

the **OECD** **OBSERVER**

THE EFFECTS ON INTERNATIONAL TRADE
OF DIFFERENT TAX STRUCTURES RECENT
CHANGES IN SCIENCE POLICY THE OECD
TECHNICAL ASSISTANCE PROGRAMME RE-
DEVELOPMENT OF RURAL PROBLEM AREAS
RESEARCH AND DEVELOPMENT RESOURCES



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High Level Meeting of THE OECD DEVELOPMENT AID COMMITTEE

The sixth annual high-level meeting of the OECD Development Assistance Committee was held at the Château de la Muette, OECD's Paris headquarters, on 19th-20th July 1967. The delegations of the 16 Members of the DAC (1) were headed by ministers or high-level officials responsible in capitals for the direction of aid policy. The IBRD and the IMF were present as observers.

The volume of assistance, financial and technical, was one of the main subjects before the meeting. According to estimates presented to the Committee, after two years of substantial expansion, the net flow of resources, public and private, from DAC Members to developing countries declined in 1966. While there were increases in the volume of net official aid and in disbursements by multilateral agencies, they were not enough to offset a sizeable drop in the flow of private capital. The total flow from DAC Members fell from \$ 10.3 billion in 1965 to approximately \$ 9.9 billion in 1966. A rise of \$ 230 million (3.8 %) in net official assistance was insufficient to offset a drop of more than \$ 600 million in private investment. (See annexed table.)

The Present Aid Situation

The discussion was based on the Annual Report of the Chairman of the Committee, Mr. Willard L. Thorp. The meeting noted that considerable additional assistance could effectively be used, even though political circumstances in some developing countries were not conducive to economic development. The Chairman spoke of the deep disappointment caused by the slow progress made by DAC Members as a whole towards increasing the volume of their aid. The slow growth of the aid flow in recent years indicated that serious efforts would be required to meet real needs. National budgets would have to give adequate priority to aid, if only to ensure that external assistance rises along with continuing increases in national incomes of Member countries. The Chairman particularly stressed the importance of long-term planning in donors' aid programmes. It was time, he

said, to stop "trying to solve 20-year problems with 5-year plans based on 1-year appropriations".

The rise in official assistance over recent years has been largely attributable to the fact that Members with smaller programmes, such as Austria, Canada, Denmark, Japan, the Netherlands and Sweden, have achieved rapid increases in their official aid levels, while the total of assistance provided by the four largest donors — who together make up 84 % of the total net official flow — has shown little change.

Statements made at the high-level meeting and so far in the course of this year's DAC Annual Aid Review make it clear that a number of countries, including Canada, Denmark, France, Germany, the Netherlands and Sweden firmly intend to achieve steady increases in their official assistance programmes over the coming years. In some countries, these intentions are reflected in specific provision for increases in aid expenditures in their medium-term budgetary planning; in some, they take the form of setting a timetable for achieving the UNCTAD aid target of 1 % of national income.

Principally through its Annual Aid Review, the Committee will continue to urge Members to increase further the volume and to improve the quality of their aid, taking into account the problem of burden-sharing among donors. It will also be studying ways of overcoming the difficulties which are experienced in raising the level and effectiveness of aid to meet the requirements of the developing countries and in securing support for aid budgets. The Committee emphasised that it was important to do more to ensure that public opinion was fully informed on the arguments for increasing the aid effort.

Terms and Conditions of Aid

The mounting external indebtedness of the less-developed countries continues to be a cause of serious

(1) Australia, Austria, Belgium, Canada, Denmark, France, Germany, Italy, Japan, Netherlands, Norway, Portugal, Sweden, UK, Commission of the EEC.

concern. Servicing of accumulated debts offsets a growing share of the aid extended. By the end of 1965, the total debts of less-developed countries were close to \$40 billion; in 1966, this debt burden rose faster than in any previous year, adding at least another \$4 billion to the 1965 total.

In 1965, the DAC adopted the first international Recommendation for development loan terms; a number of Members made progress under the Recommendation in 1966 and progress in this field will be kept under continuing review. The average rate of interest in 1966 on the loans of all DAC Members was 3.1 % and the average maturity 23 years, a slight improvement over 1965 and a move towards the target. Grants represent, as in previous years, about 60 % of total commitments.

The DAC is also giving special attention to the problem of export credits, which are also placing a mounting burden on the debt-servicing capacity of certain less-developed countries.

The Committee noted the concern expressed by many countries at the tendency of aid tying to increase. The Committee intends to undertake, in the course of the coming year, a full study of official policies in this field and of the influence of tying on the effectiveness of official aid.

Agriculture and Population

Because of their increased awareness of the gravity of the world food problem, Members reaffirmed their willingness to increase their efforts to provide external financial

and technical support for promoting agricultural production in developing countries. The build-up of fertiliser supplies and other inputs in the less-developed countries — both through imports and production on the spot — and the development of research co-operation at the international, regional and national levels are two specific areas in which DAC Members plan further discussions in the autumn.

In connection with population policies, the Committee noted with interest the decision of several of its Members to supply assistance on request, either directly or through international agencies, to those developing countries where programmes have been introduced or are under consideration by the governments concerned, and decided to keep in touch with progress in this field.

The Private Sector

The contribution to development from the private sector, including both direct investment and export credits — estimated at over \$3.4 billion in 1966 — was nearly one-third of the total flow. Private direct investment in the less-developed countries is of great significance for economic development. Its significance is not only financial; private direct investment transfers experience, management and technology. The Committee agreed to accelerate work on the scale and character of private investment and its effects on the economic development process. It welcomed measures taken by some Members to increase private investment. It also took note of the increasing activity of non-profit voluntary agencies, particularly in the fields of education, agriculture and health.

TOTAL OFFICIAL AND PRIVATE FLOW TO LESS-DEVELOPED COUNTRIES AND MULTILATERAL AGENCIES, 1956-1966

Million U S Dollars

	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966
Australia	••	(44.9)	(52.0)	••	••	••	••	103.6	(124.0)	144.5	136.5
Austria	4.4	-4.8	6.6	-1.3	5.7	20.2	31.0	5.9	21.3	47.3	49.7
Belgium	89.7	36.5	111.9	167.8	182.2	174.5	128.2	184.9	174.7	231.9	182.6
Canada	105.6	131.6	155.1	82.3	144.7	100.9	109.6	130.5	141.8	169.3	263.5
Denmark	4.6	2.1	5.2	(21.2)	37.9	33.3	14.7	(10.5)	31.8	15.2	24.2
France	1,124.1	1,228.7	1,337.4	1,171.7	1,325.1	1,432.3	1,397.2	1,264.6	1,381.5	1,319.9	1,289.8
Germany	417.0	522.5	510.5	806.3	624.6	837.9	650.0	604.5	707.3	726.8	738.2
Italy	133.7	208.6	154.8	149.2	303.3	262.4	394.4	326.1	241.8	270.5	627.5
Japan	122.0	117.0	317.5	193.0	234.4	382.4	287.6	267.3	289.8	485.5	538.8
Netherlands	280.0	145.1	200.5	217.7	250.0	213.7	140.0	134.4	117.6	228.8	255.6
Norway	8.6	9.2	3.1	6.9	10.2	26.9	6.8	21.6	23.0	38.4	17.4
Portugal	••	••	••	••	••	••	••	••	••	30.5	••
Sweden	14.8	25.2	26.7	45.0	46.6	51.9	37.3	53.4	67.2	72.7	106.6
United Kingdom	588.7	960.5	668.2	843.6	858.8	903.6	751.1	725.1	915.9	997.7	973.4
United States	3,236.3	4,099.7	3,685.0	3,276.1	3,818.0	4,546.0	4,355.0	4,579.0	4,770.0	5,499.6	4,613.0
Total DAC Countries	6,166.5	7,528.8	7,235.5	7,046.5	7,937.3	9,100.7	8,417.5	8,462.1	9,068.1	10,278.6	(9,872.3)¹

(1) Total includes Secretariat estimate for Portugal

BORDER TAX ADJUSTMENTS

During the last four years there has been much discussion within and outside the OECD concerning the effects on international trade of the different tax structures and tax systems of Member countries. These effects are determined largely by the border tax adjustment practices at present in existence.

Among the questions provoked are whether some indirect tax systems are more balance-of-trade advantageous than others, whether reliance on consumption rather than income taxes is likely to improve a country's balance-of-trade position and whether changes in domestic taxation may as a result of the border tax adjustment mechanism have devaluation effects, and if so what should be done about it.

This article was written by Mr. Kenneth Messere, Secretary of the Fiscal Committee of OECD.

THE PROBLEMS CREATED BY BORDER TAX ADJUSTMENTS

As export subsidies are disallowed under GATT regulations and tariff barriers are being reduced, either as a result of measures taken by regional groupings such as the EEC or EFTA or as a result of GATT negotiations, attention has become concentrated more on other possible barriers to international trade. In recent years there has been a great deal of discussion on border tax adjustments, which are believed by some to lead to the same devaluation effects as an export subsidy or import duty, even though their avowed purpose is to put exports on the same footing as similar goods produced in other countries on the one hand, and imports on the same footing as home-produced goods on the other.

Arrangements have always been made to ensure that goods exported from one country to another are not subject to the same taxes in both countries, on the one hand, and do not escape taxation altogether, on

the other. Avoidance of double taxation or non-taxation may be broadly effected in two ways : the goods may be subject to the taxes of the exporting country (the so-called country of origin principle) or to the taxes of the importing country (the country of destination principle).

While border tax adjustments may be defined in various ways, it is most convenient for dealing with the problems which they present to regard them as the fiscal adjustments which are necessary to put into effect the destination principle. That is to say they cover both the exemption from tax, or the repayment of tax already paid in the exporting country, and the imposition of taxes corresponding to the internal taxes of the importing country, whether such imposition takes place at the time the goods are imported or subsequently. Under present international practices, which are based on the rules formulated in GATT, indirect taxes on goods themselves, whether known as sales taxes, turnover taxes, value-added taxes, excise taxes or resulting from State monopolies are considered eligible for border tax adjustments while other taxes such as income taxes, profits taxes, payroll taxes, social security and property taxes are not generally regarded as eligible; to put it differently the principle of destination generally

applies to indirect taxes on particular goods while the principle of origin applies to other kinds of taxes.

While the main question remains how far border tax adjustments are neutral in their effects on international trade and how far they favour some countries at the expense of others, further analysis indicates that there are three entirely different kinds of question involved.

- *The technical question* : Do some countries make greater border tax adjustments than others in relation to the domestic tax burden because of the way in which their systems of tax adjustments are operated? This involves the study of the types of indirect tax system in operation, the way in which border tax adjustments operate under each system and the treatment of indirect taxes on capital equipment, auxiliary materials or services used in the production of goods (see below under "taxe occulte").

- *The theoretical question* : Do countries relying for their revenue predominantly on taxes eligible for border tax adjustments have a balance of trade advantage over countries relying to a greater extent on ineligible taxes? This is primarily a question of economic theory centering upon the controversial question of how taxes are shifted into prices.

- *The practical question* : Can changes in border tax adjustments within the existing permitted practices affect competitive trading positions of countries? And, if so, what should be done about it? This further question involves considerations of international trading relations (should existing practices be modified?) international fiscal questions (should tax systems be harmonised?) and international co-operation (what action can be taken to counter any harmful trading effects flowing from changes in border tax adjustments) of a particular country?

THE TECHNICAL QUESTION

Apart from excise taxes, stamp duties and State monopolies which in the main present only minor problems, there are two questions to be resolved in determining whether or not the practical operation of border tax adjustments influences competitive trading positions.

- Are border tax adjustments likely to be greater or less according to which system of indirect taxation is in operation?
- What is the extent of "taxe occulte" in the indirect

tax system and how much of it is eligible for border tax adjustments?

To answer the first of these questions it is necessary to describe briefly the three kinds of indirect tax system in operation, i.e. :

- Single stage or sales tax;
- Multi-stage non-cumulative or value-added tax (TVA);
- Multi-stage cumulative or turnover or cascade tax.

Sales taxes

Taxes are levied sometimes at manufacturer level, sometimes at wholesale level and sometimes at retail level. The normal method of administering these taxes is to register traders who are made responsible for paying the tax. Registered traders may import or buy taxable goods from other registered traders without having to pay the tax, which in most cases becomes due when the goods are sold to an unregistered person. It usually becomes due also if a registered trader uses the goods for his own business, but materials for making goods can usually be bought by manufacturers free of tax.

Value-added Tax (TVA)

The main characteristic of the value-added tax is that, although tax is collected each time an article (or its components) is sold, it is assessed only upon the value that has been added at the particular stage. The sum of the values added at successive stages is equal to the final price of the product, so

that the sum of the tax paid at the different stages will equal the tax which would have been payable if it had been collected instead as a single payment at the final stage. Thus TVA is like a multi-stage tax as regards its methods of collection and like a single-stage tax as regards the amount finally collected.

Cascade Tax

Tax is generally chargeable whenever a sale is made by one firm to another. Rates of tax are generally low but large yields result from this multiple application, by which tax falls not only on the finished products, but also on their constituents at each separate stage of production. Tax enters into cost at each stage as it is charged, so that apart from any variations in rate, the tax element in final prices will vary from one article to another according to the number of stages through which production has passed and the overhead costs and profit margin at each stage. It is not clear for any given class of product what is the tax burden, since this varies according to the number of

times components are bought and sold during the process from a raw material or component to finished product. The significance of this as regards border tax adjustments is that in fixing the amount to be repaid to an exporter or the amount to be charged to an importer to compensate for tax borne on similar products on the home market, it is necessary to base calculations upon an assumed average tax burden for the class of product in question.

Comparison Between Tax Systems

In the light of the above descriptions Table 1 can be constructed to show first how the border adjustment mechanism works for each tax system and secondly the amount of the border tax adjustment under each system. The table is simplified in that it does not deal with the relatively minor question of the varying values on which tax is assessed, nor with the more important problem of "taxe occulte", which is, however, discussed below.

Two conclusions may be drawn from

this table. In the first place, contrary to statements sometimes made in countries with sales taxes, a TVA tax has no advantage over a sales tax from the point of view of increasing border tax adjustments. It is true that under the TVA tax it happens more often than under a sales tax that an exporter pays tax and then has it refunded instead of not paying tax at all, but even under a TVA tax exporters more often than not are exempt from tax rather than paying it and having it repaid. The widespread notion that TVA means larger border tax adjustments than sales taxes is probably due to the fact that existing sales taxes such as the British purchase tax or Swiss sales tax are of less wide coverage and/or lower rate than the French TVA or other contemplated TVA systems, and it may be politically feasible

to extend the scope of a sales tax or to raise the rate only by changing to a TVA tax.

But while an increase in coverage or rates will increase border tax adjustments, this has nothing to do with the mechanism of the tax. On the import side the main difference between a sales tax and a TVA tax is that the TVA tax is paid at the time of importation, while the sales tax, more often than not, is paid subsequently at the time when the goods are sold by a registered trader to an unregistered trader or consumer, but this difference in the mechanism of the border tax adjustment does not affect the amount of the adjustment.

The second conclusion is that the important difference is between the cascade system where the amount of tax rebated on

export or charged on import has to be estimated and other systems where the amount is exactly known. The question then arises whether, in countries operating a cascade tax, export rebates and import surcharges are higher or lower than would be the case if they could be calculated exactly. While the answer to this question varies from country to country, product to product, industry to industry and enterprise to enterprise, it can be said that the border tax adjustments of countries operating cascade systems are more likely to be too low to compensate for the home tax burden than too high.

Among the reasons for coming to this conclusion are first that more of the countries operating cascade systems belong to the European Economic Community and it is

1. BORDER TAX ADJUSTMENT MECHANISM

EXPORTS

	System (and Member countries operating it)	Method of adjustment	Amount refunded
A	Sales tax at manufacturer level (Canada, Japan, United States)	Exporter does not normally pay tax but sometimes tax already paid is refunded.	Usually none, but if so actual tax paid
B	Sales tax at wholesale level (Portugal, Switzerland and United Kingdom)	Exporter does not normally pay tax but sometimes tax already paid is refunded.	Usually none, but if so actual tax paid
C	Sales tax at retail level (Iceland, Ireland, Norway, Sweden)	Exporter does not pay	None
D	TVA tax (France and since July 1967, Denmark)	Exporter does not usually pay tax but often tax already paid is refunded	Actual tax paid
E	Cascade tax (Austria, Belgium, Germany, Italy, Luxembourg, Netherlands, Spain)	Tax already paid by exporter is refunded	Estimated tax paid

IMPORTS

	System	Method of adjustment	Amount charged
A	Sales tax at manufacturer level	Tax normally paid at time of importation but sometimes subsequently	Tax borne on similar domestic products
B	Sales tax at wholesaler level	Tax normally paid subsequently to importation when tax is due on similar domestic products but sometimes paid at importation	— ditto —
C	Sales tax at retail level	— ditto —	— ditto —
D	TVA tax	Tax paid at time of importation	— ditto —
E	Cascade tax	Tax paid at time of importation	Estimated tax borne on similar domestic products

among the tasks of the EEC Commission to ensure that on average border tax adjustments are not too high, and the EEC Commission have, in fact, estimated that in Belgium, the Netherlands and Germany border tax adjustments represent about 60 % to 70 % of the permitted amount (for Luxembourg the percentage is lower and for Italy it is higher); secondly these figures have been confirmed to some extent by Germany's prospective change-over from a cascade to TVA tax, for a 4 % cascade tax is expected to produce the same revenue as a 10 % TVA tax, so that for a consumption tax producing this amount of revenue the appropriate rate of border tax adjustments would be 10 %, whereas under the existing cascade system Germany's border tax adjustments are usually in the region of 6 per cent; thirdly, in calculating the tax paid at previous stages on a class of products to be rebated on export or equalised on import, certain indirect taxes paid on such products or on their components or on the capital equipment, materials or services used in their production are not included in the calculation.

"Taxe occulte"

This third reason leads naturally to the consideration of "taxe occulte" which may be defined as the indirect taxes on capital equipment (e.g. machinery and vehicles), auxiliary materials (e.g. hydrocarbon oils

and packing), or services (e.g. transport and advertising) used in the production of goods. Its significance as regards border tax adjustments is first that there is considerable variation as between countries both in the amount of "taxe occulte" and in the proportion of it subject to border tax adjustments, and secondly that, like a cascade tax, the amount attributable to individual exports or imports cannot be known exactly, so that any rebate or equalisation charge has to be calculated either according to the average rate borne by the class of article exported or imported or according to the average rate paid by the industry manufacturing the exported or imported article.

While the situation varies from country to country, those countries operating cascade systems probably have the highest amount of "taxe occulte", first because the coverage of such systems is generally very wide and secondly because the cascade system results in a proportion of the tax on the capital equipment, auxiliary materials and services being taxed again each time the article produced is sold. A varying proportion of this "taxe occulte" is however rebated on export and imposed on import.

The value-added tax has also a wide coverage but eliminates much "taxe occulte" by a fiscal device known as "financial deductions" under which manufacturers are reimbursed certain "taxe occulte" paid. In France, the only country with much expe-

rience of a value-added tax, such reimbursements do not cover, however, the "taxe occulte" on hydrocarbon oil, on motor vehicles, or on services, so that much remains. Under the value-added tax systems at present in force there has been no border tax adjustment, either on export or import, to take account of "taxe occulte" borne on the home market.

The amount of "taxe occulte" under sales tax is much more variable, since the coverage of sales tax varies considerably. Apart from the British export rebate scheme which provides for border adjustment in respect of "taxe occulte" on exportation, there have been no border adjustments to take account of "taxe occulte" borne on the home market in countries applying sales taxes.

Apart from "taxe occulte" in respect of cascade taxes, value-added taxes and sales taxes, the most important element of "taxe occulte" is probably due to the excise tax on hydrocarbon oil, which is required for transporting goods. The British export rebate scheme takes account of this in computing the rate of export rebate, but otherwise border tax adjustments are not made, either on export or on import, to take account of "taxe occulte" in respect of excise duties.

The variations between Member countries both as regards the amount of "taxe occulte" in the tax system and the treatment of it with regard to border adjustments is summarised in Table 2.

Conclusions on the Technical Question

The foregoing description indicates that it is possible to come to provisional conclusions on the question of whether the amount of border tax adjustment in relation to the indirect tax burden is likely to vary according to the way in which the adjustment system operates. The first conclusion is that overall the border

adjustments of countries operating cascade taxes are likely to be relatively lower than those of countries operating value-added taxes or sales taxes, though they may be higher for particular products or particular industries. The second conclusion is that there is likely to be variation between countries due to variations in the amount of "taxe occulte" caused by the tax structure and variations in the amount of such "taxe occulte" which is adjusted at the border.

THE THEORETICAL QUESTION

It has been argued that countries relying predominantly for their revenue on taxes eligible for border tax adjustments (that is to say indirect taxes on goods) have a balance of trade advantage over other countries, since the effect of border tax adjustments is to make exports cheaper and imports more expensive. It has been generally agreed that the existing system of border tax adjustments would be neutral only if taxes eligible for border adjustments were fully shifted into prices, while ineligible taxes were not shifted at all — that is to say that an increase in an indirect tax on an article would result in an equivalent increase in the price of the goods, while an increase in other taxes would have no effect at all on prices. For if a tax is fully reflected

in the price of a home-produced article it appears justifiable to put an equivalent tax on a similar imported article and not to put a tax on such an article which is to be exported.

If, on the other hand, the tax is not fully reflected in the price of the domestic article, it is arguable that to the extent that the tax is not shifted forward, an import equalisation tax has the effect of an additional customs duty and remission of the tax on exportation has the effect of an export subsidy. Despite this agreement on what would constitute a neutral system, there remain different opinions on whether or not the existing system is neutral.

The Tax Shifting Controversy

The tax shifting controversy has centred on the relative degree of shifting of consumption taxes (which are eligible for border adjustment) on the one hand and profits taxes (which are ineligible for the border tax adjustment) on the other. According to classical theory, consumption taxes are treated as costs and fully reflected in prices. This conclusion has been challenged on the grounds that rising costs result in a fall in demand, and that to maximise total profits the seller will reduce his profit (i.e. bear part of the tax himself) on each individual article in order to prevent the total demand from falling too greatly.

The theoretical argument becomes more and more complicated because various reasons can be adduced for suggesting that such taxes are not fully shifted (e.g. government expenditure on transport, social security benefits, etc. out of revenue derived from the tax help to reduce business costs; the effective tax rate is less than the nominal rate because of tax-evasion, etc.), while other arguments can be suggested for believing that a rise in such taxes may lead to an even greater rise in prices than the rise in tax itself (e.g. the initial influence of an increase in indirect taxes on prices will involve wage increases which will increase costs, which will result in further price increases; sellers tend to take the opportunity of tax increases to put prices up additionally to cover other rising costs).

Further complications arise because shifting will vary from article to article depending upon their elasticity of supply and demand and according to the state of the economic and governments' monetary and pricing policies.

At first sight it might seem that this controversy could be settled by examining the facts. One is after all simply asking in general terms, if an article priced at 10 units is taxed an additional 2 units, will the new price be 11 or 11 1/2 or 12 or 12 1/2? While it is true that further factual enquiries may help to shed light on the question, there still would remain a great deal of interpretation to be done. For while it may be agreed that the object is to compare pre-tax prices with post-tax prices, it is not clear what period should be taken. In the very short term the full effects of the tax change may not have time to make themselves felt (e.g. the seller may begin by trying to pass the total increase to the buyer but later reduce his prices) while, in the longer term, factors totally unconnected or only remotely connected with the tax change may also affect prices.

The above simplified account suggests that the problem of the extent to which prices are affected by changes in consumption taxes is difficult to resolve.

The question of the effect of business profits taxes on prices of goods is even more difficult, for the theoretical arguments in favour of a particular view of the shifting of these taxes are more abstract and the verification of the facts more complicated. Consequently it is not altogether surprising that some writers appear to think that an increase in profits tax will have no effect on the price of the goods produced by the tax-paying companies, while others think that the effect on such prices is even greater than that of an equivalent increase in a consumption tax.

Even those who are of the opinion that consumption taxes are not fully shifted into prices and that profits taxes are appreciably shifted, so that the GATT rules are not entirely logical and their effects not entirely neutral as regards international trade, tend to recognise certain offsetting factors. The first is that while these writers consider that it is primarily countries with a relatively high reliance on profits taxes (e.g. United States) which are placed at a disadvantage by existing border tax adjustment practices, they accept to varying degrees that the same kind of tax shifting argument which they apply to profits tax may also be applied to social security charges (especially that part paid by employers), which are also ineligible for border tax adjustment, and it so happens that countries relying most heavily for their revenue on consumption taxes also have some of the heaviest social security charges (in particular France and Italy).

Secondly, while some countries rely more heavily than others for their revenue on profits taxes, there is not a great deal of difference between relative rates of profits tax between Member countries of the OECD, so that to allow border adjustments to be made in respect of profits taxes — apart from the difficulty in devising a means of calculating them, which is a separate question — would be unlikely to affect greatly competitive positions.

Finally, it has been suggested that any advantage accruing as a result of border tax adjustment practices to countries relying predominantly on consumption taxes may have been largely offset over the years by changes in exchange rates and general price levels.

Conclusion on the Theoretical Question

The theoretical question of whether existing border tax adjustment arrangements favour some countries at the expense of others as a consequence of their different tax structures remains unresolved largely because the question of the extent to which various kinds of tax affect prices of articles also remains unresolved. Consequently it cannot be determined whether a more neutral result could be obtained by some other border

tax adjustment arrangement which either restricted or extended the taxes to which the principle of destination applied.

It is, however, generally considered that even if existing arrangements have some distorting effect on international trade, this is likely to be slight, and it is not generally believed that any alternative border tax adjustment arrangements would effect sufficient improvement in present practices as to warrant the substantial political and practical difficulties that their introduction would cause. Changes in border tax adjustments within the existing arrangements, whether or not resulting from changes in the structure or rates of internal taxation, present an entirely different set of questions however and this leads to the practical question now to be discussed.

THE PRACTICAL QUESTION

The practical problem is what can or should be done about the effects on countries' international trading positions following from changes in border tax adjustments.

It is immediately clear that changes in border tax adjustments unaccompanied by changes in domestic taxation will affect the trading position of a country, since such changes affect the prices of exports and imports without affecting the price of domestic products. Such changes usually occur in practice because countries operating cascade systems on revising their calculations consider that the export rebate or import equalisation tax on particular products is too low to compensate for the home burden. Whether or not this view is justified, exports of the product in question become cheaper and imports more expensive, so that the trading relationship with other countries is affected.

A more important, because more general, example of changes in tax adjustments unaccompanied by changes in domestic taxation, is the possibility of a country deciding to compensate for "taxe occulte" when it has not hitherto done so. In some countries full compensation for such "taxe occulte" would probably amount to something approaching 5 to 10 per cent of the value of certain products. The possibility of an increase of an amount of this magnitude on imports by way of border tax adjustment illustrates the potential importance of the question since it could, for example, nullify some of the tariff reductions negotiated during the Kennedy Round.

In practice, greater consequences to international trade will probably follow from changes in border tax adjustments resulting from changes in domestic tax-

tion. The most important of these are likely to result from the change from the cascade tax to a value-added tax by the countries of the EEC. While it should be emphasised that the change of the EEC countries to a value-added tax is partly to harmonise the indirect tax system of the Six and partly because the cascade system favours integrated enterprises and allows border tax adjustments to be calculated only on an approximate basis, so that the probable devaluation effects of the change will be largely accidental, they may nevertheless be considerable. It has unofficially been estimated, for example, that the proposed change in Germany, which will take effect on 1st January, 1968, may have the effect of a 3 to 4 per cent devaluation of the mark.

Apart from the changes contemplated by ECC countries changes in international trading positions may also occur through the effect of increased border tax adjustments, resulting from a reduction in rates of direct taxes or social security charges combined with an increase in consumption taxes. The effects this time are less clear, however, because they depend upon suppositions about tax shifting discussed above.

Extreme remedies to these probable disturbances in trading positions have been generally considered to be out of place. Fiscal changes may be made to raise revenue, for growth or income distribution or other purposes, and to attempt to restrict fiscal freedom in the interests of maintaining existing border tax adjustments seemed undesirable as well as impractical. Solution by general harmonisation of tax systems of Member countries appears unrealistic at this stage for similar reasons, and as mentioned above, so does the formulation of entirely new border tax adjustment rules to replace those accepted in the GATT.

Work in OECD on this Question

In March 1965 a Working Party of the OECD Council was set up to consider the questions raised by border tax adjustments in the light of a fact-finding report on the subject by the Secretariat and a discussion of the economic rationale of existing border tax adjustment arrangements, by a symposium of economists. Broadly they came to the conclusions outlined above that while it was unclear whether or not existing border tax adjustment arrangements placed countries with certain tax structures at a competitive disadvantage as regards international trade, permitted changes in border tax adjustments could have repercussions on trading positions.

For the reasons indicated above the Working Party did not consider themselves justified in recommending such radical proposals as harmonisation of the tax structures of Member countries or changes in existing

2. SIMPLIFIED ANALYSIS OF TAXE OCCULTE

(Tax on goods and services used in the production of other goods)

Country	Auxiliary materials		Capital equipment		Services	
	Whether taxed	Whether any tax refund for exports and equalisation tax on imports	Whether taxed	Whether any tax refund for exports and equalisation tax on imports	Whether taxed	Whether any tax refund for exports and equalisation tax on imports
AUSTRIA	○	●	○	●	○	●
BELGIUM	○	●	○	■	○	■
CANADA (Federal)	●	■	●	■	○	■
FRANCE	● ¹	■	● ¹	■	● ¹	■
GERMANY	○	●	○	●	○	●
ICELAND	○	■	○	■	○	■
IRELAND	□ ²	■	□ ²	■	□ ²	■
ITALY	○	●	○	●	○	●
JAPAN	□	■	■		■	
LUXEMBOURG	○	▲ ³	○	▲ ³	○	▲ ³
NETHERLANDS	○	●	○	■	○	■
NORWAY	□	■	○	■	●	■
PORTUGAL	■		■		■	
SWEDEN	●	■	○	■	○	■
SWITZERLAND	●	■	○	■	■	
UNITED KINGDOM	□	▲	□	▲	■	
UNITED STATES (Federal)	□	■	□	■	■	

● yes
○ usually
● sometimes

■ no
□ rarely
■ never

▲ only for exports

1. Taxable ; but with certain exceptions tax is subsequently deducted.
2. Normally taxed ; but tax is not paid when used by registered traders.
3. There is a small refund to cover tax previously borne, which may cover in part "taxe occulte".

border tax adjustment practices, but they agreed that a country should have the right to request consultation when it considered that its trade interests were affected as a result of a change or proposed change in the border tax adjustments of another Member country. The Working Party accordingly recommended that a consultation procedure be established for an experimental period of two years.

While recognising that the question of consultation before a change was put into effect could raise political and constitutional difficulties, the Working Party considered that such prior consultation should take place whenever possible, so that the views of governments who felt that they would be adversely affected by the proposed change could be fully taken into account

by the government proposing the change. It was agreed that such consultation should be confined to the general policy implications concerning the international trade and payments effects of changes in border tax adjustments and that the domestic reasons for changes in taxation should be outside the scope of the consultation procedure.

The Working Party also recommended that all important changes in border tax adjustments should be notified to OECD as soon as they were made known to the public of the country concerned and that the Secretariat should bring up-to-date their 1964 fact-finding report. These recommendations were endorsed by the Fiscal Committee and Trade Committee of OECD and adopted by the Council on 21st February, 1967.

PROGRESS IN SCIENCE POLICY

The Scientific Affairs Directorate of OECD recently organised an experimental seminar on science policy, the main purpose of which was to provide material from a number of experienced people in this field and to make possible an exchange of views on the application of science to the formulation and implementation of public policy between administrators concerned with such policy and academic research groups. The seminar formed part of the follow-up to meetings of Science Ministers of OECD countries which have taken place at OECD headquarters during the last three years.

The discussions centred round a number of broad themes : science and public policy ; science and the economy ; fundamental research and applied research and development ; allocation of resources ; and international scientific relations. In this article Jean-Jacques Salomon, Head of the OECD Science Policy and Resources Division, comments on these themes and the treatment of them at the seminar, an account of which will be published shortly under the title " Problems of Science Policy ". References are made in the text to the identity of the particular members of this outstanding group of guest speakers whose views they represent.

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A trend from general to particular questions, from theory to concrete experience, and from the stage of institutional recommendations to that of daily practice marks the direction of shift in science policy over these past three years. A few brief illustrations of these changes may be given as they emerge from the statements and discussions at the seminar. Changes have taken place at three levels : that of concepts, content, and the practice of science policy.

So far as the *concepts* are concerned the traditional distinction made between fundamental research and applied research, in the sense of their being two estranged if not actually hostile blood brothers standing with their backs to each other, is one which can no longer be sustained. The essential feature of research can be considered to be the institutional environment in which it is conducted rather than whether or not it is applied. The institutional framework is what determines the character of research, and accordingly how it can be conceived, managed, administered and oriented — hence how it can be planned. Science planning, insofar as it exists, is patterned according to the major goals of institutions engaged in some particular type of research. No meaningful distinction can be made in terms of disciplines or even programmes ; it is the institutional category which fundamentally defines the kind of research project, whether it is " mission-oriented ", indirectly referred to such a target, or is conducted in an academic setting and devoid of any immediately apparent utilitarian character.

A second instance of change is that affecting the very objectives of science policy. As recently as three years ago the context of such objectives was still extremely vague. While it was recognised that science policy should form a part of overall government policy, whether for reasons of discretion or simply because the subject had not yet been thoroughly explored, no attempt was made to determine a hierarchy of objectives — a hierarchy which exists and must be taken into account for a proper understanding of the allocation of resources and the consequent assignment of priorities. Today, largely because of the efforts made to improve the systematic collection of statistics on the deployment of scientific manpower (for which OECD must be given its due) the relative importance of scientific and technological research efforts made by the various countries can begin to be more correctly appraised, and a closer idea gained of the major decisions responsible for such efforts. The objectives can be ranked within a system which, for whatever it may be worth, at least reflects reality.

The options in science policy can be classified according to military, then prestige, economic and welfare considerations, ending with the objective of " science for its own sake " (1). Or the objectives can be reduced to three (2) : political (including defence and prestige considerations), economic and social. This sort of classification is highly significant, since it shows the actual

(1) C. Freeman.

(2) J. Spaey.

Guest Speakers at the Experimental Working Session on Science Policy



Lord BOWDEN,

Principal,
The University of Manchester Institute of Science and Techno-
logy
(formerly Minister of State, Department of Education and
Science).



Harvey BROOKS,

Dean, Division of Engineering and Applied Physics, Harvard
University,
Member of the President's Science Advisory Council,
Chairman of the Committee on Science and Public Policy
(National Academy of Science).



Maurice PONTE,

Member of the Academy of Sciences, Paris;
Chairman and Director General of
" Compagnie Générale de Télégraphie Sans Fil "



J. SPAEY,

Secretary General, National Council for Science Policy,
Chairman of the Interministerial Committee on Science Policy,
Belgium.

political, strategic, diplomatic and economic background against which scientific and technical research policy is formulated and implemented by the decision-makers.

Yet, apparent in most countries today is what may be termed a "second-generation" science policy, which tends to alter the order. The "first era" of science policy was one of dealing with emergencies, responding to outside pressures, and meeting the challenges of the war and post-war period. To what precise extent the responses to such external situations were finally formulated as a policy is hard to say. Today, however, as the potential applications of technological and scientific research to economic growth increasingly come to light, consideration can be given to measures more deliberately orienting research towards civilian goals, and to defining a policy which does not merely deal with *whatever is left over* once such priorities as defence, nuclear and space research have been accounted for, but is concerned to develop what is left by allocating resources less dependent on combined strategic and diplomatic requirements.

The challenge consists in formulating a science policy to promote the innovation process, starting at the source — that is with research proper, whether fundamental or applied — and ending with the returns ultimately yielded by the production system. Indications of such a trend can be seen in the importance now attached by European governments to technological growth, and in the allocation of greater resources by the United States to research intended to build its "Great Society".

The Content of Science Policy

As far as the *content* of science policy is concerned, the attitude in 1963 was that the function of such policy must be to support both research *and* the utilisation of its findings; policy *for* science being distinguished from a policy *by the use of* science. This distinction now appears to have evolved — while the primary governmental responsibility must still of course be to support the growth of research, apart from the non-oriented fraction of university research, the two objectives cannot now be dissociated. No longer is there a policy for science on one side and a policy by the use of science on the other; both aims are closely linked from the start.

It may at the same time be noted that this way of making science policy a part of the more general policy framework has given rise to a preoccupation scarcely taken into account three years ago, which is that research policy must be linked to "value" decisions. Science policy entails a number of possible alternatives, and a choice of possible goals. No other area of policy would seem to have greater implications for the future, since by definition scientific research can shape the very environment of the social, economic and political world of tomorrow, and, especially, it retains, regardless of the degree of planning possible, such a conjectural character that a decision taken today may have totally unexpected implications in the longer term.

On this score, if the order of the major choices appears to require modifications, is this not also because of the increasing concern for the long-term repercussions of the "scientific revolution"? Here it is not a question of

"output" measured in terms of returns, but of the human and social implications of scientific and technological progress.

To continue with the subject of content — the long-standing argument, as to the status of science in society, which was a particular feature of English writing before the last world war, is now completely superseded. The problem is not whether science should be regarded as an autonomous enterprise, as a world apart in the cultural system, as a consumer good among others or as a luxury occupation (1). Actually, whether voluntarily or not, science enables the goals of society to be attained. It is a fact that the advances of science and research are dependent on ever increasing investment, and both government and society are accordingly anxious that it should yield some return. Science may be defined as one of several institutions which, directly or indirectly, probabilistically or deterministically, serve the conscious or unconscious, the avowed or hidden objectives of society as a whole. Invariably it performs a social function which bars its emergence as a system independent from others

Science Policy in Practice

Finally, it is at the *technical* level that changes have become most evident. All that has been said about the instruments of science policy is tantamount to saying that the evolution of scientific research can be planned in a policy context. Less than three years ago the thought that any kind of planning could be applied to scientific research seemed as unorthodox as the idea of economic planning prior to the Second World War. The functions of scientific research (1), the subject of technological forecasting, the economic concerns underlying science policy, and the problems of size, structure and organisation (2) — all show that research planning is not only possible but inevitable.

Lectures and discussions both showed it necessary to distinguish between two forms of planning. There is first (3) the fact that science policy is part of the wider context of overall policy, particularly economic policy. In this sense, a form of research planning exists which is but one component of the general economic planning process. To this, however, must be added another type of planning, possibly the most novel and sophisticated in use today, which determines the very fate of scientific activities according to the orientation of a particular society or country : planning entails forecasting. The process is not one of centralised decision-making vertically from the top down, nor of determining medium-term objectives subject to constraints where resources are concerned, but rather consists in analysing possible directions, the alternatives which are open, and the capacity to develop several choices simultaneously. This seems the proper setting of technological forecasting, an art which, even though the instruments have not yet been perfected, shows that it is possible to prepare for the future, taking into account the problematical character of scientific and technological research.

The subjects discussed at the session all fall within this context of the changing problems of science policy. Among these at least three themes can be singled out as

having in some way been referred to if not explicitly developed in each paper :

- technical innovation and relations between government and industry;
- international scientific relations and co-operation;
- disparities between national research and development efforts.

These three themes are in fact closely interrelated. Governments are particularly concerned to promote the growth of technological innovation, since it is by this process that science and technology can most directly affect economic development. The key to this development is ever closer links between government, industry and the universities. But technological innovation is not only governed by factors of scale (4), such as the degree of investment, size of firms, dimensions of the market, etc ; it also depends on how the research system is integrated with the general economic system : the stage during which findings are exploited continuing the phase of discovery and invention.

Capacity for Development

What seems most to distinguish European industry from American industry is a lesser capacity for development, neither management nor marketing aspects being integrated to an equivalent extent in the innovation process. Yet questions of scale do play an important part, as evidenced by the increase in co-operative projects, in which efforts are pooled to strengthen those undertaken at national level — although, there is little justification for the manifest lack of co-ordination in their development. From this standpoint, international scientific relations bear all the marks of a competitive as well as co-operative system. In Europe problems of choice are thus associated with solutions of a political nature, designed to improve national competitiveness, which ultimately means making up for the lags, inadaptation and shortcomings apparently responsible for what has been termed the "technological gap".

At the international level two types of disparity in scientific and technological research potential may be noted. One is what has been called the "research desert", a feature which marks the underdeveloped or developing countries in contrast to the "affluent societies", and the other, the disparities which exist between even the most highly industrialised countries.

While each and every country — however much it may lag behind and however small its growth rate — ultimately can be regarded as competing in the same race towards economic development, it is harder to conceive of all the countries setting off or catching up in the science race. Time is an essential factor (5), since a country's scientific potential is primarily measured in terms of generations of

(1) H. Brooks.

(2) C. Freeman and M. Ponte.

(3) J. Spaey.

(4) C. Freeman.

(5) Lord Bowden.

students, teachers and research workers. From this aspect, any view of the enormous global investment in research and development activities during the past bare quarter of a century in no way minimises the discrepancies in the distribution of scientific effort between countries, and especially the obstacles standing in the way of policies to overcome them. Since so few opportunities exist for research scientists trained in the developing countries, the temptation to emigrate to the wealthier countries is great. But the brain drain does not stop at Europe, and must be regarded as part of a vaster movement, with Europe ultimately playing the part of a staging-post.

Notwithstanding the universality of science, from the standpoint of the concentration of scientific effort and resources, mankind is bound to be ever more divided. This is crystal-clear in the case of the non-industrialised countries, which are precisely those in direct need of the contribution which science and technology can make towards their economic and social development. The scientific and technical growth of a society, however, has little parallel with its social and political growth — so little in fact that the line dividing the industrialised and underdeveloped societies appears increasingly to be the capacity to turn to advantage and especially carry through the "scientific revolution", rather than an institutional one.

Industrial societies are usually defined in terms of the most evident characteristics of technological progress whether these are the consequence of or conditional for technological progress : industrialisation, urbanisation, reduction of the agricultural labour force, expansion of the tertiary sector, etc. All such features can be expressed in quantitative terms, but their measurement does not throw light on the real issue : all are complementary and interconnected, and that it should be necessary to leave the list open by an "etc." is proof enough that greater significance cannot be ascribed to one rather than another.

If only those factors whose quantitative expression denotes increased production are used, the line dividing the developed, developing and, even more, the underdeveloped countries is anything but sharp and almost contradictory : the characteristics of growth are found everywhere — in Asia, Africa, Europe or the United States. The difference would only be one of degree — whether of size, extent, rate or intensity, as one pleases. But the difference is not one of a plus or minus quantity alone; nor will the mere transfer of technical or economic institutions ever suffice to correct it. The greatest gap is here and is one which constantly widens as the industrialised countries forge ever farther ahead.

The pace of scientific and technical progress tends to create disparities even in those areas which may be regarded as the most advanced in the world. In one sense, what is true of less developed societies is also true of the advanced countries, or, more accurately, is becoming more so as scientific activities impinge ever more heavily on world affairs. Not all industrial societies are equally productive of scientific knowledge and technological innovations. On the contrary, the already appreciable differences which mark research capacity among the most highly industrialised countries are constantly increasing, primarily on account of the speed of progress, but also owing to the resources in manpower, equipment and capital on which such progress depends.

It is here that the difference between the industrial

revolution and the contemporary scientific revolution is most strikingly apparent. Whereas in the former national frontiers could be more easily disregarded than geographical constraints, in the latter the reverse is true. The industrial revolution grew with the dissemination of technical processes whose large-scale use depended on the proximity of raw materials and a fund of unskilled labour. The scientific revolution spreads only to those areas which already possess, rather than natural resources, the economic structures and the teachers, scientists and engineers capable of applying and developing specialised knowledge. The proximity of a good university is a more decisive factor in siting a science-based industry than access to raw materials, just as at national level technological capability is more important than the capacity to acquire patents.

This new type of economy, whose source of wealth and power lies not only in rationalising work but in organising discovery, is a harder pattern to universalise than the industrialisation pattern. It is from this aspect that science policy is probably farthest removed from economic policy, with which it is often compared : the components are too dissimilar, the resources required too varied for any international equilibrium to be established. Such commodities as raw materials, manufactured goods and currency can serve as a common yardstick, but there is no standard measure for products and processes which only have a potential existence, and which are unattainable unless it is possible to afford the risk of carrying out research which may prove unsuccessful or yield results which have already become available elsewhere.

Each European country has, in its turn, been able to accomplish its industrial revolution on the English pattern, but no European nation is capable, by itself, of carrying through its scientific revolution on the scale of the American or Russian prototype.

The thermonuclear duopoly is also a scientific duopoly : only the United States and USSR are at present capable of mobilising their science potential at the same rate, on the same scale and in all the pioneering sectors, whilst devoting at least a tenth part of this capacity to pure research — representing an amount no smaller, and sometimes greater, than the total gross expenditure on research and development of such countries as France, Germany and the United Kingdom.

How can the capacity for innovation and hence competitiveness of the medium-sized countries be preserved and improved? Were the countries in our industrialised society to be classified as "followers" and "leaders", the dependence of the first group on the second would in the long term cause no fewer difficulties than dependence by the underdeveloped countries on their "affluent" partners. Science policy can thus be said to lie at the core of the greatest problems now facing modern states — for in a specific sense it will determine their relative positions of power, and in a more general sense, the shape they want their own future to take in the context of the "scientific revolution".

That research on these matters should be developed is of the utmost importance. The agencies which administer science policy will need to make increasing use of studies undertaken by specialists — and such specialists must be trained. A further important point is that the study of these problems must not remain the monopoly of administrators if the pitfall of "expertocracy", frequently mentioned during the course of the seminar, is to be avoided.

DEVELOPMENT OF RURAL PROBLEM REGIONS

Depressed rural areas have been receiving increasing attention by governments of the OECD Member countries and there is now general acceptance of the fact that without special measures and programmes the conditions of these regions are not likely to improve. Work on rural areas' development undertaken for the OECD Committee for Agriculture began in 1962, when an Expert Meeting on "Programmes for Mountain Regions" was held (1). It was followed in 1963 by a European / North American Working Seminar on "Regional Rural Development Programmes" (2) and in 1964 by an expert study concerning possibilities for non-agricultural development in rural areas (3).

Under the 1965 programme of work five monographs on the preparation and practical execution of development policies and programmes in selected problem regions of their countries were prepared by country rapporteurs from France, Germany, Sweden, Switzerland and the United States (4) which in 1967 are being continued by corresponding investigations in Italy and Spain (5). Some conclusions from the work undertaken so far are given in the following article, contributed by Engelbert Tacke of the OECD Agriculture Directorate.

(1) "Development of Improved Methods for the Preparation, Execution and Evaluation of Programmes for Mountain Regions".

(2) "Regional Rural Development Programmes with Special Emphasis on Depressed Agricultural Areas including Mountain Regions"; OECD Documentation in Agriculture and Food No 66, Paris, 1964.

(3) "Policies and Programmes for Non-Agricultural Development in Rural Areas" (Working Document).

(4) "Policies and Programmes for Rural Areas Development - Comparative Analysis of Selected Rural Areas". Vol. I: "The Cantons of Mauron and Guéméné-Penfao in the Inland Brittany Region of France"; Vol. II: "The Wiedau-Bongsiesl Region in the 'Programme Nord' Area of the Federal Republic of Germany"; Vol. III: "The Kalix Region in the Northern Development Area of Sweden"; Vol. IV: "The Mountain Village of Bruson in the Canton of Valais in Switzerland"; Vol. V: "The Ozarks Region of North-Central Arkansas in the United States".

(5) The monographs will concern the Marsica region in the Abruzzi mountains, Italy, and the Penaranda region in the province of Salamanca, Spain.

Nature and Causes of Problems

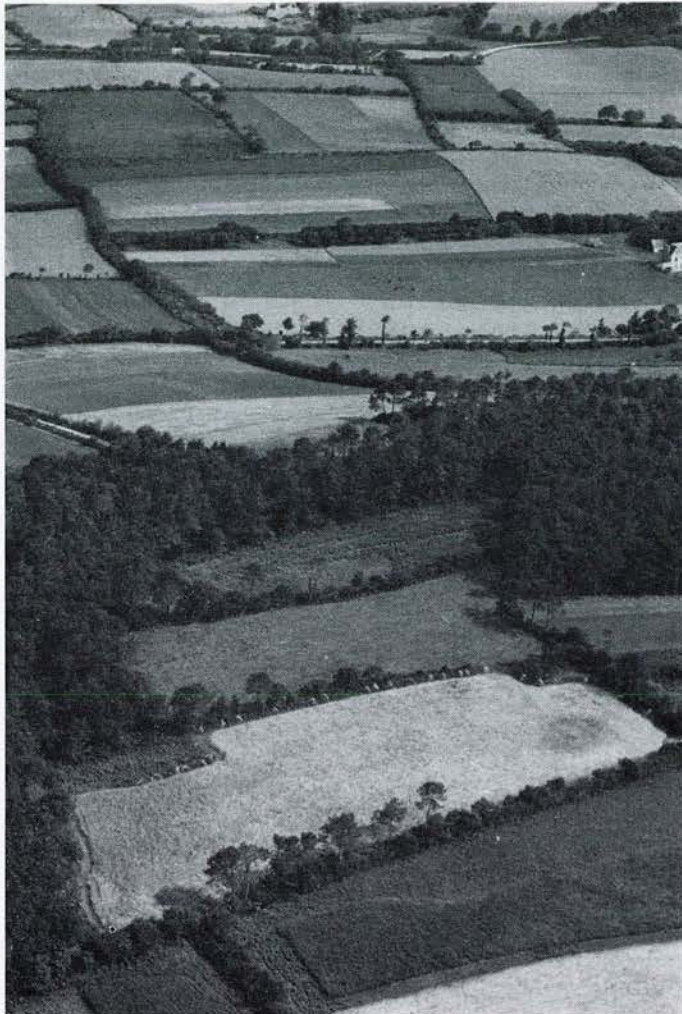
In all OECD Member countries rural problem regions of one type or another exist. They have been bypassed by the economic and social developments occurring in urban and other rural regions and are generally unable to solve their problems with their own resources. In the absence of development measures these areas not only stagnate but tend to decline in their economic and social life.

The basic reason for the depressed state of rural problem regions is the *lack or total absence of non-agricultural employment and income opportunities*. In the initial stage this gives rise to the development of an agricultural surplus population, since land resources can, if at all, only be extended to a limited degree. In a large-scale farming region the result is widespread unemployment of hired labour and in regions of a small-size agriculture farm operators and family labour become increasingly underemployed.

In both cases per capita incomes remain low or even decline in absolute terms.

In a subsequent stage the inadequate living conditions in their home area and the attraction of better opportunities offered in other regions cause an out-migration of the younger and more active elements. This leads to an aging of the remaining population and to a gradual decline of active and total population. With advancing *depopulation*, enterprises in the secondary and tertiary sectors abandon the area and instead of improving, public and social services, including education, deteriorate. This in turn causes further out-migration and the desertion may ultimately reach such proportions that the maintenance of agricultural production is no longer assured.

Many factors individually and jointly are responsible for these developments. One of the most important is the *isolated or peripheral location* of rural problem regions as compared to major growth poles of industrial development. This explains the fact that so many hill and mountain regions, as well as



Rural problem regions are characterised by an agriculture on too small a scale.

frontier areas, are found among depressed rural regions. They were bypassed by early rail and road connections and were thus unable to attract industries or tourism to widen their economic basis. Subsequently many of these regions were opened up and succeeded in developing their economic and social conditions through the introduction of industrial and tourist activities. However, many others still remain in their original state of isolation and are for that reason avoided by industrial entrepreneurs and tourists.

Adverse topographic conditions, through poor soils, sloping of the terrain and frequently low mean temperatures, prevent the development of a more productive agriculture, and thus may also constitute a barrier to the non-agricultural development of regions. A similar effect in both directions may be produced by an *unfavourable water economy*. Insufficient precipitations or their unfavourable distribution not only severely hamper agriculture but may also cause a shortage of water for household and industrial purposes. Similarly too much water, causing flooding and a high water table, may also be an obstacle to overall economic development. These problems can be solved by water supply, irrigation systems, dams, drainage canals and pumping stations, but very often the task is of such magnitude that it exceeds the

financial resources of the regions concerned.

Insufficient traffic and other communications (including telecommunication and postal services), water and sewerage systems, as well as insufficient electrification, are some of the facets of an *inadequate infrastructure* of depressed rural areas. They are also frequently characterised by bad housing conditions, inadequate commercial and private service sectors, poor education, cultural and health facilities, the lack of entertainment and sports opportunities and similar shortcomings.

Low incomes prevent the population from improving their own living conditions, and an inadequate tax basis precludes the improvement of communal facilities. Depressed rural areas are thus caught in a vicious circle from which they cannot escape without outside help. In this context not only the generally low population density but also the *dispersed type of settlement* found in many of these regions are of importance. Many aspects of a developed infrastructure presuppose the existence of a certain population concentration in settlements of a larger size. They not only provide service, supply and market functions for the population within their boundaries, but also for that of the surrounding countryside, and are a precondition for economic growth.

The *unfavourable agrarian structure* and state of technical development are other important characteristics of many, if not all, depressed rural regions. They are at the same time cause and result of the backwardness of these areas. In some regions vast farming estates are still operated under antiquated conditions and employ large numbers of a landless population, who for lack of other opportunities are unable to change their fortune. However, more commonly, rural problem regions are characterised by an agriculture on too small a scale. In some of these an originally adequate size structure has been maintained under the inheritance practice of the law of entail but has become too small for modern farming and income requirements. In others the original situation has been worsened by the inheritance form of equal sharing of property among heirs.

Over time this has led to the creation of smaller and smaller holdings and a situation by which a considerable amount of agricultural manpower is tied to uneconomic farming units. The out-migration of the younger age groups relieves the pressure on the land, but leads to structural improvements only over a considerable period of time. Middle-aged and older farmers hold on to their farms for lack of nearby employment outlets or adequate means of living in retirement. Land fragmentation, particularly in regions with equal sharing practice, worsens the economic situation of the farming population through inefficient use of labour in many areas. In others, systems of land tenancy present a further obstacle to development.

Finally, *economic development* itself may cause hitherto healthy rural regions to become problem regions. Changes in market forces and technology may lead to a re-orientation and relocation of agricultural production to the detriment of certain regions, particularly those with unfavourable natural conditions. Similarly the decline of an important industry in an otherwise little industrialised region may have

grave consequences, since its replacement is frequently prevented by locational disadvantages and the occupational immobility of population. The development or re-development of rural problem regions is retarded or entirely prevented in periods of lacking overall economic growth and at such times they are in greatest need of special government promotion.

Policies and Measures for Rural Areas' Development

In the past, solutions for the problems of depressed rural areas were mainly and sometimes almost exclusively sought through measures in the field of agriculture. However, more and more the conviction has been gaining ground that a comprehensive approach is needed in which agricultural and general economic policies, manpower and social policies are interlinked and co-ordinated with those concerning infrastructure. The reason behind this change in approach is a twofold one: the threat of devitalisation of the countryside through depopulation, on the one hand, growing service and supply problems in agglomeration areas, on the other.

The *improvement of infrastructure* in depressed rural areas has always been a subject of government policies but until very recently the measures taken were rather limited in scope and coverage. They aimed at meeting the basic needs of these regions, rather than providing them with facilities and opportunities as equal as possible to those of the more prosperous ones.

The growing awareness that the continued backwardness of these areas was detrimental to the common interest brought about a considerable change. The range of measures in the field of communications, public utilities, housing, education, health and other public and private services was increased and the standards aimed at were raised. The general acceptance of the fact that modern farming requires such facilities as piped water, electricity and adequate roads, as well as changes in education and training was of importance in this context. But the realisation that an improved infrastructure in the widest sense was a precondition for attracting industries and tourism was probably a more decisive factor. It also caused government to select settlements of a somewhat larger size for special promotion as compared with a widely scattered approach practised initially.

Changes have also taken place in agricultural policies, and price and income support policies have increasingly been complemented by measures to promote the *adjustment of agriculture* to modern conditions and requirements. They concern land reform, farm enlargement and land consolidation to obtain farm units of an economic size and lay-out, modernisation of farm buildings and mechanisation of field and farm work to ensure a rational utilisation of labour resources, and specialisation and vertical and horizontal integration and co-operation to make the best possible use of all factors of production.

It is also becoming widely recognised that a reduction of the agricultural labour force is desirable and necessary for ensuring adequate incomes for those

remaining in agriculture and for obtaining a higher rate of growth in the economy as a whole. Thus many countries have introduced measures to facilitate farmer retirement and the transfer of labour to other economic sectors.

In promoting the *labour transfer to non-agricultural sectors* some countries, at least initially, placed the main emphasis on the geographic mobility of manpower and introduced travel and removal grants as well as settling-in allowances for its stimulation. Others concentrated their efforts on the widening of the economic basis of rural areas through the promotion of industry and tourism activities by grants, preferential credits, tax concessions and other forms of assistance. The latter approach has gained ground in most countries since it is realised that it provides the only means for achieving lasting improvements in depressed rural areas.

Despite this the promotion of geographic mobility must remain a necessary corollary since the development of problem regions requires a considerable period of time and even under optimum conditions the overall choice of available careers will remain limited. In addition, efficient guidance and training systems are a necessary prerequisite for the successful operation of both types of labour transfer.

The Need for Planning, Co-ordination and Integration

In most cases rural areas' development programmes and measures have only been in operation for a limited period of time and this prevents any detailed and final examination of results achieved. Experience to date shows, however, that in view of the nature and complexity of the problems, considerable investments will be necessary in many fields and over a long period of time, investments which often may not yield visible results for quite a number of years. This underlines the need for careful planning and for the integration and co-ordination of measures to make the best possible use of limited funds and other resources.

In all cases a detailed stocktaking of the prevailing situation should precede any other action. This should also comprise an evaluation of the likely future situation in the absence of intervention and should be followed by a determination of policy objectives. The evaluated present position and the determined policy objectives taken together give an indication of the magnitude and type of changes required. The determination of policy measures is then the third step to be taken by governments in order to solve the problems of depressed rural areas.

Policy measures in the various fields should be carefully timed and integrated. Thus farm adjustment measures should be related to those concerning farmer retirement and labour transfer. These in turn should be related to measures concerning training and infrastructure, and those again to others concerning industrialisation and tourism. Such co-ordination can only be achieved by close co-operation between different government departments and agencies and professional organisations at all levels, local, regional and national.



THE OECD TECHNICAL ASSISTANCE PROGRAMME

***to • Greece • Portugal • Spain
• Turkey • Yugoslavia***

With a membership of 21 countries OECD includes the world's most developed nations and certain developing countries as well. The latter have partly emerged from their former state of underdevelopment but they still lag considerably behind the other Members of the Organisation. They are now at what may rightly be called an intermediate stage of development. The countries in question are Greece, Portugal, Spain, Turkey, and one associate member of the Organisation, Yugoslavia.

These five countries are all located on the northern fringe of the Mediterranean basin. Furthermore, they all show the characteristic signs of retarded economic development :

- a gross national product per inhabitant of less than \$ 700 ;
- an agricultural sector which accounts for more than 35 per cent of the total active population ;
- a high rate of emigration (although this has recently been falling owing to economic difficulties in the developed countries of Europe) ;
- a trade balance in deficit and (except for Spain) one in which exports of manufactured goods hardly figure at all ;
- a net consumption of electricity of less than 800 kW/h per head per year.

These are the countries to which the OECD technical assistance programme is directed.

OECD ASSISTANCE TO THESE COUNTRIES

Bases of OECD Action

The developing Member countries of OECD, like the developed countries, participate in the various committees of the Organisation. Yugoslavia, as an associate member, is represented on some of them only.

However, recognising the special position of these five countries, OECD, by the terms of its Convention, incorporated among its aims "sound economic expansion in Member as well as non-member countries in the process

of economic development" and by inference listed the instruments of this solidarity of effort on behalf of the less favoured countries :

- contribution of capital;
- supply of technical assistance;
- finding of new export markets.

Subsequently, the first Ministerial Council of OECD, in setting a growth target of 50 per cent of real GNP between 1960 and 1970 for the Member countries as a whole, recognised that for the developing Member countries this represented "a relatively higher growth rate".

Technical Assistance Programme

These basic aims underlie OECD's Technical Assistance Programme in favour of its Members and associates. Following on from the programmes initiated in 1956 by

SOME COMPARATIVE STATISTICS

(except otherwise stated, data refer to 1965)

COUNTRY	Growth rate 1960/65 (Yearly rate) %	US \$ GNP per capita	Gross invest- ment of % of GNP %	Net Migrat- ion Yearly average 1960-65 thousand persons	Proportion of employ- ment in agriculture %	Infant Mortality Rate %	Imports— US \$ per capita	Exports— US \$ per capita	Consumption of meat per capita — kg	Consumption of electricity per capita — kWh	Telephones per 1000 inhabitants
GREECE	9.0 (1960-64)	590 (1964)	22 (1964)	— 40	55	••	133	38	33	445	58
PORTUGAL	6.4	420	16	— 52	42	65	97	62	22	463	60
SPAIN	9.2	570 (1964)	23 (1964)	— 135	35	37	96	31	28	799	87
TURKEY	4.3	250	••	••	75	••	19	15	••	131	12
YUGOSLAVIA	8.6 (1960-64)	(500)	••	••	(50)	72	66	56	40	679	21
US	4.7	3560	17	+ 366	6	25	109	139	86	5473	478
UK	3.4	1810	18	+ 66	4	20	296	251	70	3084	188
GERMANY	4.8	1900	27	+ 318	11	24	296	303	66	2597	148
FRANCE	5.1	1920	22	+ 296	18	22	211	205	86	1924	124
ITALY	5.1	1100	19	— 86	26	36	142	139	36	1394	116
JAPAN	11.1 (1960-64)	850	32	— 15	26	19	83	86	9	1720	112

() = estimated figures

•• = not available



OECD consultants visit the Kosova Kombinat power plant for lignite in the Kosmet, Yugoslavia

the former OEEC and the European Productivity Agency, this programme is now concerned with the different aspects of economic development.

The present programme has a modest budget of \$ 2 million which is apportioned among the five recipient countries, Italy and Iceland having been replaced by Portugal and Yugoslavia. But these five countries, in addition to their normal contribution to the general budget of OECD, contribute 25 per cent (30 per cent in the case of Greece and Spain) towards the financing of their respective shares in the technical assistance programme.

The Technical Co-operation Committee, on which are represented all the Member countries together with Yugoslavia, and the European Economic Community as an observer, undertakes as its main functions to draw up the OECD Technical Assistance Programme, supervise its execution and assess the results. The Council of the Organisation has also assigned the Committee a number of other tasks : namely to help the recipient countries which so request to set up or improve national institutions for technical assistance; to organise reviews of their technical assistance policies, requirements and programmes if they so desire and to ascertain the lessons to be learned from the implementation of the Organisation's Technical Assistance Programme, so that donor and recipient countries at large benefit from this experience.

CRITERIA OF OECD TECHNICAL ASSISTANCE

For its own guidance, the Technical Co-operation Committee has had to adopt definitions and select criteria. Technical assistance is taken to be the transfer of skills and knowledge from abroad. For developing countries the transfer of skills must be promoted by all available means if the gap between them and the developed countries is to be narrowed. This is where aid donors and, among them OECD'S Technical Co-operation Committee, can make a significant contribution, by organising, financing and above all accelerating this process. OECD technical assistance projects are based on the following main principles :

- Projects should reflect a country's development priorities. This may involve assisting in planning and above all implementing development programmes, strengthening the institutional base, multiplying training facilities, and tackling major structural problems.
- Effectiveness of technical assistance is enhanced by being planned and executed in the form of integrated projects. This entails, from the outset, a clear statement

of the problems and objectives, where possible a time phased operational plan, and a regular reviewing procedure to plot progress.

- Where possible technical assistance should reinforce fully-fledged national development projects, so that technical and financial resources will be given the best chance of achieving a permanent and preferably joint impact.
- Projects should by definition be temporary arrangements designed first to solve a problem because of a lack of qualified personnel, and, second, to institute a permanent means of dealing with the problem after technical assistance has terminated. They must then be self-liquidating.
- To succeed, a project should of necessity be practicable in terms of the real situation of a country. Apart from an appraisal of economic objectives, project planning must then include an assessment of the amount and quality of local human and material support, legal authority, and the project's subsequent development potential.
- OECD technical assistance is a conscious attempt to give practical effect to the economic discussions of its policy and aid committees. Project orientation, therefore, tends towards those areas in which OECD possesses its own expertise.
- Care should be taken to verify that projects do not overlap with activities already undertaken by other technical assistance donors.

OBJECTIVES

Limited financially, the scope of OECD technical assistance is correspondingly limited, in order to achieve greater concentration, and hence increased effectiveness. The map indicates the major fields of OECD technical assistance, and underlines the recurrent sectoral pattern of individual country programmes. Specific projects within these sectors aim at six major objectives, which are key factors in the development process. They are illustrated below with examples of what OECD is doing in the field.

Strengthening Development Institutions

In each of the five participating countries, national development planning is strongly supported. This has in turn entailed expanding this aid to cover ancillary government institutions such as national statistical institutes, regional planning services, educational and manpower planning units, and development banks. One example is OECD's support to the Technical Secretariat of the Prime Minister's Office which is responsible for planning in Portugal.

MAJOR FIELDS OF OECD TECHNICAL ASSISTANCE

PORTUGAL

- Economic Development Programming
- Industrial Development
- Agricultural Development
- Educational Development
- Manpower
- Promotion of Tourism

SPAIN

- Economic Planning and Statistics
- Regional and Industrial Promotion
- Civil Service Training
- Agricultural Development for the Ebro Valley
- Development of Higher Scientific and Technical Education
- Manpower Development

JOINT ACTIVITIES

- Scholarships
- Seminar on Aspects of Public Administration
- Training Course in the Planning and Programming of Education Development
- Seminar on Cost Analysis of School Building
- Seminar on Manpower Policy

NB. These projects pertain to the 1967 Programme

OECD technical assistance to Portugal began in 1963, and first priority was at once given to assisting the Technical Secretariat. Its initial major job consisted of building on to two previous rather limited planning exercises by drafting an Interim Plan for the period 1965-1967, and subsequently by preparing a Third Plan (1968-1973) covering numerous economic and social objectives. One of its particular tasks is to service the inter-ministerial groups formed to analyse specific sectors, and common problems like financing, manpower, and social services.

Technical assistance has played an essential role in helping the Technical Secretariat work out the implications of alternative growth rates, and have the most suitable assumption officially adopted. Portuguese planners were assisted by experts in establishing formal procedures for sector programming, and for achieving compatibility between these programmes and overall planning. Recommendations followed affecting the entire structure of the statistical services responsible for plotting major economic and demographic trends, and the resulting reorganisation is still in course. Other experts have covered industrial programming, export promotion and regional planning. Training has taken place in Portugal and abroad. Currently, advice is being given on the final drafting of the Third Plan, and on setting up an adequate system of short-term forecasting.

Immediate technical assistance objectives have been

achieved — namely building up and training a composite Secretariat in sophisticated planning techniques. The next stage, which is already programmed, will help guide the Portuguese authorities in assessing implementation, and in subsequently adjusting annual programmes and specific development projects.

■ Increasing Training Facilities

The chief disadvantage suffered by all countries in a state of retarded development is a shortage of skilled personnel. Training this personnel at all levels is a prime necessity vital to any development effort. For this reason the Centre for Agricultural Development of the Ebro Valley, at Saragossa (Spain), was set up.

In 1963 the Spanish authorities and the OECD Technical Assistance Programme launched a scheme for the promotion of agricultural production in the Ebro basin. Originally, the scheme was centred on horticultural production and an advanced course of horticultural training was arranged at an experimentation centre already in existence. A staff of foreign teachers, who were gradually relieved by Spanish nationals, first of all trained specialists in marketing and then in fruit and vegetable growing techniques.

The year 1966 saw the beginning of a similar course in animal husbandry and a centre of zootechnical re-



search is now in the course of construction. At the same time the first steps were taken towards setting up within the Centre a Bureau of Agricultural Development for the Ebro Valley. The Centre has announced that it is now ready to place its experience at the disposal of developing countries faced with problems similar to its own.

■ Expanding Education and Research

OECD technical assistance has been brought to bear on a number of key areas affecting formal education and research. Education planning projects (such as the Mediterranean Regional Project), current exploration of curriculum development policies and scientific and technical research facilities illustrate this action. More specifically the Organisation has extended support to worthwhile university projects. The Middle East Technical University (METU), Turkey, is a case in point.

Starting with 71 students in 1956 and pledged to double the present enrolment of 5,000 by 1972 METU is in all probability the fastest growing university in the world. Situated in the foothills around Ankara, it was created as an academic centre for the Middle East orientated towards the actual technical problems of the region. The University differs from traditional Turkish universities in several far-reaching ways: teaching is in English, and government is by an independent Board of Trustees drawn from business as well as academic circles.

METU absorbs as much as 7 per cent of all technical assistance to Turkey — there being an annual presence of some 80 foreign faculty members. Aid donors, about ten in number, have developed a convenient system of co-ordinating their activities by assuming responsibility for particular departments. The United Nations, which helped found the University, has, for example, assisted Engineering and Architectural Departments. OECD started with the Department of Economics and Statistics in 1964 and subsequently helped inaugurate a Graduate Department of Regional Planning.

OECD technical assistance is designed to train Turkish staff in these subjects and to furnish interim teaching. These two Departments lend themselves particularly to OECD assistance, not only because they reflect the Organisation's work, but also because they form a vital source of qualified manpower for other important areas of OECD aid: national and regional planning, statistics, development banking, state enterprises, etc. The next steps will help develop graduate programmes in economics and statistics, economic research projects, greater practical use of regional planning personnel in the field. METU is a critical user of OECD technical assistance. On this basis future technical action can look to results as positive as those already achieved.

■ Eliminating Structural Obstacles to Growth

To tackle the complete range of industrial development problems is far beyond the means of the OECD Technical Assistance Programme. Certain particularly sensitive

areas have, therefore, been singled out, among them reorganisation of the large public sector in Turkish industry. Almost half of the industrial production of Turkey is accounted for by State Economic Enterprises. These enterprises are particularly vital in the transport, electricity, and banking sectors. For structural reasons and lack of qualified manpower with a knowledge of modern management concepts, their profitability was low and most of them showed a loss. Their total assets are estimated at 50 billion Turkish Liras (over \$ 5 billion).

In 1961 the Turkish Government decided to act. At the request of the Turkish authorities foreign consultants provided by OECD and the United States joined the Turkish experts to examine the problem. Their report led to the establishment of a Reorganisation Committee whose mandate is to make recommendations to the Government on the internal structure of these enterprises; lay down general principles for improving productivity; make proposals for their regrouping; and suggest rational procedures on which to base their future relationship with the Government.

To aid the Reorganisation Committee in its task OECD has provided consultancy services since 1965. Modern management techniques are being disseminated by means of seminars and implemented through in-service training. The latest methods in production planning and control, work study, marketing, organisation and personnel management are being applied in selected pilot enterprises.

Action is geared to obtain rapid results, so that the Commission, whose mandate terminates in March 1968, can formulate conclusive recommendations for increasing enterprise profitability by improved management methods, thereby generating additional investment resources for Turkish development.

■ Administration and Development

To modernise the administration is to improve the machinery of development policy. The five countries are endeavouring to do so with the aid they are receiving or will shortly receive under the Technical Assistance Programme. In the case of Greece, three main spheres of action have been selected: training of civil servants; organisation and service methods in public administration; study of administrative structures.

Begun in 1963, following other bilateral and multilateral programmes, this action is intended to back up the efforts of the Greek authorities. Local courses and individual or group training abroad enable civil servants to be trained for the various ministries and semi-governmental bodies. These efforts are expected to result in the creation of an Institute of Public Administration.

A Central Service for Organisation and Methods has been set up by a team of foreign experts for the purpose of creating individual units in the ministries. The study of administrative structures had for a first result the establishment of an administrative research committee and of regional committees for economic co-ordination. It is proposed to establish a new corps of senior civil servants. The postal services are being reorganised.



The electronic laboratory of the Middle East Technical University, in Turkey, where OECD has provided technical help for the Department of Economics and Statistics.

These improvements, which have been introduced in a particularly difficult sphere, were made possible solely by the favourable climate engendered by the large-scale publicity given to the problems of administrative reform by the Greek authorities.

■ Opening the Way to Investment

The five participating countries are all in their different ways concerned by this problem. In Yugoslavia, the regional development scheme introduced in the autonomous province of Kossovo-Metohija (Kosmet) is a case in point.

Situated in the south-east of the country in the Republic of Serbia and peopled by more than one million inhabitants of varied origin, this province of 10,000 km² with a density of 90 inhabitants to the km² is the poorest in Yugoslavia. The annual per capita income is no more than \$ 150, while the increase in population is more than twice the national average. The chief activity is still farming, but the real chances of development lie in the province's plentiful natural reserves : lignite, tin, zinc, nickel, chromium, etc., which clearly point to an industrial future.

The principal aim of the technical assistance scheme, which began as early as 1962, is the development of a chemical industry based on lignite and its derivatives (fertiliser, gases, synthetic fibres, lignite ash, etc.), and the Government of Kosmet is already studying the results of pre-investment surveys. But to take account of the other sectors which must likewise progress if the required level of overall development is to be achieved, technical assistance has also been supplied in connection with the textile industry, where productivity has increased, vocational training and agricultural improvement (irrigation,

stock rearing, fruit and fodder crop growing, farm management, etc.). This overall scheme has been facilitated by the fact that OECD is the only supplier of technical assistance to Kosmet.

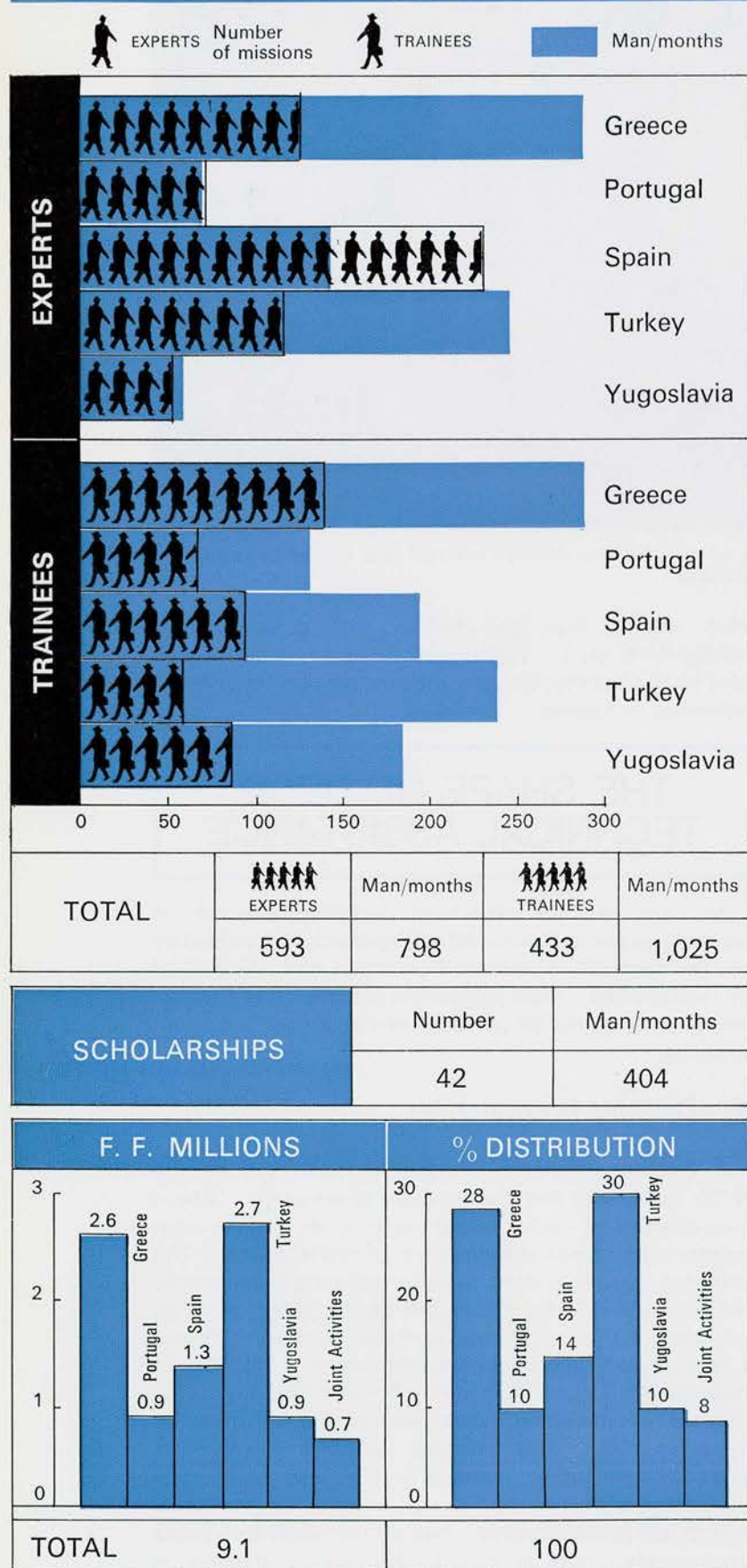
THE SHAPE OF OECD TECHNICAL ASSISTANCE

To carry out the objectives described overleaf an annual programme of some 40 to 50 projects is approved by the Technical Co-operation Committee and Council of the Organisation. This programme is made up of Country Programmes, using 90 per cent of the funds, and Joint Activities.

■ Country Programmes

A Country Programme is jointly formulated by the OECD Secretariat and the recipient government. About three-quarters of each programme consists of long-term projects mostly aimed at the building of new institutions. The remaining quarter is used to cover urgent current needs, which for special reasons cannot be the object of long-term planning. An attempt is made to work a degree of homogeneity into a country programme. The Turkish programme is a good illustration of this : here the OECD effort has been based on Turkey's own programme of reform started in 1960. This involved initiating development planning, modernising statistics and revitalising the state enterprises and the civil service. Nearly all individual projects are interconnected : making the state enterprises economically viable is thus backed up by training in

1966 TECHNICAL ASSISTANCE IMPLEMENTATION DATA



investment project preparation and support of the State Investment Bank.

OECD technical assistance projects are executed by means of expert missions, carried out by individuals often of a very senior level or by consulting firms. These missions are designed to include an important element of local training which is often supplemented by the provision of training abroad. An indication of the volume of experts and trainees financed by OECD in 1966 is shown in the Table.

Joint Activities

Some development problems of participating countries call for a joint approach. Action of this kind, termed "Joint Activities", is initiated at OECD headquarters and is only undertaken if there is a clear comparative advantage in attacking problems on a multi-country basis. In practice this has meant two types of project : postgraduate scholarships in subjects directly relevant to economic development, which are open to individuals on a strictly competitive basis (see below); and conferences and seminars bringing together high government officials, responsible for policy making in participating countries, with internationally known experts. In the last six years such gatherings have discussed major policy issues related to regional development, industrial development and financing, public administration, public finance, tourism development and different aspects of technical assistance programming (1). Besides generating development ideas for discussion, they form a valuable bridge between OECD's technical assistance and the work of other Committees of the Organisation.

Conditions

Just as in financial aid to developing countries, the time between pledging and actual disbursement of funds is lengthened by difficulties peculiar to each case, so technical assistance action is open to a multitude of eventualities which intervene between programming and successful implementation. Ultimately effectiveness of technical assistance work depends on the human element : an expert must convince and train ; his local counterpart must be convinced and trained, as well as have the power to act.

Each technical assistance action presupposes at least these simple basic conditions if any result is to be achieved. Yet they are surprisingly difficult to attain. This is why OECD gives primary importance to such factors as selection and briefing of experts, prior screening of projects, assessing priorities, co-ordinating action in the field, and evaluating past experience. In a sense, therefore, administering technical assistance itself includes a strong element of technical assistance.

(1) As a result of these meetings, the following reports were published : *Regional Economic Planning* (1961), *Methods of Industrial Development* (1962), *Government Finance and Economic Development* (1965), *Public Finance as an Instrument for Economic Development* (1965), *Regional Development and Accelerated Growth* (1965), *Public Administration and Economic Development* (1966), *Tourism Development and Economic Growth* (1967).

VOCATIONAL EDUCATION :

pre-requisite of a modern economy

The preparation of young people for employment and the adjustment of workers to changes in a rapidly developing economy are matters of serious concern to the governments of the OECD countries. An overhaul of the existing systems is necessary and reforms have already been begun in a number of countries. To give the responsible authorities a general picture of the situation, about which very little was known formerly, OECD's Manpower and Social Affairs Directorate asked Roger Grégoire, Conseiller d'Etat and Président du Conseil de Gestion du Fonds de la Formation Professionnelle et de la Promotion Sociale (France) to make an overall summary of the available information and identify the broad principles on which the new policies are being framed. The following article covers some of the topics developed in the report by M. Grégoire which will shortly be published under the title "Vocational Education".

A better vocational education at all levels is essential to economic growth. The speed-up in technological progress and the resulting economic and social changes have revolutionised the basic problem. Since the first world war and particularly since the second, not only the techniques and organisation of vocational education but its very objectives have been challenged (1). In most of the OECD countries reforms have either been attempted or are in progress and wherever the responsible planners consider that old-established methods still yield satisfactory results, public opinion is inclined to be sceptical.

This rethinking is widespread, but although the solutions envisaged are comparable in their main lines, an examination of their details often makes them appear contradictory. Every country is what its history, its traditions, the particular needs of its economy and the structure of its educational system have made it. But all countries seem at the moment to be grappling with a number of common problems: only recently their vocational education systems

presented the same features, i.e. they were quite separate from the general educational system, they were highly specialised and the numbers they catered for were limited.

An isolated, Limited System Catering for a Minority

Not so long ago the links between vocational and general education were very tenuous. In most European countries the preparation for a working career does not begin until the end of the compulsory period of schooling. Even when this preparation is provided at school it is still separate from secondary education in almost all countries. It has long been run by separate authorities and often continues to be.

For many years the United States has had only one type of secondary school but even there vocational education is not completely integrated. At the end of the 19th Century the "vocationalists" advocated the installation of workshops in high-schools so as to give each pupil a complete schooling from his hands to his head. But the promoters of the Smith-Hughes Act were afraid that the vocational syllabuses might fall under the influence of general education and thus lose their originality.

(continued on page 28)

(1) The term "vocational education" covers all forms of preparation of further training for employment and includes theoretical knowledge, practical skills and even the transmission of the ethical values and social outlook required for the exercise of any particular activity.

They therefore pressed for these syllabuses to be handled separately and carried the day despite warnings of the political and methodological dangers of this dual system. The specifically vocational education provided in high-schools is therefore still essentially practical and does not normally lead to studies of university level.

The most serious consequence of this separation is the discredit it throws on vocational education. Because it is not equivalent to normal secondary education and does not offer the same possibilities of extension, e.g. to higher education, it holds little attraction.

Too often it is taken up by pupils who have failed elsewhere or have fallen behind in their schooling. It has been said in some countries to cater generally for the "throw-outs" of the educational system. This view is an undoubted exaggeration but it does contain a good dash of truth.

Furthermore, vocational education up to the present has been solely concerned with preparing workers for specific jobs. The aim of general education on the contrary is to give all young people a common culture, mainly to ensure social cohesion. Despite the development of industry the idea of specific "trades" inherited from the craft guilds has led to a wide diversification of training.

For example, in the United Kingdom the City and Guilds of London Institute organized 128 different examinations in the period 1964-1965. In France the number of vocational training certificates (CAP) exceeded 700 in 1962 of which 250 were awarded for national, and 468 for provincial examinations. In Germany there is an organised apprenticeship in every recognised trade : in 1962 there were 495 in addition to the 124 handicraft trades.

The distribution of young people among these trades is very unequal. It is estimated that about 60 trades alone cover about 90 per cent of the candidates for the French CAP. A further fact to be borne in mind is the weakening of the link between specific training received and actual employment taken up. For example, in the engineering industries the proportion of workers holding a job corresponding to their

skills varies between 9 and 25 per cent from one country to another.

Thirdly, vocational education has so far been provided for only a proportion of future workers whatever the system in force (Table 1). In the United Kingdom the official figures show that only one-third of the boys who leave school between 15 and 17 take up an apprenticeship; the rest begin as unskilled workers or low-grade office staff. In France the War Ministry notes every year that more half the conscripts called up for military service have either no diploma or nothing more than the certificate marking the end of their primary schooling. In the United States out of 6 youths taking up employment 3 or 4 at most are actually prepared for their working career.

The position seems to be better in Germany where the number of apprentices has doubled in industry and quadrupled in commerce since 1945. Only 25 per cent of young workers take up employment without receiving or having received other than a vocational education.

The fact is that any survey of vocational education in the various countries is considerably hampered by lack of data. Estimates may be made but their accuracy cannot be guaranteed. A breakdown of pupils by age groups and types of education, the exact number of apprentices who successfully complete their training and the number of diplomas issued by vocational training schools, are not known with any certainty and where statistics are available their basis varies from one country to another. Much has yet to be done in respect to this.

The Challenge to Traditional Thinking

Rapid changes in the economy and its needs have led to a general rethinking of vocational training concepts. The level of labour is bound to rise but the future worker needs a general education offering

1. AVERAGE RATIO OF EXTENDED SCHOOL ATTENDANCE AND MAXIMUM PROPORTION OF ADOLESCENTS RECEIVING VOCATIONAL EDUCATION

	Reference Year	Age Group	Average Rate of "extended school attendance"	Maximum Percentage of adolescents receiving vocational education	Percentage of professionally uneducated
Germany	1962-3	15 to 17	67.8	57.8	32.2
Belgium ⁽¹⁾	1962-3	14/15 to 17	61.5	31.2	38.5
France	1962-3	14 to 17	64.5	33.5	35.5
Netherlands	1962-3 ⁽²⁾	14 to 17	55.7	21.2	44.3
United Kingdom	1961-2	15 to 18	54.7	23.0	45.3
United States	1962-3 ⁽³⁾	14 to 17	85.5	18.8	14.5

(1) Boys only.

(2) 1959-1960 for 15 and 17 years of age.

(3) 1963-1964 for 15 and 17 years of age.

2. LENGTH OF COMPULSORY FULL-TIME SCHOOLING

Country	Length	Age Limits	Date of last relevant Act	Planned or contemplated future development
Germany	8 or 9 (1)	6 to 14 years of age 6 to 15 years of age (1)	Variable : 1962, 1963 or 1964	The general introduction of 9 years' compulsory schooling was decided by the Hamburg Convention of 28th October, 1964 (2)
Belgium	8	6 to 14		Extension contemplated by the School Pact of 1958 : 9 years (6-15) in 1965 10 years (6-16) in 1968
France	8	6 to 14	1936	Extension decided by Ordi- nance of 5th January, 1959 : 9 years (6-15) in 1965 10 years (6-16) in 1968
Netherlands	8	7 to 15 (3)	1950	
United Kingdom	10	5 to 15	1944 or 1945	Extension contemplated to 16 as soon as circumstances permit
United States	9, 10, 11 or 12	6/7 to 15/18	Dates vary according to States	

(1) In 7 Länder out of 11. (2) The Hamburg Convention concluded on 28th October, 1964, between the representatives of the German Länder provides that the period of compulsory schooling "may be extended to 10 years". (3) In practice most children start school at the age of six.

him subsequent chances of rapid and successful specialisation rather than a stock of specialised knowledge giving him mastery over a limited skill likely to become obsolete sooner or later.

Educationists and business managers are gradually approaching agreement on these two points. For many of them the traditional idea of skilled trades or occupational categories has gone by the board. When division of labour developed, the number of skilled trades greatly increased and their definitions became more and more specific. This tendency was reinforced by the desire not only to protect each trade but to provide workers with the training most adapted to the tasks they would be called upon to perform. But events and institutions have since followed divergent trends and many trades now only exist on paper. They have either almost disappeared or are now practiced by only a few people.

An estimate compiled by German specialists shows that in 1963 all apprentices in industry and commerce were divided among a dozen groups of closely related occupations. "Labour and occupational requirements", writes a German manufacturer, "can no longer be calculated on a long-term basis. The objective of any training can therefore no longer be to learn a trade in the traditional sense of the word. What is now necessary is a range of knowledge and skill". In the United Kingdom it has been proposed that the traditional trades which are now the subject of a complete and specific training should be replaced by a "spectrum" of jobs. In France, Jean Capelle and Michel Vermot-Gauchy estimate that all the specific trades defined in the CAP programmes could be regrouped under about 30 headings.

A number of other developments have further revolutionised the factors governing vocational training. One of them is the extension of the school-leaving age. Up to the last few years it was only in the countries of North America that a long period of full-time schooling was required. Although the age of compulsory schooling varies from nine to twelve years according to the State over, 70 per cent of 17 year-olds in America attend high school. Since the second world war an extension of the school-leaving age has been introduced or is under consideration in most European countries. (Table 2)

The extension of the school-leaving age has three effects on vocational education.

- In the first place a longer period of schooling can only be effective if it is a preparation for a working career. The experience of the United States proves that after a certain age many young people lose interest in school work even if the syllabus offers a wide range of choice. Despite many years of campaigning to induce young people to continue their studies, 35 per cent of them do not complete their high-school course. This drop-out which eventually represents an economic and financial loss to the country and an intellectual and psychological problem to individuals and the community has become a serious issue in Canada.

- An education for young people as a whole can no longer be regarded solely as a way of access to the university. Even in North America where secondary education has become general the majority of pupils embark on secondary schooling as a way of reaching the university. The usual disciplines are over-

3. EVOLUTION OF MANPOWER REQUIREMENTS FORECAST IN THE UNITED STATES

		1960 *		1975 **	
		Million	%	Million	%
WHITE COLLAR	Professional and technical	7.5	11.2	13.2	14.9
	Managers and proprietors	7.1	10.6	9.2	10.4
	Clerical workers	9.8	14.7	14.6	16.5
	Sales Personnel	4.4	6.6	5.8	6.5
BLUE COLLAR	Craftsmen and foremen	8.5	12.8	11.4	12.8
	Semi-skilled operatives	12.0	18.0	14.8	16.7
	Labourers (exclusive of farms and mines)	3.7	5.5	3.7	4.2
	Service workers	8.3	12.5	12.5	14.1
	Farm workers	5.4	8.1	3.5	3.9
TOTAL		66.7	100	88.7	100

Sources : * "Manpower Report of the President", March 1966, pp. 164 and 165; ** "Technology and the American Economy" Report of the National Commission on Technology, Automation, and Economic Progress, Vol. 1, February 1966, p. 30.

crowded and young people drift into vocational training when they have failed elsewhere. According to the *American Council of Education* this problem can only be solved by giving vocational training a status and a prestige. Secondary education will therefore have to jettison the theme of "disinterested" study by which it is often still characterised. (Table 3)

- A long period of compulsory education makes it easier to acquire a vocational specialisation and should make the process shorter. School-leavers who are unwilling or unable to go on to higher education but have been partly trained for an occupation will be able to take up a specialised job after only a little further training. This will ease what is often a rough passage from school life to a working existence. The link between theoretical knowledge and practical experience will fall normally into place.

Integration in the Teaching System

The present trend will thus provide new opportunities for vocational education. But the latter will have to sacrifice its particular characteristics if it is to be incorporated into an overall permanent educational system and even become an essential component in that system. The experiments and reforms now in progress show that the very conception of vocational education is everywhere changing. Although each country is intent on preserving its own solutions, even within such regional organisations as EEC, a number of fairly comparable schemes are here and there emerging. In particular there is a tendency for the distinction (not to say opposition) between general education and the preparation for a career to disappear. As this tendency develops, new educational schemes are emerging to meet economic needs. These schemes are widely accessible and consist of successive stages leading through the period of compulsory schooling up to the threshold of a

career. Education is becoming more and more vocationalised.

The right of all young people to a thorough preparation for their working life is acknowledged by all OECD governments. At the same time vocational education, as a general basic instrument, is tending to become compulsory. It is a de facto compulsion but is just as imperious as if it were enforced by law. Access to employment and prospects for a career are increasingly subordinate to preliminary training. Reforms are now being carried out which are designed to obviate any need to resort to makeshift schemes in order to salvage inadequately trained adults in the coming years.

Educationists, employers and unions are unanimous in acknowledging that even at the lowest level vocational education cannot be limited to the acquisition of the knowledge and outlook required to exercise an occupation. They want it to give workers self-reliance and the ability to improve their skills. This is the first reason for bridging the gap between traditional and vocational education.

There are also two other reasons. In the first place the content and methods of vocational training are being gradually incorporated into general education; they are essential educational media for interesting the majority of pupils and ensuring their progress. Secondly, the new objectives of vocational education and technological progress call for closer co-operation between education and training. The course in general education required of young workers as an afterthought under many legislative systems is no longer sufficient, as is proved by the narrowing of the gap between the major German firms and the vocational training schools and the importance attached in the United Kingdom to co-operation between industry and the educational authorities.

Lastly, instead of catering in most cases for children, as it does today, vocational education will be designed for young people nearing the end of their compulsory schooling (there will be no more fourteen or fifteen-year-old apprentices) or even for adults.

This is a complete reversal of values. All educational systems have been systems of general education. They were a reflection of their particular society, where tradition was stronger than change, the fostering of individual talents was preferred to collective development and culture had precedence over production. This was the position in pre-industrial societies.

The systems which are now emerging, however, will be built around vocational education. They will be the reflection of mobile societies motivated by the quest for prosperity and conditioned by technological change. These societies will undoubtedly be no less socially stratified than those of the past but the justification for their social strata will be different. A meritocracy based on careful selection will replace the empirical categories of the past. The academic streams in the secondary school system which in many countries still attract the majority of pupils will no doubt be reserved for a minority considered capable of profiting from a higher education. The normal streams will be the practical ones which lead as rapidly as possible to a working career.

To ensure that vocationalised education which is essentially utilitarian does not fail to exploit abilities which are unusual or develop late, it will have to fulfil three conditions :

- It must not be solely designed to satisfy manpower demands.
- It must endeavour to detect and foster all talents.
- It must avoid the consequences of mistaken vocations by making it abundantly possible to switch from one track to another and by providing opportunities of advancement.

Whichever road is chosen, education must be total. It must meet all the aspirations and all the needs of all who receive it and the community in which they live. The objectives of vocational education must not only be economic but also cultural and social.

An Obsolete Problem : the allocation of responsibilities

In these circumstances the rather naive allocation of the responsibilities and functions of vocational education as between educational authorities and employers is also ripe for change. In all countries at the present time the allocation of responsibilities is based on the legal status of the person undergoing a particular course of education. If they are not wage-earners responsibility devolves on the educational system even if the tuition involved is essentially a practical one. But, if they are wage earners, responsibility falls on the employers and in certain cases their trade organisations, even if the education provided is partly theoretical. Young workers bound by an apprenticeship contract are considered to be wage-earners. In countries where supplementary training is compulsory as in Germany and France or

optional as in the United Kingdom trainees are subject to the educational authorities not in virtue of their status as apprentices but in virtue of their age.

The result of this distinction is that responsibility at government level is generally assigned to two ministries, one in charge of public education and the other in charge of labour and employment. A special difficulty arises in countries with a federal structure where education is generally the responsibility of the federated states.

Whatever the country's structure there is a further difficulty. For many years the educational authorities devoted scant interest to vocational education. An example is the struggle which was necessary in the United States to introduce this education into the high-schools. Admittedly, the authorities have considerably broadened their outlook but directors of education, who mostly consist of university graduates with a cultural bias, have until recently failed to appreciate the practical objectives of a cultural education and the teaching value of a practical training.

On the other hand many firms and employers' organisations still have too narrow a conception of vocational education. Some of the most influential regard apprentices as cheap labour despite their low output. The ministries responsible for employment have long restricted their role to labour regulations and the protection of workers. This accounts for the spirit of the apprenticeship legislation. They too have recently widened their outlook and in practically all countries they are now responsible for the stability of the labour market. Their competence in vocational education is limited both by the functions of the educational authorities and by the fact that industry and the trade associations are left a free hand. A result is that they do not generally intervene except to make good deficiencies or apply a stimulus.

The distinction between the different responsible authorities is however becoming less clear-cut. It depends on institutional factors far more than practical or teaching considerations. In countries where the intention is to limit the part played by the educational system and leave the employers and trade associations masters of vocational training few people are now prepared to defend in-service apprenticeship.

On the other hand in countries where it is preferred to assign this education to independent institutions the impossibility of dispensing with the co-operation of industry is realised. Irrespective of the political motivations which lead to apparently contradictory solutions there is a growing similarity in the methods used. Schools now have workshops and firms or groups of firms are providing their apprentices with genuine schools.

Both parties feel the need to co-operate. Co-operation will become increasingly necessary as and when the school-leaving age is raised, secondary education becomes vocationalised and, as adult education really materialises, the school system will have to help in the provision of greater opportunities for adults.

RESOURCES DEVOTED TO RESEARCH AND DEVELOPMENT IN OECD MEMBER COUNTRIES

The growing recognition of science and technology as an important factor in the economic and social progress of the OECD has led the Member countries to make a major effort to improve their statistics on research and development. In 1964 the OECD countries accepted the "Frascati Manual" which lays down agreed statistical definitions on the basis of which Member countries will progressively standardise their statistical procedures in this field. The International Statistical Year was launched in order to accelerate the collection of comparable data based on the Frascati Manual. 16 Member countries returned the relevant information based on the year 1963 - 1964, many of them undertaking special surveys and enquiries. The first of the reports on the ISY results (1) is a general analysis of the efforts of Member countries in their promotion of research and development. It attempts to identify the scale and structure of research and development efforts and to make significant comparisons between OECD Member countries. It is hoped that this report will contribute to the clarification of existing public discussions on this matter, in particular in connection with technological disparities between Member countries, though it should be remembered that the data discussed relates only to "inputs" into R and D and does not justify conclusions about the "output" of R and D or a fortiori about the whole innovation process.

The report has been prepared by, and is published under the responsibility of the OECD Directorate for Scientific Affairs. Members of the staff who particularly contributed to this analysis are : Y. Fabian, J. Hillig, A. Villiger, and A.J. Young.

(1) "International Statistical Year for Research and Development. A Study of Resources Devoted to R and D in Member Countries, 1963-1964, Vol. I : The Overall Level and Structure of R and D Efforts in OECD Member Countries."

Gross National Expenditures on Research and Development

OECD Member countries vary considerably in the amount of resources they have available to devote to research and development. In order to make meaningful comparisons it is better to class them according to size and economic structure. Leaving aside the USA, five of the respondents, France, Germany, Italy, Japan and the UK may be considered as "sizeable industrialised countries". The range of gross national expenditure on R and D (GERD) in this class runs from \$2,200 million in the United Kingdom to \$290 million in Italy. Six countries, Austria, Belgium, Canada, Netherlands, Norway and Sweden have been classed as the "smaller industrialised" group. Of these the highest gross national expenditure on R and D is \$425 million in Canada and the lowest is \$13 million in Austria. In the five "developing" countries who reported, two, Spain and Turkey, spend over \$25 million and Ireland, Portugal and Greece about \$10 million.

It is obvious that no other single Member country has resources of the same order as the USA and it is perhaps better to compare her R and D efforts with those of a group of countries roughly equal in population and GNP. At official exchange rates the USA spends three times as much on R and D as all reporting European countries combined (2) and six times as much as the Common Market countries.

Manpower Working on R and D

Manpower comparisons, though affected by certain technical factors, avoid the exchange rate problem and in these terms the differences between Member countries are less marked. In terms of the total number of qualified scientists and engineers (QSE) and technicians employed on R and D, Japan rises to the top of the sizeable industrialised class, with 187 thousand. The UK, Ger-

(2) Including an estimate for major international organisations.

many and France, allowing for variations in the year of survey, all employ the full-time equivalent of about 100,000, as against 30,000 in Italy.

The range in the smaller industrialised countries runs from 31,000 in the Netherlands to 3,000 in Austria and in the developing countries from 6,500 in Spain to 1,300 in Greece. In these terms the difference between the USA and Europe is less pronounced. The USA/Western Europe ratio is 1.7 : 1 and that for the USA/Common Market 2.6 : 1. How far this difference between the expenditure and manpower ratios is due to the deficiencies of official exchange rates for R and D comparisons and how far it reflects a higher real provision of facilities per QSE and technician cannot be stated with precision.

Related to National Resources

Another way to compare R and D efforts is in relation to national resources. Perhaps the best known measure of this kind is the percentage of GNP (at market price) devoted to R and D, though other interesting measures are employment on R and D compared with population and per capita expenditure on R and D. In all these terms the United States devotes more proportionately as well as absolutely to R and D though, of course, per capita expenditure on R and D is probably over-estimated in comparison with other OECD Member countries at official exchange rates.

Of the sizeable industrialised countries the United Kingdom devotes the largest percentage of GNP at market price to R and D and Italy the lowest. The ranking is the same for per capita expenditure. However, as in the absolute comparison, Japan rises to the top of the sizeable industrialised class for the manpower measure, though, allowing for the fact that the Japanese data has not been reduced to full-time equivalent, the differences between the first four is very small.

In all these comparable measures the Netherlands and Sweden devote as large a share of resources to R and D as the sizeable industrialised countries, and Canada and Belgium are not far behind. In these terms Austria, Norway and Italy are comparable. *(continued on page 34)*

1. THE ABSOLUTE AMOUNT OF RESOURCES DEVOTED TO RESEARCH AND DEVELOPMENT IN OECD COUNTRIES

COUNTRY and YEAR			Gross National Expenditures on Research and Development		Scientists, Eng. and Technicians on R + D
			In million NC (national currency)	in \$ million (at official exchange rates)	Number in full-time equivalent
USA 1963/64			21,075 ⁽¹⁾	21,075 ⁽¹⁾	696,500 ⁽¹⁾
SIZEABLE INDUSTRIALISED COUNTRIES	France	1963	6,414	1,299	85,430
	Germany	1964	5,745	1,436	105,010 ⁽¹⁾
	Italy	1963	181,729	291	30,280
	Japan	1963	321,128	892	187,080 ⁽⁴⁾
	UK	1964/65	771	2,160	159,540 ⁽¹⁾ ⁽³⁾
SMALLER INDUSTRIALISED COUNTRIES	Austria	1963	603	23	3,220
	Belgium	1963	6,842	137	15,600
	Canada	1963	460	425	23,850 ⁽¹⁾
	Netherlands	1964	1,196	330	31,310
	Norway	1963	303	42	3,820
	Sweden	1964	1,332	257	16,530
DEVELOPING COUNTRIES	Greece	1964	238	8	1,260
	Ireland	1963	4	10	1,670
	Portugal	1964	266	9	2,230
	Spain	1964	1,862	31	6,480
	Turkey	1962	247	27	• •
Common Market			-	3,493	267,630
Europe ⁽²⁾			-	6,260	467,380

(1) Includes an element of OECD estimation.

(2) Includes estimates for major European international organisations.

(3) Working mainly on R and D.

(4) Not in full-time equivalent.

2. R AND D EFFORTS RELATED TO NATIONAL RESOURCES IN OECD MEMBER COUNTRIES

COUNTRY AND YEAR			GERD/GNP ⁽¹⁾ (at market price) %	QSE + Technicians Population No. per 10,000	GERD Population \$ (official ex- change rates)
USA 1963/64			3.4 ⁽²⁾	35.8 ⁽²⁾	110.5 ⁽²⁾
SIZEABLE INDUSTRIALISED COUNTRIES	UK 1964/65		2.3	29.4 ⁽²⁾	39.8
	France 1963		1.6	17.9	27.1
	Germany 1964		1.4	18.0 ⁽²⁾	24.6
	Japan 1963		1.4	19.5	9.3
	Italy 1963		0.6	6.0	5.7
SMALLER INDUSTRIALISED COUNTRIES	Netherlands 1964		1.9	25.8	27.2
	Sweden 1964		1.5	21.6	33.5
	Canada 1963		1.1	12.6 ⁽²⁾	22.5
	Belgium 1963		1.0	16.8	14.7
	Norway 1963		0.7	10.4	11.5
	Austria 1963		0.3	4.5	3.2
DEVELOPING COUNTRIES	Ireland 1963		0.5	5.9	3.5
	Portugal 1964		0.2	2.4	1.0
	Spain 1964		0.2	1.5	0.9
	Greece 1964		0.2	1.5	0.9

(1) Based on OECD GNP figures.

(2) Including an element of OECD estimation.

Of the developing countries only Ireland devotes 0.5 per cent of GNP to R and D and employs more than five QSE, plus technicians, per 10,000 population. In all these countries the expenditures on R and D per capita of population is, as might be expected, very low.

Basic Research, Applied Research, Development

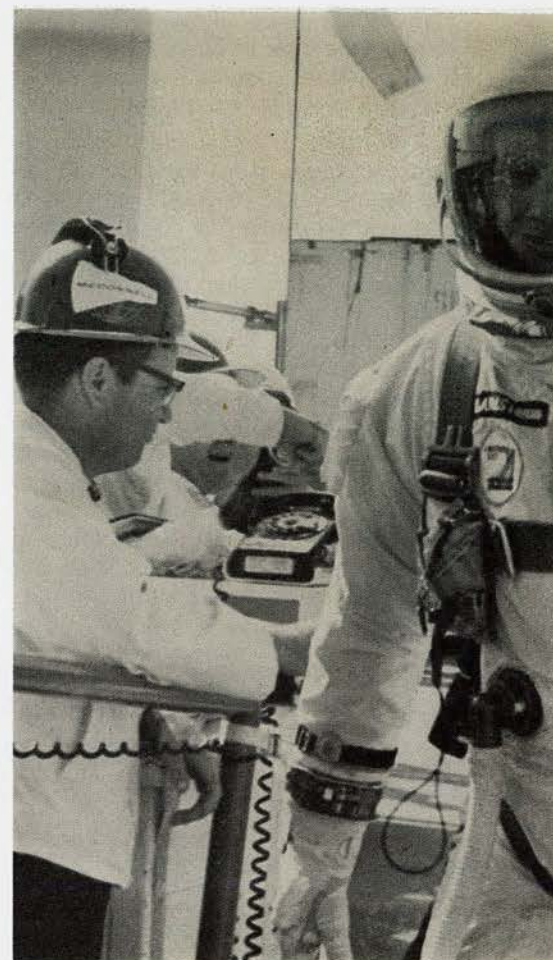
The term "R and D" covers a whole gamut of activities ranging from research devoted exclusively to the disinterested pursuit of knowledge to work designed to improve existing products and processes. Three stages are normally identified: basic research, applied research and development. Basic research is proportionately more important in the developing and smaller industrialised countries (except Ireland). In all the industrialised countries except

Belgium development is more important than applied research, especially in the UK and the USA.

National R and D Objectives

Whilst a certain proportion of a country's R and D effort is undertaken purely for the advancement of science, much is financed as a means to more practical ends. A large share of the efforts of several OECD Member countries is devoted to improving defence capabilities, exploring space and improving knowledge and use of atomic energy. Two-thirds of all US R and D is financed for these purposes. Atomic, space and defence R and D absorb between one third and one half of GERD in France, UK and Sweden and about a quarter in Canada and Greece.

In the remaining countries the largest share of expenditure goes to R and D undertaken in order to

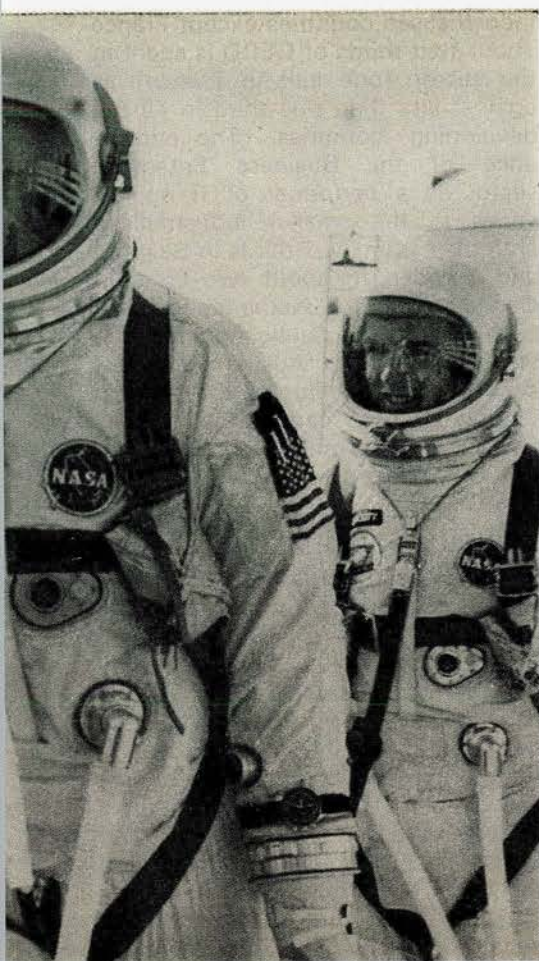


increase the *economic* potentialities of the country, especially in Belgium, Japan, the Netherlands and Ireland.

In most countries a certain percentage of national efforts go to R and D to improve the health and welfare of the nation. In addition, some research, particularly in universities and institutes, is undertaken without any specific objective. These two types of R and D are not always easily identifiable; variations in their apparent share of GERD as at present measured are too influenced by comparability difficulties to be meaningfully discussed.

At present the data does not justify comparisons of the absolute amounts spent on each objective between individual Member countries. It might, however, be suggested that at official exchange rates the United States spends seven times as much on defence, space and nuclear R and D as Europe and 12 times as much as the Common Market, but only twice as much on economically oriented R and D as Europe and three times as much as the Common Market.

Defence, space and atomic energy are largely the reserves of govern-



ment whilst the promotion of the economic potential of most industrialised Member countries lies with the private sector. This balance of interests is made clear if we examine the *source* of funds for R and D in the various countries.

Source of Funds

Government is most important as a source of funds in those countries where there is a large scale promotion of defence, space and atomic R and D (USA, France, United Kingdom, Canada and to a lesser extent Sweden). It also finances a large share of GERD in countries where, in the absence of a strong independent private sector, government has itself to promote "economic" R and D (the developing countries) and where the economy is centred on industries traditionally supported by government such as agriculture, fisheries and exploitation of natural resources (e.g. Norway). In other countries, notably Belgium, Netherlands and Japan, R and D financed by industry makes up the largest share of GERD.

Sector of Performance

R and D financed by private sources is largely undertaken within the business enterprise sector, which includes private industry, research associations, and public enterprises. Where government financed R and D is performed depends on the R and D objectives, the institutional possibilities and the economic philosophy of the country concerned. The overall breakdown by sectors of performance may also be affected by the method of classifying institutes particularly at the border of Government, Higher Education and Private non-Profit.

In the developing countries R and D efforts are concentrated in the government sector. The highest proportions of R and D performed in the government sector in industrialised countries are found in France and Canada and the smallest in Germany and the Netherlands, where, conversely, the Private non-Profit sector is significant. It should be mentioned that the latter sector includes TNO institutes in the Netherlands and two important atomic research centres and also the Max-Planck institutes in Germany. In Austria the transfer of an Atomic Energy Institute from Business Enterprise would raise the government share from 9 to about 20 per cent. *(continued on page 36)*

3. BASIC RESEARCH, APPLIED RESEARCH AND DEVELOPMENT ON A PERCENTAGE OF TOTAL NATIONAL R AND D EFFORTS

COUNTRY	Basic Research Applied Research Development		
United States	12.4	22.1	65.5
SIZEABLE INDUSTRIALISED COUNTRIES			
United Kingdom	12.5	26.1	61.4
France	17.3 ⁽¹⁾	33.9 ⁽¹⁾	48.8
Italy	18.6	39.9	41.5
SMALLER INDUSTRIALISED COUNTRIES			
Belgium	20.9	41.2	37.9
Norway	22.2	34.6	43.2
Austria	22.6	31.9	45.5
DEVELOPING COUNTRIES			
Ireland	3.5	53.1	43.4
Portugal	Not available.		
Spain	25.4	48.1	26.5
Greece	23.8	53.2	23.0

(1) Includes an element of OECD estimation.

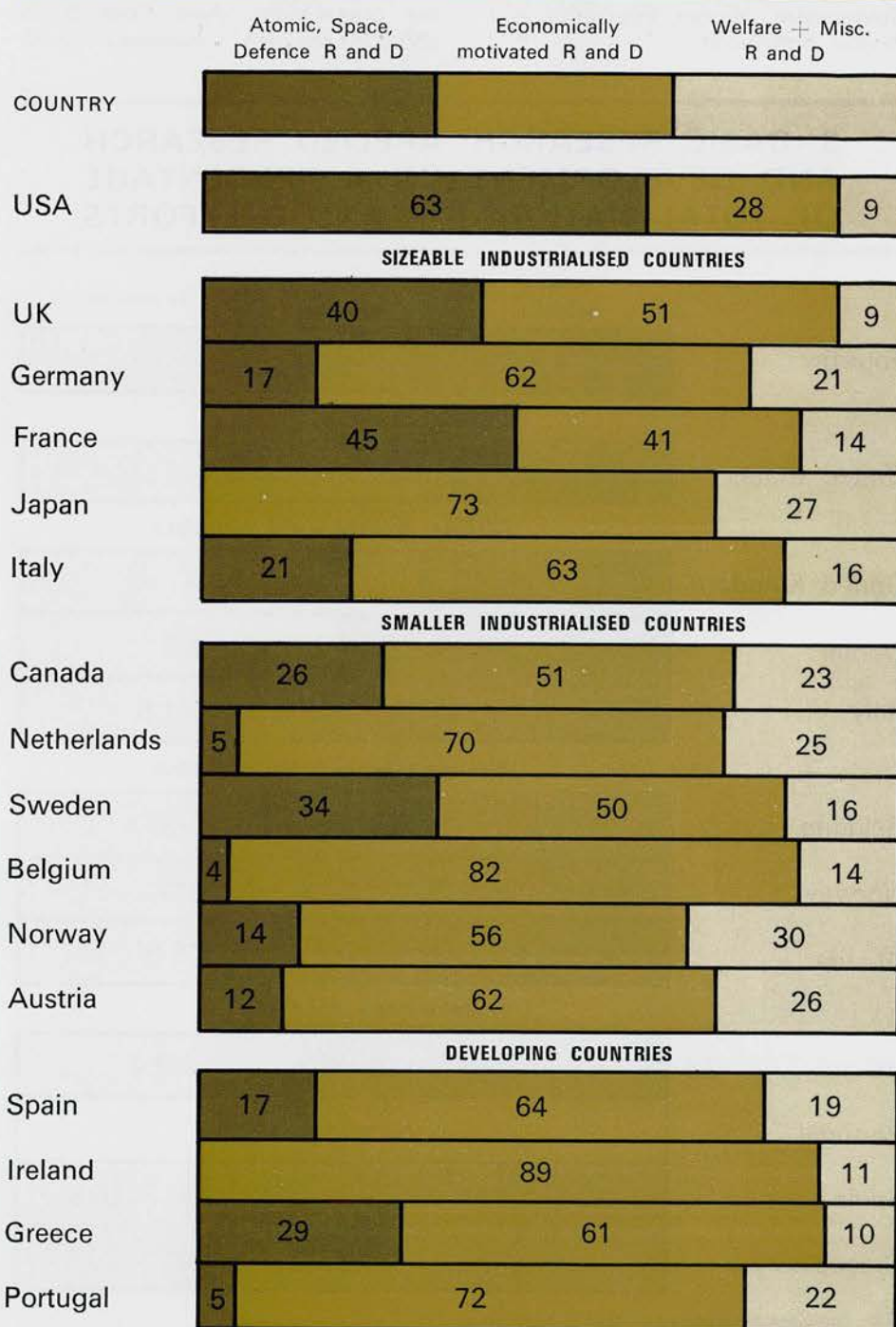
The Higher Education sector, whose R and D activities are largely directly or indirectly government financed, performs a relatively small share of GERD in the USA, UK, France, Canada and Sweden, but a more important one in Germany, the Netherlands and Japan and in Austria, Belgium and Norway. In developing

countries universities spend a small share of GERD, but employ a significant proportion of all qualified scientists and engineers engaged in R and D.

In the USA and in the sizeable industrialised countries R and D efforts are concentrated in the Business Enterprise sector. In all the sizeable

industrialised countries except France about two-thirds of GERD is spent in the sector (one half in France) as against less than one-third in all the developing countries. The importance of the Business Enterprise sector as a performer of R and D varies in the smaller industrialised countries from two-thirds in Belgium and Sweden to about two-fifths in Canada, with the Netherlands, Norway and Austria falling between the two extremes. (In Austria the omission from the sector of the Atomic Energy Institute causes the proportion to drop to one half.)

4. PERCENTAGE ALLOCATION OF NATIONAL R and D RESOURCES BETWEEN DIFFERENT RESEARCH OBJECTIVES



Number and Size of Firms Undertaking R and D

According to the data submitted for the Statistical Year, R and D activities in the Business Enterprise sector are heavily concentrated in firms employing more than 1,000 persons and in the USA even in firms employing 5,000 and over. R and D is, thus, a highly concentrated activity. The four top companies (in terms of R and D expenditure) account for over 20 per cent of industrial R and D in all the countries studied. In the smaller industrialised nations this figure reaches 30 to 40 per cent, and even 60 per cent in the Netherlands. The lowest concentration is to be found in the United States and the sizeable industrialised countries.

Western European firms' R and D programmes, generally speaking, are at least ten times smaller than American programmes (for UK, France, Sweden and Belgium) and a hundred times smaller for the other countries (Norway, Austria, Spain). It should not be forgotten, however, that two or three firms have R and D programmes worth over \$100 million in Germany and in the UK and that there is also a Dutch firm which is probably in this category. The use of an R and D exchange rate would reduce the difference between US and European firms.

Selected Industries

A large share of all Business Enterprise R and D is concentrated in three groups of industry, Chemicals (including drugs and petroleum pro-

5. GROSS NATIONAL EXPENDITURE ON R AND D ANALYSED BY SECTOR OF PERFORMANCE AND BY SOURCE OF FUNDS (in percentage)

COUNTRY AND YEAR			Sector of Source of Funds					Sector of Performance			
			Business Enterprise	Govt.	PNP	Higher Education	Abroad	Business Enterprise	Govt.	PNP	Higher Education
USA 1963			32	64	1	1	2(a)	67	18	3	12
SIZEABLE INDUSTRIALISED COUNTRIES	France	1963	33	64	n.a.	-	3	51	38	n.a.	11
	Germany	1964	57	41	1	-	1	66	3	11	20
	Italy	1963	62	33	-	4	1	63	23	-	14
	Japan	1963	65	28	3	4	-	65	12	4	19
	UK	1964/65	42	54	1	n.a.	3	67	25	1	7
SMALLER INDUSTRIALISED COUNTRIES	Austria	1963	55	40	2	-	3	64	9	1	26
	Belgium	1963	71	24	-	-	4	69	10	1	20
	Canada	1963	34	55	1	7	3	41	43	2	14
	Netherlands	1964	54	40	3	-	3	56	3	21	20
	Norway	1963	38	54	2	1	5	52	21	2	25
	Sweden	1964	49	48	1	1	1	67	15	n.a.	18
DEVELOPING COUNTRIES	Greece	1964	16	82	1	-	1	16	74	1	9
	Ireland	1963	29	67	1	-	3	29	56	4	11
	Portugal	1963	21	70	6	2	1	22	66	5	7
	Spain	1963	26	74	-	-	n.a.	25	69	-	6

(a) Not funds from abroad but from unspecified domestic sources.

ducts), Electrical (electrical machinery, electronics and in the case of the USA, and Italy, communications) and Aircraft. The only countries in which these industries perform less than half of all Business Enterprise R and D are Italy, Austria, Norway and the developing countries.

R and D in the aircraft industry is always heavily supported by government, especially in the USA, UK and France, but slightly less so in Sweden and Canada. In the USA over half the R and D activity of the electrical industry is government financed as opposed to about one quarter to one half in the UK, France, Canada, and Sweden. The level is below 10 per cent in all other reporting Member countries' R and D. The chemical group of industries is predominantly privately financed, the highest support level by far being 16 per cent in the USA.

Perhaps the most reliable absolute measure of R and D activity in

the selected industries is the number of qualified scientists, engineers and technicians employed (expressed in full-time equivalent). There is a great variation in the number, employed in the aircraft industry. For electrical three sizeable industrialised countries, Japan, UK and Germany each employ about 30,000 QSE and technicians, followed by France with 16,000 and Italy with 5,000. Canada and Sweden are the heaviest employers of the smaller industrialised countries. Of the remaining countries only Belgium employs a number approaching 1,000 of QSE and technicians. The Western European electrical industries employ the equivalent of about 70 per cent of the number of QSE and technicians employed in the USA and the Common Market industries 40 per cent.

Japan is the heaviest employer of the sizeable industrialised countries in the chemical group with 32,000 QSE and technicians, follow-

ed by the UK and Germany with 20,000 and then France and Italy. The range in the smaller industrialised countries runs from 3,000 in the Netherlands to 300 in Norway and is the developing countries from 200 in Portugal to 35 in Ireland. The European countries together employ the equivalent of slightly more than 80 per cent of the number of R and D QSE and technicians employed the US chemical group and the EEC 50 per cent.



The short descriptions of the roles of this and other sectors given in this article have shown only the most salient features of their R and D efforts. Each sector will be the subject of a detailed analysis to be published individually in the Statistical Year series, probably in the following order: Business Enterprise sector, Government sector, Private non-Profit sector and Higher Education sector.

RESOURCES AND ACTIVITIES IN DEVELOPMENT AID OF NON-GOVERNMENT, NON-PROFIT ORGANISATIONS

Private aid provided or administered by non-governmental, non-profit organisations plays a large part in the total assistance effort for the benefit of developing countries. As part of its concern to keep the aid effort under review the OECD's Development Assistance Committee has agreed that a Directory (1) of these organisations should be published in collaboration with the International Council of Voluntary Agencies (ICVA). In a previous article (2) Edwin Eggins, an OECD Consultant (Development Department) has discussed the background and purposes of the Directory. In the present article he deals with questions of the resources available to these organisations and how they are, or could be, employed.

(1) "OECD/ICVA Directory : Development Aid of Non-Governmental, Non-Profit Organisations".

(2) *OECD Observer*, No 27, April 1967.

The material gathered for the OECD/ICVA Directory, while it may be considered to cover adequately the wide range of organisations providing aid, is not exhaustive (1). Nevertheless, the results revealed may be regarded as largely indicative of the general state of affairs.

The non-governmental organisations (NGOs) covered are those based in the following countries : Australia, Austria, Belgium, Canada, Denmark, France, Germany, Ireland, Italy, Japan, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, and the United Kingdom. In addition, all members of the International Council of Voluntary Agencies, including those in the United States, are covered, making a grand total of some 1,500 organisations, 500 of these being religious Mission Orders whose particulars were supplied in tabular form. It did not prove possible to obtain detailed expenditure figures for this last group, but most other organisations provided estimates.

It is estimated that, in cash and kind, the 1,000 organisations providing expenditure figures account for an annual aid expenditure of over \$750 million. Since a mere 5 % in number of United States organisations are covered and since Missions are known to spend sizeable sums in helping the developing countries, it would be reasonable to suppose that the total figure must be in excess of \$1 billion a year.

United States based organisations account for more

than half of this amount. Following next are NGOs in France, Germany and the United Kingdom; the annual aid expenditure of organisations in each of these countries may be estimated at \$50 - \$100 million. Their combined expenditures represent well over half the total NGO expenditure of Western European countries, among which the expenditures of organisations in Belgium, the Netherlands, Sweden and Switzerland, at between \$6 million and \$12 million a year in each case, are also prominent. Outside Europe, Canada's contribution of some \$25 million is important and CORSO (a member of ICVA), the single New Zealand organisation covered by the survey, accounts for \$4 million. The NGOs of each of the other countries covered spend between \$1½ million and \$3½ million annually.

The leading group in per capita contributions includes Canada, Germany, Sweden, Switzerland and the United States. On a per capita basis, organisations in a number of the smaller countries can be said to make a useful contribution to NGO aid activity.

Not all NGO income is derived from private sources.

(1) US organisations are listed in the "Directory of US Non-Profit Organisations participating in Technical Assistance Abroad". Technical Assistance Information Clearing House (TAICH) of the American Council of Voluntary Agencies for Foreign Service Inc., New York 1964 and supplements 1965 and 1966.

Nor may valid comparisons be drawn by adding their total expenditure to normal official aid. The figures quoted above should be taken as estimates of funds flowing *through* rather than entirely *from* the NGOs. Thus, out of 68 organisations spending over \$1 million a year on aid, 27 receive half or more of their income from public funds. While such organisations are classified as non-governmental there is room for considerable difference of opinion about their precise nature. Figures for the United States, in particular, are complicated by the fact that large quantities of government-stocked foodstuffs have been channelled through some of the biggest NGOs under the Food for Peace Programme.

LEADING CONTRIBUTORS OF AID

The table annexed lists, by categories, the kinds of organisations in the participating countries which are the leading contributors of aid. There is some overlapping among categories, but they may serve to indicate orders of magnitude. Although only nine organisations for Youth and for Volunteers appear in the table, eighty-four are shown in the Directory. Ten of these are international in their composition and the remainder are shared among most of the participant countries. The field of Volunteers is prominent among those in which governments and NGOs already come together regularly and to which both are paying increasing attention.

Excluding those Mission Orders for which only tabular details are available, 60,000 persons are shown to be in paid regular employment on NGO aid activity; 40,000 of them are working abroad. The figures may be regarded as a minimum, since figures for many organisations which were unable to distinguish between aid and other staff are not included.

NGO activity cannot be measured simply in terms of money spent or staff employed. There is much voluntary (unpaid or minimally paid) effort in NGO work, mainly by missionaries or voluntary helpers of various kinds. There are large numbers of locally paid workers in the developing countries about whom no details are given in simple descriptions of NGO activity, and whose wages are met locally in one way or another. There is also, as a rule, great flexibility of action in operations and financing; this may make for a more economical use of resources than is sometimes possible in official activity. Especially among NGOs of the kind usually known as voluntary agencies, the response is generally to personal needs and it is generated at a personal level; in these circumstances, the activity seldom involves a large cash expenditure but its value can nonetheless be high. Many organisations are central bodies receiving contributions from local supporters which are often gathered in small amounts from tens of thousands of people.

NGOs have different inspirations. These can, for example, be religious, political, ethnic, social, cultural, charitable, academic, professional, or have to do with business, labour, men, women, youth or children. Many have more than one basis (say, an association of women with particular religious, academic and professional attributes) and the structures often have special national and international backgrounds. It is not rare to find



Training, with modern equipment, is a major part of NGOs' aid activity.

parallel organisations with but a single differing ingredient, often religious or political—for example, Protestant or Catholic organisations for the welfare of overseas students.

From the points of view of both donor and recipient governments and, even, to some extent, of NGOs themselves, the situation which arises from these and other similar proliferations is sometimes confusing; but drastic attempts at remedies could be self-defeating. The tradition of voluntary activity is that it represents an individual response to a need. There may, however, be a need for rationalisation and the subject is discussed later.

When the material for the Directory was being gathered, it was made clear that a broad interpretation was being given to "development aid" and that it included activity at home as well as abroad. Many NGOs give more than one kind of aid. Most of the organisations are engaged in some form of technical assistance, that is, the process of transferring knowledge and skills by means of staff or equipment. Nearly half of them, additionally, raise funds or give financial aid. One-

sixth or so of the total furnish material aid in the way of supplies of various sorts, including foodstuffs, technical equipment, medicines and clothing, while a smaller number are co-ordinating bodies or deal with other subjects, including refugees and migrants and the provision of emergency relief (for example, following natural disasters).

The large majority of these activities take place in the developing countries. Activity at home relates mainly to various forms of training, to the recruitment of Volunteers and other types of staff and to social services (for example, student hostels) for people from developing countries. In terms of numbers, there appears to be greater concentration on NGO technical assistance

activities in the home countries (as opposed to services abroad) by organisations in France, Italy and Spain.

FIELDS OF VOLUNTARY AID

Training and Education are fields in which over half the organisations are involved. The term "training" covers for the most part vocational training including — in addition to courses for artisans and craftsmen — training in agricultural skills, nursing, midwifery, first aid and social welfare; it also includes orientation courses

	Missions and other religious	Other (secular)	Trade Unions	Co-operatives	Foundations	Youth & Volunteers	Institutes	Professional Associations
Australia	3	6				I		
Austria	6	I				I	I	I
Belgium	2	4	I			I	I	I
Canada	6	3				I		
Denmark	4	6						
France	3	2				I	6	I
Germany	6	8				I		
Ireland	8	2						
Italy	2	4				I	3	
Japan		4		I				5
Luxembourg	I	I						
Netherlands	3	2			2		2	
Norway	7	I	I	I				
Portugal		I						
Spain	2	3					5	
Sweden	6	2	I	I				
Switzerland	5	4			I			
United Kingdom	4	6			I	I		
United States (ICVA members)	6	4						
International organisations	5	2	I			I		I
TOTAL	76	66	4	3	4	9	18	9

for personnel going abroad on aid assignments, training at professional level (doctors, teachers, engineers) and seminars of various sorts. It is apparent that NGOs are fully aware of the urgent need for lower and middle-level training in the developing countries and of the desirability of building up local skills rather than superimposing foreign ones.

Education is traditionally a field for Missions. Closer and more detailed examination would be needed to establish the present position with precision, but it is common knowledge that there has been some modification or curtailment of their activities, with a consequent change in the pattern. The material indicates, however, that there is still a thriving Mission activity in education at all levels. Much of the activity is at primary level, but there are also many secondary schools and some institutes of higher education supported and staffed by missionaries. Increasing support at the higher levels is given by other organisations, notably Foundations and those concerned with the sending of Volunteers.

The field of Social Services, including Community Development and Resettlement of Refugees, is the next most important in NGO activity, followed by Health and, to a less marked extent, by Agriculture. The only other fields of importance numerically are Material and Emergency Aid and Construction and Engineering, but Co-operatives and Credit Unions, Communications and Transport, and Industry also have some prominence.

The appearance of Material and Emergency Aid among the leading activities reflects the traditions of NGOs in giving help in kind and in responding to distress situations. Apart from the large amounts of food distributed by United States/ICVA NGOs under the Government's Food for Peace programme, international organisations (notably the Red Cross), religious, secular, women's and youth organisations, and trade union and co-operative movements distribute supplies and equipment in varying amounts.

GEOGRAPHICAL DISTRIBUTION

Africa attracts most NGO activity, followed by Asia and, in almost equal numbers, Latin America (including the Caribbean area) and finally, Oceania. Every developing country of these regions has at least one NGO working in or for it. Many have a very large numbers of such organisations, notably in Africa : Tanzania, Nigeria, Congo (Kinshasa), Algeria, Kenya; in Asia : India, Pakistan; in Latin America : Brazil.

While there is a natural tendency for French-speaking organisations to concentrate on francophone regions and English on anglophone, in some areas (among them Algeria, Congo (Kinshasa), Rwanda and Burundi) the non-governmental organisations are mixed.

Just as some NGOs specialise in certain fields of aid, so some concentrate specifically on certain countries. Refugee situations also provide focal points for NGO activity and offer opportunities for close co-operation among organisations and between them and governments (in both donor and recipient countries).

Most NGOs unfailingly insist on the participation, as partners, of counterpart organisations in the developing countries. Those organisations, as their names imply,

are an integral component of the whole structure.

Co-operation among NGOs exists already in good measure and its desirability is well realised by most NGOs. There are, however, many practical difficulties related to the widely varying nature and objectives of NGOs. In a number of OECD Member countries, groupings of NGOs have been formed to improve consultation and co-operation; but they do not generally seek to exercise a directing authority on the programmes of their members. Exceptions are some of the bodies which are formed with an express purpose of directing the activities of organisations connected hierarchically, or bodies drawing funds from only one source; as respective examples, a Board of Missions or a body formed to allocate official grants. Even these exceptions are limited to the extent required by the particular activity being co-ordinated. Nor do the consultative groupings mentioned above cover all NGOs of the same type.

The scale and level of NGO activity is such that it is difficult to see any significant advantage in a mandatory form of co-ordination. The main requirements appear to be for better consultation and mutual exchange of information. There is not the same apparent need as in much bigger programmes for harmonisation with Development Plans, once account has been taken of the general lines of a developing country's policy. There is plenty of room for all the NGOs in most fields in the developing countries, but improved means of information and consultation among NGOs would help avoid physical overlap of activity and over-concentration on certain areas and subjects.

Given a reasonable degree of goodwill by the NGOs, the means which are lacking for co-ordination are basically financial but also, in part, administrative. Adequate staff, accommodation and equipment are required, together with some streamlining and standardisation of procedures, and the setting-up of structures for the rapid inflow and outflow of information.

There is also scope for valid and useful sharing of responsibility, at national and international level, among NGOs and between NGOs and governmental organisations. At national level, NGOs could seek means for a better exchange of information and machinery for rapid consultation, and governments could further help and encourage them to do so, by securing closer co-operation and mutual comprehension.

ICVA is making arrangements for the Directory information to be kept up-to-date. For this purpose, clearing-house machinery is being established. It could be structured to receive information from the different national organisations (ideally from one central organisation in each country), process it and feed it back to each country in suitable form. Intergovernmental organisations could co-operate, especially through the use of expert staff and, eventually, mechanical processes.

Other suggestions which might also be examined include the question of tax treatment of NGOs and the possibility (with the co-operation in some instances of private industry) of channelling a wider range of supplies in kind (commodities, equipment) through them. There is something also to be said for greater specialisations by NGOs : overlapping would be avoided and it should become easier for them to keep up with the current rapid pace of change. Professional associations could look beyond national boundaries and interests and could extend help to colleagues in developing countries.

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