supplementary Conventions in order to ensure that there would be no conflict of international obligations for Paris Signatories were they to sign the Vienna Convention as well. On the national level, certain of the Paris Signatory countries have recently adopted new laws on third party liability and others are currently preparing legislation to modify existing laws or to establish new rules in complete conformity with the Convention.

It may thus now be expected with reasonable certainty that, by the seventh anniversary of its signature, the Paris Convention will have become a real and living regime, a new landmark in man's endeavour to accompany scientific progress with a fair, humane and practical control of the potential dangers involved and equitable compensation for any damage which may result.

(1) *Convention on Third Party Liability in the Field of Nuclear Energy* (incorporating the provisions of the Additional Protocol of January 1964). Published by OECD-ENEA, 1964.

(2) See for example:
Weinstein, J. L., *Progress in Nuclear Energy, Series X, Law and Administration, Vol. 3, Nuclear Liability*, Pergamon Press, 1962.
Puget, H., *Aspects du Droit de l'Energie Atomique, Tome I (Responsabilité, Assurance, Transport)*, Editions du Centre National de la Recherche Scientifique, Paris, 1965.

Stein, R. M., *Nuclear Liability - Progress in Nuclear Third Party Liability in Western Europe*, Atompraxis, Sept.-Oct., 1965.

(3) *Convention Supplementary to the Paris Convention on Third Party Liability in the Field of Nuclear Energy* (incorporating the provisions of the Additional Protocol of January 1964). Published by OECD-ENEA, 1964. Although no official commentary was made to this Supplementary Convention, a detailed unofficial commentary was published in 1965: Bette, Didier, Fornasier and Stein, *Compensation of Nuclear Damage in Europe*, Brussels, 1965 (available through ENEA).



PRICE SYS

In almost all OECD Member countries, the fishing industry or the government has set up some kind of system to ensure orderly marketing of fish. Although such schemes have been considered necessary, partly because of heavy fluctuations in fish catches, the OECD's Fisheries Committee wished to have a means of reviewing any impact of these measures on international trade so as to be able to judge whether in a particular case they could be considered to interfere with international co-operation or the free development of competition. Thus a factual study was undertaken of the various systems; it will be published shortly under the title "Price Systems in the Fishing Industries".

In all countries with fishing industries there is some kind of marketing structure for selling the catches. But the systems vary widely between the different countries.

Three main factors underlie the necessity of organising the market for fish at the landing stage, playing their role in different ways and consequently leading to different types of action.

The first and best known factor is that few other products are as perishable as fish. This means that speedy operations are called for in handling and selling the catches as soon as they are landed, together with a rapid and simple method for assessing quality. Furthermore, the quantity of fish on offer depends largely upon natural conditions beyond the control of the fishermen. It is therefore necessary to ensure some flexible means of harmonising supply and demand. In many countries, the answer to these specific characteristics of fish is provided by the auction; this is the most usual way of disposing of the catches, especially

TEMS IN THE FISHING INDUSTRY

in countries which are producers as well as important consumers of fish and fishery products.

Another leading factor is that the demand for fish is relatively inelastic, particularly in the short-run. In a number of markets, if no system were in operation for protecting the fishermen, they would run the risk of obtaining very poor returns in the event of landings slightly exceeding the demand. Thus the benefit of a good haul would be swamped by depressed market conditions.

A feature particularly evident in exporting countries — and a number of important producers export a high proportion of their landings — is that the buyers of fish, whether or not they process the raw material, need regular supplies and to be in the position to quote stable export prices.

Although these different factors are valid for all countries, their relative influence is variable and they result in systems which differ widely from one another. A number of possibilities exist: direct sales, free auction, auction with minimum prices, minimum prices without auction, fixed prices varying according to the season and/or the area. Marketing systems may vary within the same country for the different species caught and/or the use to which the fish is to be put, whether it is intended for the wet fish market, or for canning and semi-preserves, salting and drying, deep-freezing and so on.

The systems are usually based on government regulations, and normally the public services are responsible for running them under controls of one type or another. There are nevertheless a few outstanding cases where the industries themselves have organised privately-run minimum price systems.

Recent developments are almost everywhere leading to more complex and more elaborate kinds of market organisations. More numerous species are being taken into control systems, including wider sectors of production. It should nevertheless be emphasised that this trend does not necessarily

mean an increase of impediments to international trade in fishery products. On the contrary, increased organisation is often indispensable in order to meet the requirements of growth in international trade.

Production of fish is international in as much as it comes mostly from common resources exploited on the high seas by all countries and, as has been stated, a very large share of the production of major fishing countries is exported. The individual markets however have definitely national features. Consumers' habits, structure of the production industry as well as of marketing, geographical conditions, and the economic situation in general — all these factors play their role and must be taken into account. This cannot be satisfactorily accomplished except by countries acting separately.

This is not as paradoxical as it might seem when considering the international nature of the product. One main purpose behind the building up of price systems is to avoid excessive fluctuations on domestic markets; only the national authorities and industries have the knowledge and the means required for judging which systems are to be adopted. The details involved are far too complex to allow of their being treated on the international plane.

This explains why the OECD Committee for Fisheries, in a new study of price systems in the fishing industries of Member countries, made only two precise recommendations: to take the necessary steps to abolish landing bans which can be, like other restrictions on imports, serious obstacles to trade, and to avoid exports at reduced prices which result in unfair international competition.

As regards minimum prices, the Committee for Fisheries stated that "it would be too far-reaching and even harmful to recommend that all these prices should be harmonised to some common levels. A number of differences are normal, and many of them are due to geographical natural conditions and contribute to wards equilibrium in the international market for fishery products."

The harmonisation of price systems or price levels which may be felt desirable or which should be made in conformity with the development of economic regional groups must, the Committee felt, be discussed and elaborated by the relevant countries; no recommendation of a general nature could be put forward in this respect. It must nevertheless be kept in mind that no measure should be adopted which would give too favourable a position to the producers of any one country or group of countries.

To be able to appraise particular cases which might be raised in the future, or more generally the overall evolution of the situation, a prerequisite was to make a detailed survey of all the different systems at present operating in the different countries. This has been done in the Report on Price Systems by the Committee for Fisheries.

Another reason must be added to explain the necessity of gathering such information on the structure of the markets. If the situation of the fishing industries were judged by the amount of subsidies or other forms of aid given in many countries, it would be obvious that the profitability of a number of sectors of the industries is questionable. Furthermore some grounds are overfished, others are exploited to a point where danger exists of depleting stocks. One of the solutions adopted by many fishing industries is to develop the production of deep-frozen fish. Instead of national markets (e.g. for wet fish) which were relatively independent of one another, or international markets of a limited scope (e.g. for salted or canned fish), deep-frozen fish products are now directly competing internationally in the same outlets as other foodstuffs. This undoubtedly increases the importance of the international character of the markets for fish and necessitates a better understanding of the structures of national markets. The study of price systems in the fishing industries in OECD Member countries goes some way towards meeting this need.

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