the

OECD OBSERVER

LITTLE KNOWN ASPECTS OF INDUSTRIAL
RESEARCH. THE WORKINGS OF ACTIVE
MANPOWER POLICY. A UNIQUE METHOD
N PLANNING STRATEGY FOR EDUCATION
GRICULTURE IN A GROWING ECONOMY
ROSPECTS FOR SCHOOLS TELEVISION

N°8/ FEBRUARY 19

the OECD OBSERVER

Nº 8 FEBRUARY 1964

Published bi-monthly in English and French by
THE ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

EDITORIAL OFFICES
OECD Information Service, Château de la Muette, Paris 16e.

Annual Subscription Rates : F 10.00, FS 10.00, DM 8.30, 15 s., $ 2.50.
Single copies : F 2.00, FS 2.00, DM 1.70, 3 s., $ 0.50.

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PHOTOS : Cover : Almasy; Page 5 : Sture Ryman; Page 9 : BBC Photo; Page 10 : D. Lajoux - Unesco; Page 16 : Ulrich Zimmermann ; Pages 18, 24, 25 : Robert Mottar - OECD; Page 29 : NATO Photo; Pages 30, 33 : Almasy; Page 37 : Warren Spring Laboratory, U.K.; Page 39 : Willy Ronis - Unesco; Page 40 : Ellenika Photographika Epikaira, Athens (left), Photo Openbare Werken, Rotterdam (right).

CONTENTS

THE WORKINGS OF AN ACTIVE MANPOWER POLICY

Manpower policies to promote growth and full employment are assuming increasing importance in OECD countries. An active manpower policy brings jobs to the workers in labour surplus areas, helps people of all ages to train or retrain for new occupations, or to move to places with better employment opportunities. The Manpower and Social Affairs Committee of OECD has embarked upon a series of country studies to clarify what the Members are doing in this field and to stimulate further improvement. The following article discusses the first of these studies, which has just been published.

For the first time, the way in which government manpower policies and practices are being used to promote economic objectives has been subjected to systematic and comprehensive country-by-country examination.

Under the auspices of the OECD, experts in the field of manpower policy visit the country being examined, make an on-the-spot study of this very important but often neglected aspect of economic policy and write a report setting forth their findings — positive and negative — and drawing up questions which serve as a basis for discussion in the OECD Committee for Manpower and Social Affairs.

A background report is provided by the government of the country. After one or two rounds of discussion in the Committee a third report — with conclusions and possible recommendations — is worked out and further scrutinised by the Committee. The fact that this is done co-operatively between the Secretariat, the experts and the specific country's own authorities does not preclude frank criticism and advice. The raison-d'être of the whole exercise is both to stimulate the country studied to improve its policies and practices and to let its successes and failures, its positive and negative experiences, serve as a possible guide for governments and public opinion in all other countries.

Reports have now been published on Sweden and the United States. Studies of Greece, Italy, Austria and Canada are in various stages of progress.

Sweden was chosen as the subject of the first study because it has had a consistently high level of employment since the war and because the Swedish authorities have, in addition to the traditional fiscal and monetary policy tools, used manpower policy in a particularly active way to maintain this full employment and to promote economic growth.

In order to show the context within which Swedish manpower authorities operate, the study sets forth the philosophy that governs their actions :

" There is a strong consensus of opinion among all political parties in Sweden that it is a central duty of

the government to pursue the goal of full employment. This goal is given outstanding priority for both social and economic reasons. Consequently economic policy is closely geared to the employment prospects which are incessantly watched in great detail...

" A non-inflationary full-employment economy cannot be maintained by general fiscal and monetary means only. To create, by these means alone, a level of demand high enough to eliminate all unemployment will unavoidably result in an intolerable overstrain of resources in broad sectors. A less inflationary level of overall demand will instead involve tendencies towards unemployment in some sectors and still mean excess demand in others. These partial imperfections have to be counteracted by a set of selective measures : on the one hand various stimuli towards occupational and geographical mobility of the labour force so that the most expansive and productive industries can grow more rapidly; on the other hand job creation in surplus areas where an additional demand for labour can be established without resulting in overstrain.

" These measures are not to be regarded as makeshifts in an emergency but as permanent elements of economic policy aiming at a rate of growth high enough continually to absorb the whole labour force without utilisation of self-destructive inflationary stimuli or protection of sectors with low productivity. They have to be implemented on a sufficiently large scale by a manpower policy administration entrusted with substantial financial and legal powers. The task of this administration will be equally important when external conditions promote a high level of economic activity as when recessionary tendencies prevail. "

One of the most striking features of Swedish manpower policy is the extent to which various manpower agencies and services are welded into a single organisation which covers all areas of the country and is concerned with a very wide range of functions having to do with manpower : gathering information about the labour force; forecasting employment trends; promoting geographic and occupational mobility of manpower; maximising the available labour force; evening out seasonal and cyclical changes in the demand for labour; influencing the location of industry; coordinating other central and local government agencies' planning of public works, including emergency works; supervising unemployment insurance schemes; providing cash relief to the uninsured unemployed; and controlling the entry of foreign workers.

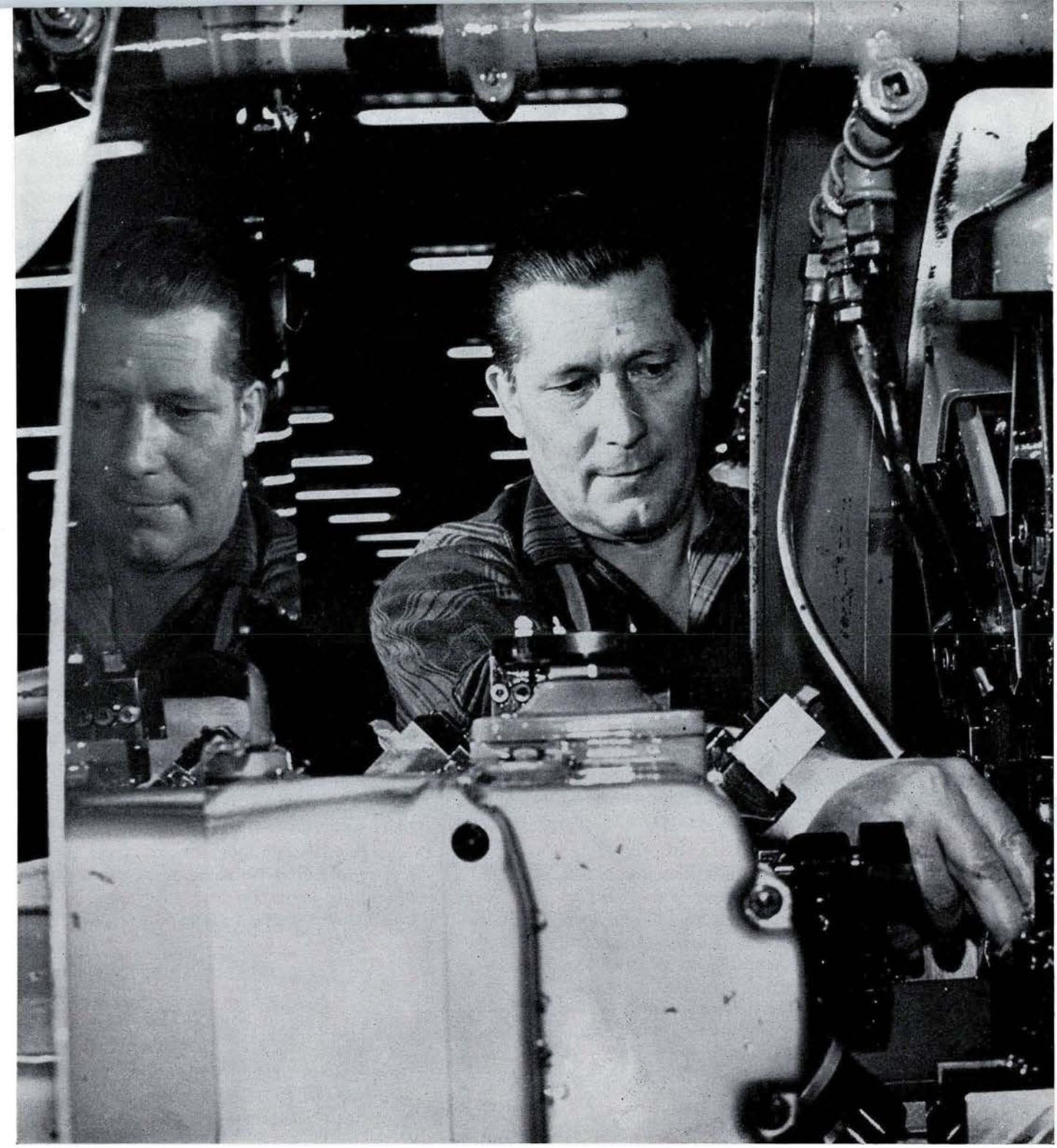
In addition to its formal duties this central manpower authority brings its influence to bear on employment matters through discussions with trade unions, employers, educational authorities and other groups. It is a strong and independent body, composed not only of government officials but of labour and management representatives as well. Under the central Labour Market Board are 25 county Labour Boards with a similar composition. There are 250 employment offices (whose central task is placement) and under them about 400 local representatives. These serve all sorts of manpower groups; there are special placement services for technicians, teachers and other white-collar employees which have recently been greatly enlarged in accordance with demands of the trade unions representing these groups.

The range of instruments at the disposal of the Swedish labour market authorities is varied and has been substantially widened in recent years.

Of the greatest importance for encouraging workers to move from a labour surplus area to regions where work is available, is, first, of all, the employment exchange service which provides nation-wide information about job vacancies. In recent years the service (which is practically alone in this field as private fee-demanding agencies are forbididen in accordance with the International Labour Organisation Convention), has been placing some 900,000 workers a year, 70,000 outside their own county. Migration to labour-short areas has been encouraged by several kinds of financial incentive, some of which are traditional in Sweden, some very recent. Allowances are given for travel, for transport of furniture and for the maintenance of two households during a transition period of up to nine months. In 1959 a grant for " starting help " was initiated which now amounts to $ 100, provided the new job is held for at least half a year; in 1962 the government initiated an " installation allowance " which can amount to the equivalent of $ 400 for workers with families who move out of areas which have an exceptionally high rate of unemployment, in particular five northern provinces where unemployment in 1963 was two or three times higher than the 1.5 per cent of the labour force recorded in the rest of the country.

These various forms of financial assistance to geographical mobility are now granted in some 15,000 cases annually as against 2,000 in 1957/58 when a " new labour market policy " was introduced. The benefits given in each case are also much improved. The total expenditure is, however, relatively limited, less than $ 2 million a year.

Increasing weight is being given in the Swedish manpower programme to occupational mobility and to retraining as a means of achieving that mobility. Before 1958 less than a thousand people a year received some form of retraining at government expense. Since



In Sweden, public retraining courses have been organised. This picture is from the National Labour Market Board film "Investment in Manpower".

then the number has increased to 30,000 or almost one per cent of the work force. A course lasts from two weeks to two years; the average is some five months. Practically all the participants have, within a short period, got jobs, usually, of course, in the occupations for which they were trained.

Originally a programme mainly for the handicapped unemployed, the scheme has been widened to make eligible all unemployed persons and also certain other categories (e.g. workers who are over fifty years old and who expect to have some difficulty in keeping their jobs; or workers employed in a firm that is about to close down). Moreover, training is given to those whom the government wants to encourage to join the labour force (housewives in particular), or to leave the farm for industry. Participants are of all working ages; in October 1962, about 15 per cent were over 45 years old.

The subsistence allowance paid to an unemployed person who accepts retraining is higher than he would receive in the form of unemployment insurance. For some heads of household it may come to over 80 per cent of the working wage.

(Continued on page 6).

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As to the demand for workers, manpower policy is used in a selective way to supplement fiscal and monetary measures. The traditional tool in this context is public works; and it is this aspect of manpower policy which still accounts for the largest governmental expenditure — $ 43 million in 1963.

Public construction works have been used not only to provide jobs during a recession but also, especially during recent years, to take up the winter slack in the construction industry. Two-thirds of the funds used to finance emergency works in the last few years have gone for road construction, most of the rest for building homes and schools.

Advance planning is considered the key to a successful public works programme. The Labour Market Board coordinates and supervises the planning of public and publicly assisted works, the actual planning being carried out in the various specialised agencies of central and local government. Each year the Board presents to the government a list of projects that can be started at short notice. In some cases, the Board will pay half the cost if a city undertakes to plan its projects (chiefly water and drainage works) in advance.

The Labour Market Board also participates in making decisions about the timing and volume of government purchases and the use of tax incentives to influence the volume of private investment (1).

Another line in manpower policy is to encourage industry to locate in areas where there is a manpower surplus. In this connection, the Labour Market Board has a service which provides information about such localities to prospective investors. Further measures are being discussed : in September 1963 a Royal Commission on Location of Industries proposed a number of inducements — special credit facilities, subsidies for building factories and training new workers, for example for firms that wish to start or enlarge plants in areas whose industry is one-sided or not fully developed.

Swedish manpower policy is also concerned with fully utilising domestic manpower potential. The Government hopes to have a production growth of 4 per cent a year during the present decade. Assuming an improvement in productivity amounting to 3.3 per cent a year, such growth estimates imply an increase in the labour force of 0.7 per cent (about 25,000 persons a year) if there is no reduction in working hours. Assumptions behind the latter figure are that net immigration will continue at the present level — roughly 10,000 a year — and that it will be possible to increase the participation of married women in the labour force from the present 40 per cent to 50 per cent. (The participation rate has already increased by 10 per cent during the decade of the 1950's.)

In this connection the Labour Market Board attempts to mobilise what might be called marginal sources of manpower by providing rehabilitation, sheltered employment or work at home for the handicapped and by offering training courses with pay to housewives who want to go back to paid employment.

In order to bring labour supply and demand together, information is needed, and the Labour Market Board devotes considerable effort to projecting labour market trends and to what is called an " advance warning " system. As an example of the kind of information collected, employers have agreed to notify the Board's local employment offices when and if they foresee cutbacks in their work force for any reason.

The authorities are also concerned with the long-term outlook for labour supply and demand and with the projection of future employment patterns. These projections influence the organisation of the vocational education system as well as the vocational guidance service. There are 100 vocational guidance officers attached to the Board's employment exchanges, and in 1962 they gave individual counselling to some 60,000 people. This service is not only for the young : nearly half of those utilising it were adults seeking replacement.

The men who studied the Swedish experience for the OECD — Mr. Mansholt, Director General of the Netherlands Employment Service and Mr. Kirstein, Head of Division in the Danish Ministry of Labour — make observations on a number of subjects including the effectiveness of the investment reserve system, the adequacy of Swedish statistics, the labour content of public works programmes and the organisation of vocational education.

Several of the points they make were taken by the OECD Manpower Committee as the basis for suggestions as to how Swedish manpower policy might be modified and improved. (Most of the matters are already under discussion in Sweden.)

First of all, the Committee, while pointing to the positive fact that immigrants into Sweden, once they have started a job in the country, are given practically the same rights and protection as Swedish workers, concludes that :

(1) The principal mechanism used by the Swedish Government for this purpose is the system of investment reserves described in *The OECD Observer*, December 1963, page 27. The system has been broadened recently so that it affects investment not only in fixed plant and equipment but in stocks of commodities as well, and so that it can be used to influence the location of industry.

" Swedish immigration policy is rather restrictive except for Nordic countries (there is a common labour market between these countries). It seems that certain problems could be more easily solved by immigration than by internal migration. It should also be stressed that increased immigration to Sweden with its high level of productivity would be a contribution to the common growth target of the OECD. "

Secondly, the Committee feels (as does the Swedish Royal Commission on Location of Industry) that intensified measures are needed to influence industry location and to promote more systematic area redevelopment. (Unemployment is still higher in the North of Sweden than in the South.)

As regards the retraining of adults, the report points to the widening of the scope of this programme and to the vast enlargement of activities and observes that " it is especially this strong reinforcement of all measures to improve manpower adaptability that justifies the talk about 'a new labour market policy' in Sweden ". However, the Committee notes that the retraining programme " is still limited to special groups with more or less individual employment difficulties. It is not yet fully developed into an instrument for supplying expanding industries with suitable labour and giving workers in general a better chance of improving their occupational status. In many cases the upgrading through further training of actually employed workers without handicaps would be the best way to open job opportunities to persons with limited capacities. Increased support to training organised by individual employers for such purposes would also seem to be an efficient way of reducing the shortage of skilled labour... Schemes for collective employer financing or clearing of training costs such as exist or are being developed in some other countries have not yet been developed to any large extent in Sweden. "

Moreover, the Committee observes, the adult training programme has until now been mainly concerned with manual skills and relatively simple white-collar occupations whereas technological development demands increased emphasis on more advanced training.

Further efforts to help migrants adjust to their new environment are also recommended. The evidence indicates that workers are having some difficulties in adjustment : a third of those who take jobs in new locations return home after a time.

Finally the Committee notes that the labour market authorities are relatively limited in the means at their disposal for increasing the volume of housing in areas of expanding industry and suggests that they should have more influence in this respect.

In its overall evaluation of the strengths and weaknesses of Swedish manpower policy, the authors of the report conclude in part :

" The clear definition of their employment policy tasks has converted the labour market agencies from passive agents able to serve only limited sectors of the labour market into an organisation which seeks to anticipate the changes in supply and demand for labour on a broad scale and to facilitate the adjustment of individuals and enterprises to oncoming changes. This policy has inspired confidence among workers in the probability of their placement in new jobs after loss of employment and in financial maintenance during the adjustment period. The result has been a greater willingness on the part of trade unions and the people as a whole to support technological and economic changes which will benefit the national economy.

" The success of the policy has been strongly promoted by the continuing support and co-operation of labour and management organisations which are represented on both the national and provincial labour market boards.

" The effectiveness of these programmes has been tried in a period of high activity in surrounding countries with only short recessions. So far, they have served to effect transfers and mobility in modest proportions. Thus the programme and the administration have not yet been tested in situations where the employment problems have acquired very severe forms and proportions.

" To a great extent the active manpower policy represents an effort to prevent more serious difficulties by reducing inflationary pressures which can lead to troublesome setbacks. In the latter respect the programme has not yet obtained such efficiency that inflation could be totally avoided. Even during recent years there has been a continuous price and wage drift in spite of the willingness of Swedish trade unions to keep negotiated wage increases reasonably parallel to the increase of productivity. An even more powerful labour market policy with selective means would have been needed in order to make it possible to apply stronger fiscal and monetary anti-inflationary measures without slowing down the economic activity in the country and the rise in the real standard of living.

" The economic fate of any country, especially a small one highly dependent upon foreign trade, can never be decided only by its own action. The development of technological conditions and trade patterns always involves the possibility that great changes will be called for in the employment structure. Sweden has however embarked upon a policy which deliberately aims at seeking progressive solutions of any employment difficulties, avoiding measures of protection against foreign competition or subsidies to declining sectors as remedies against unemployment. Some of the methods used are new and are still regarded as experimental. The Manpower and Social Affairs Committee notes, however, that the results hitherto achieved have been regarded as so positive by the Swedish Government and Parliament that they still continue to increase the resources devoted to Sweden's programme for an active manpower policy. "

TELEVISION

a revolutionary instrument for development

by Kenneth FAWDRY
Head of BBC Schools Television

FOR the first time in his history man has now the power and the knowledge to inherit the earth. I mean, so to order affairs on this planet that life can be, not for the few but for all, no longer a precarious struggle for existence but a rich opportunity for fulfilment. But as yet that power and that knowledge are in too few hands. The fundamental task of OECD, as of other agencies with similar ideals, is to ensure that they are more rationally used and more widely distributed. Thus an organisation committed to economic development among Member countries is inevitably involved also in helping to satisfy a hunger for education which is world-wide.

More schools, more teachers, better training, better equipment, better means of disseminating knowledge — the cry is universal, and the needs are felt no less acutely in the richer countries, which must lead the way in the search for solution, than in the poorest. Within OECD, they are the special concern of the Directorate for Scientific Affairs; and in the field of science and technology in particular it is not only a question of more people (children and adults) needing training, including retraining of those required to adapt themselves to new jobs, but of an ever-growing body of knowledge to be taught. Every new technique of communication has to be harnessed to this purpose.

BBC Schools Televisio a demonstrator explai the workings of a moa water-wheel in the seri " Science and Life ".

IT was inevitable, therefore, that sooner or later the Organisation should turn its attention to the form of mass communication richest in promise - television. Five years ago it commissioned M. Henri Dieuzeide, head of schools broadcasting of France's Institut Pedagogique National, to report on current practice and future possibilities of the use of television in scientific education among Western European countries. His report was followed by a conference in Summer 1960 at Ashridge, England, under the Organisation's auspices, of experts from Member countries — both educationists and working practitioners in television — to discuss principles, to exchange information about past experiences and future aspirations, and to consider practical forms of mutual aid.

M. Dieuzeide's report drew attention to the problems and difficulties facing secondary schools all over Europe in meeting their needs for training in science. He found that neither school radio nor educational films — aids which had been at the disposal of most of these countries for many years — had led to any radical change in current teaching habits, and saw in television a means of instilling new life and effectiveness into teaching methods. " It may well provide the teaching profession ", he continued, " with new possibilities of direct observation, new sources of information, eye-witness experience, and better authentication of knowledge; in short, with teaching material which is more quickly assimilated and more easily memorised because it is visual. "

At the time, while other countries had experimental transmissions to schools or embryo school television services projected or under discussion, school television was a reality in three Western European countries only : France, Italy and the United Kingdom. In Italy, " Telescuola " was providing complete teaching courses in a number of subjects as an emergency substitute for pupils who were deprived of the opportunity of secondary schooling altogether. In Britain, programmes were provided as an enrichment to the study of science and other subjects for classes which were assumed to have a competent teacher in charge; they were directed mainly to the less academic type of pupil. In France the provision was rather more varied, and included programmes designed for technical students. A closed-circuit installation at the Lycée de Sèvres was also being used for experiment in the possibilities of direct teaching of conventional mathematics lessons by television. Both Britain and France were experimenting with varied types of presentation and seeking ways of integrating the contribution of television with the work of the schools — a particularly difficult problem in Britain with its very decentralised system of education.

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t the receiving id, children atch and listen sorbed while the levision-set tem- rarily takes the ace of the teacher.

SINCE 1960, under the inspiration of M. Dieuzeide's report and of the Ashridge Conference (where we were also able to hear about the use of television for science teaching in the United States), there have been many developments. First, a number of other Western European countries, including Belgium, Denmark, Netherlands and Sweden, have started school television services, and in all of them science plays an important part in their programme plans; while others, including Western Germany, have had experimental transmissions to schools. OECD is assisting materially in this development by financial provision for " information meetings " in countries about to start school television or in an early stage of development. Such meetings provide a forum in which specialists in education and broadcasting in the country concerned are able to meet experts from other countries such as France, Italy, Sweden and the United Kingdom who have experience of actually operating educational television services and are able to show and discuss examples of their programmes.

An extremely successful meeting of this kind was held in Rotterdam in November 1961, and another in Belgrade quite recently. Furthermore, again under the auspices of OECD, M. Dieuzeide has been enabled to follow up his earlier report with a second one reviewing the conditions of science teaching in the economically less favoured Mediterranean countries, and the possibilities of exploiting television to assist development there.

Secondly, since 1960 there have been major extensions in the services provided by those countries which were first in the field. Italy now broadcasts a full four-year course for her Telescuola pupils, whose numbers are increasing rapidly year by year. France and Britain, while maintaining their series of enrichment programmes which supplement school work by relating it to the application of science in industry, by extending it into the field of contemporary research, and by bringing pupils into contact with leading experts in the field of science, have developed also the potentialities of television as an instrument for direct teaching.

In France, the Sèvres experiments in mathematics teaching have led to courses broadcast from Lille on a regional basis in the first place, but now available for reception throughout the country; other television courses have been developed to assist schools in a major extension of technical education over a wide range of pupils; and new series in specialised branches of science are being broadcast in the early evening, after school hours, for senior pupils and for those who have left school.

IN Britain there have been several new developments of which I can speak with more intimate knowledge. We have devised a course of twice-weekly programmes in

pure mathematics, extending over two years, for academically able pupils studying for public examinations at sixth form level. This is a direct teaching course, designed to help mitigate the shortage of specialist teachers. It is capable of being followed by pupils without a class teacher being present, and in some schools it is being successfully used in this way. More often, however, a specialist teacher has found it possible to make himself free to follow with his pupils, and has welcomed the opportunity to see another teacher's approach to his task. An important incidental benefit of teaching by television lies, in fact, in its capacity to break down the isolation of the teacher and hence to raise teaching standards generally. An equally important function of television is to disseminate among teachers and pupils of whatever age and status an understanding of new concepts in a subject where revolutionary changes are taking place. Concepts which can be subsumed under the general title of 'Modern Mathematics' are the subject of separate series of B.B.C. programmes at three different levels — middle school pupils, sixth formers, and adults — during the academic year 1963-64.

We have also entered the field of technical education with a course of programmes on engineering science : here we find that television is not only able to save the teacher's time by presenting theoretical explanations more vividly and more incisively through animated diagrams, but can consistently keep the pupil aware of the significance of his theoretical work by relating it to industrial practice through specially-shot film illustrations.

The elementary stages of science teaching offer, in our experience, equally important opportunities to television. Here the teacher in charge of the class is frequently not a specialist and lacks confidence in tackling the subject. To assist him, we are providing a year's course of weekly programmes which can form the basis of his work in science, accompanied by a special publication for the teacher to help him develop the broadcasts in a constructive way and illustrated booklets for children with suggestions for experiments they can try out on their own.

THUS in a variety of ways Member countries of OECD are seeking to adapt the power of television to their own particular educational needs. OECD's assistance is again valuable here, for although there are variations in educational practice between one country and another, the visual language of science and mathematics is, generally speaking, international and there are opportunities for fruitful exchanges not only of ideas but of programme material in the shape of film sequences or recorded studio experiments. OECD has made it possible for the heads of the organisations concerned to meet from time to time to explore new possibilities of co-operation, and this co-operation need not be limited to the sphere of national broadcasting systems or the needs of those still at school.

Locally-based television courses have an equally important part to play in the future, particularly at the level of higher education, and under OECD auspices a project is near fulfilment for the setting-up of a low-power transmission station at the University of Nancy in France. The primary object will be to enable technical instruction to be diffused to a large number of classes simultaneously within the university, but an important by-product will be that, with a transmitter range of some ten miles, the broadcast will be capable of being received elsewhere in the city and hence as a source of educational opportunity from which other individuals and organisations (including industrial firms concerned with the technical training of their personnel) could profit. Research on both aspects of the station's effectiveness would be conducted under international auspices. The university is co-operating with enthusiasm in what could, we hope, be a pilot for similar developments in other countries.

Many OECD countries now have some experience of television's power to contribute effectively to scientific and technical education — enough to be certain that we are at the beginning of a major new development, which will involve both national broadcasting systems and local operations on closed-circuit or by micro-wave link.

DO the prospects justify my calling television a " revolutionary instrument " ? I think so. Clearly television adds to the teacher's resources a visual medium of the utmost flexibility; clearly, too, it can disseminate more widely and more rapidly than ever before, and through the agency of specialist experts, information and techniques which are completely up-to-date. But more is involved than this. Television not only offers the teacher new opportunities : it presents him with new challenges. The challenge is perhaps keenest for those who must learn the disciplines of presenting television programmes themselves. But these are a small minority : the teacher at the receiving end is affected no less. His function, in conventional teaching, can be summarised under three headings. He has to be an expositor. He has to exploit his teaching by guiding his pupils in research and in experimentation. And he has to test what knowledge and experience they have gained.

These last two functions must remain the functions of the teacher on the spot. But the role of exposition could often well be taken over by television. This means that the teacher must learn to think of television as a partner in his educative function. It means that educational administrators must take account of television in their decisions about building, equipment, and organisation of any institution concerned with education. These changes will not come overnight, but they are necessary if the challenge of our times is to be met, and OECD, with its concern for the social betterment implied in economic development, is well equipped to foster them.

SOCIAL CLIMATE

as a factor of economic progress

AS social climate stands high among those factors which hasten or slow the rate of economic expansion, improvement of the machinery of communication between employers and workers emerges as another prerequisite for any programme of economic development. The growing size and complexity of industrial organisations make it more difficult and at the same time more necessary for individuals to understand exactly the part they play within these organisations.

Seeking the right environment

Industrial sociological research in the Federal Republic of Germany has revealed, among other things, that workers in large iron and steel concerns showed a general and profound ignorance of the concern in general, and of its internal arrangements in particular, and that the degree to which an individual is informed is related to his position, and thus very likely to become a matter of prestige : the higher the individual's position, the better he is informed ; the better he is informed the higher his prestige. Information hereby becomes an asset which can be cultivated to increase prestige. The result of restricting and filtering information is known in all hierarchical organisations : obstruction of the free flow of information. To the extent that information is scanty, both the firm and its policy are bound to appear overpowering and impenetrable to a large number of its employees.

The reverse can, however, also present a danger. In the words of the German sociologist Theo Pirker, " We still stand before the fact that over-abundant information on masses of paper is liable to suffocate effective communication. Who today is not overcome by an uncomfortable feeling at the sight of fast output printer-perforators pounding out millions of data digits at an incredible rate on miles of continuous tape? I can remember the case of a mail-order business book-keeping department, which had only just switched over to fully automatic computing and processing and which was already completely powerless in the spires of miles of scaler digits... "

OECD has given its attention to this matter which may be summarised as follows : how to arrange within the firm for the free flow, from workers to management and vice-versa, of enough information of the right kind to ensure smooth running. The Organisation sponsored an international joint seminar in London, the report of which has recently been published under the title " Attitudes and methods of Communication and Consultation Between Employers and Workers at Individual Firm Level ".

Understanding human behaviour

The conference Chairman, Professor T. E. Chester of Manchester University, stressed the point that " the adaptation of organisations and individuals to rapidly changing technical and economic needs is probably the most pressing problem of industrial administration in our times... Fundamental research on human behaviour in industry and, even more important, the dissemination of its results are, compared with technical knowledge, still in their infancy, but even more important are the long-established attitudes of ignorance and neglect, prejudice and mistrust, among both managers and workers alike, which make the available data by no means easily acceptable by all ".

The primary aim of communication and consultation should be to develop among all levels of the staff attitudes likely to promote a free flow of information together with an exchange of views on matters of common interest. Mutual respect and trust are thus encouraged and the right sort of atmosphere created. In this connection, a study of managers' attitudes to communications within the managerial group reveals certain aspects that are often misunderstood. Mrs. Winifred Raphael, a specialist in industrial psychology, says : " Most people are not nearly as confident as they seem and many a manager suffers from lack of encouragement and of constructive criticism. 'I have been here for years' is said by manager after manager, 'and have never had a word of praise or a word of blame.

I have no idea what they think of me or what are my prospects for the future'. Regular interviews as part of staff assessment schemes are often greatly appreciated. A manager's status is badly affected if he does not hear officially and in good time about changes that will affect his job or his department. 'It is the boiler-man who gives me news of what is coming to my department', is often a wry expression of deep distress. And it is not only the managers' status and self-esteem that suffer but also the company's efficiency ".

Workers' attitudes to communications within the workers' group also help to shed some light. It is found, for instance, that the " primary social group is often more important than the job. A worker's first loyalty is to his mates; a girl, for example, will often refuse a transfer away from her friends, even for better pay. This being the case, a very important aspect of communications among workers is the opportunity to form a primary social group... The packing department in one pharmaceutical firm was replanned so that much of the packing was done on small conveyors at each of which four or five girls worked. The girls were encouraged to pick their own conveyor teams — the morale of the department went up enormously and the labour turnover went down ".

The question of communication between executives and workers is yet again different: " There is a curious anomaly here. Where good methods of communication exist they are enormously appreciated by both managers and workers, but where they do not exist the desire for them is seldom expressed. On the whole, workers express little desire for consultation with management except in times of crisis or when they want information on particular points : for example, in a textile mill where there was an unexplained unfavourable change in the raw material provided. Similarly, comparatively few managers express the need of knowing the operatives' views. Indeed some — not the best ones — are curiously confident that they know what their workers are thinking ".

Content, means and climate

The tendency to regard communications within the firm as being vital to smooth running is, however, becoming more and more widespread and this is already an important point. The main aspects of the problem still remain to be examined in detail. First of all, the question of *content;* what does each group of persons working in the firm want or need to know? This point has not yet been settled.

Next, the *means* of communication. According to Professor T.E. Chester : " First impressions seem to indicate that the larger the firm the more elaborate a system of communications might be required. There seems also much scope for research in greater depth on the various uses of language in speech and writing and their relevance to the educational standards of different grades of employee. As long as we have, within all European countries, different educational systems for different groups which in turn predetermine the position in industry eventually available to individuals, we can by no means take it for granted that the same words convey the same meaning to all ".

Finally, the *climate* in which these communications take place is also a decisive factor : " If no correct assessment of them is arrived at and brought properly to bear on the whole system of communications, then the best intentions and careful designs will be ineffective. Facts are often ambivalent, and their communication in an industrial situation may lead to misinterpretation and to most unexpected results. As far as external factors are concerned, we should clearly know more about the peculiarities in the social structure of the community from which the firm draws its workers, and how particular historical experiences continue to shape prevailing attitudes in the employment situation. Even more significant, as they can be actively influenced and often controlled by the management, is the relationship of internal factors to effective communication and consultation ".

First steps in communication

All these points are matters which must be studied if the use of effective internal systems of communication is to become widespread. In any event, training will be essential for all levels of management, from the executive management down to the supervisors. Mr. G. Toutin, the General Manager of the Centre de Synthèse (Paris) has been directing a team of consultants responsible for organising this kind of training in French firms employing from 500 to 8,500 people of whom between 8 and 95 were executives and between 5 and 25 were foremen. The primary aim in this case was to create or to develop positive attitudes at all levels. Training was undertaken in descending order of the hierarchy (the example set being of paramount importance in this instance) and studies were carried out in groups, two to eight people meeting under the chairmanship of the head of the department in which a particular problem had arisen. By helping to settle the difficulty, the group thus becomes creative and new outlooks appear among those taking part. Later, the process is extended, first under the direction of experts and then of the executive staff itself. In almost every case a definite improvement was observed in communications as well as a trend towards greater co-operation.

Each country has different legislation and industrial structure and it is not possible to devise a plan of action applicable everywhere and by everybody, yet all the means advocated in one plan or another attest to the now widespread recognition of the need for two-way communication between the various levels of the industrial hierarchy.

A new form of international scientific co-operation :

ENEA inaugurates Nuclear Computing Programme Library and Neutron Data Compilation Centre

by Roland P. PERRET, *Head of the Scientific Division of the OECD European Nuclear Energy Agency*

The first nuclear reactors, built 15 to 20 years ago, were largely experimental and intended to verify newly developed theory. With the progress of knowledge it is now possible to design reactors by detailed calculation and so to achieve improved economy. These calculations concern the nuclear processes inside a reactor, and enable optimum dispositions to be determined for fuel, moderator, and cooling system. Heat transfer, thermal efficiencies and temperature distributions can be calculated, as well as thicknesses and shapes of radiation shields. It is also possible to forecast the behaviour of a reactor and its elements under different power conditions, or to predict the consequences of possible accidents.

Such calculations involve the special properties of matter in the presence of nuclear reactions and particularly of neutrons. These are complex properties which depend not only on the material concerned (or on its various isotopes) but also on the type of radiation and its energy; the different numerical values involved, i.e. the nuclear data, may run into several hundreds of thousands. In a reactor many materials are used and neutrons are emitted at many different energy levels, so that calculations must take account of so many nuclear data that it is no longer possible to compute " by hand ". For this reason electronic computers are used to " process " all these data at high speed so as to complete the necessary calculations in reasonable time.

Before a computer can make such a calculation, however, it is necessary to give it precise instructions for every elementary operation in the process, and these instructions are called a computing programme. A physical problem, for example calculation of the efficiency of a gamma-ray shield, can be expressed as a numerical equation, and the various operations to solve this equation can be assembled in a computing programme prepared by a mathematician or a programmer. This work is difficult and often very long (certain programmes need more than a year for their preparation). But once the programme is established it can be introduced into a computer, together with the values applicable to any particular case and the relevant nuclear data, and the computer will give in a few seconds or minutes answers which would have required many months' manual computation. The same computing programme will moreover permit the solution of many similar problems with any computer of the same type. For example, the same programme can be used to compute the efficiency of shielding of any thickness and any material; only the numerical values used need to be changed. Thus it is frequently of interest to scientists and engineers to exchange computing programmes developed by each other.

In classical technologies, materials data are comparatively few and can be conveniently assembled in tables of constants for use by any engineer. For a given calculation, only a few of the values in these tables are required. In the nuclear field, however, the quantities of data are so great that tables of constants are no longer convenient, and the diffusion of these data therefore presents a new problem. They are measured in specialised centres and laboratories (there are some ten of these centres in Western Europe, and about the same number in the United States) and results are partially published in numerous scientific reviews, but in order to obtain complete data it has been necessary up to now to request them directly from the laboratory which has made the measurements. For the users of data, this search for information takes a lot of time; often the best source is not known, and approaches are necessary to numerous centres before all the data required can be obtained. A similar situation exists for computing programmes.

Thus the value of centralising this type of information, and of creating common services for the purpose, is clear. Such services already exist in the United States in the Code Centre at the Argonne National Laboratory, and the Sigma Nuclear Data Centre of the Brookhaven National Laboratory.

However, for a common service to function satisfactorily it is essential that there should be a sufficient number of users, and that these users should form a sufficiently compact group; too great distances make contacts difficult and decrease the efficiency of the service. In the majority of European countries there are at most only a small number of atomic research centres and a few large computers, so that the additional machinery of common services on a national scale is not justified : the appropriate geographical unit is Western Europe and the common service should be international. This is why the European Nuclear Energy Agency (ENEA), on the initiative of its scientific adviser Prof. Lew Kowarski, has studied the possibilities of international scientific co-operation in this field.

The ENEA work, carried out by experts from Member countries, has shown the need for scientists in these countries to have at their disposal centralised sources of complete and

COMMON SERVICES

precise data. It is to meet this need that ENEA has recently launched a new form of international scientific co-operation — namely small international teams which can provide, on a communal basis, services required by a large group of countries. The services in this case will be the collection and classification of information produced in the different OECD Member countries, and the distribution of this information to interested persons in these countries. The first two such common services to be set up are devoted to nuclear computing programmes and the compilation of neutron data.

ENEA's Nuclear Computing Programme Library

The use of digital computers in atomic energy research and development is dictated by the complexity of the calculations and the large quantities of numerical data involved. Such calculations can be greatly facilitated by improved communications between the originators and users of nuclear computing programmes, so that the most efficient and economic use can be made of the various large computing installations available in Europe for the work. This is because a programme for a given mathematical problem written for one computer can be used for a similar problem on another computer of the same type; and already in Europe there are a good many similar large computers of three or four main types.

Following a recommendation by the ENEA Study Group on Electronic Computation and Data Processing, chaired by Professor Lew Kowarski, twelve ENEA countries (1) have decided to create a Nuclear Computing Programme Library. This Library, which will be closely associated with a similar library at the Argonne National Laboratory in the United States, will be an integral part of the ENEA Secretariat. It is to be installed at the Euratom Communal Research Centre at Ispra (Italy).

Users of the Library will be kept informed of the computing programmes available through the preparation and circulation of abstracts describing briefly each programme, whether American or European in origin, which it holds. These abstracts will be published in a periodical newsletter.

A detailed description of the programme corresponding to each abstract will be filed by the Library. Each description will include a definition of the physical problem concerned and the mathematical methods used for its solution, numerical data to test and verify the programme, and instructions for its use. These programme descriptions will be distributed by the Library on request.

(1) Austria, Belgium, Denmark, France, German Federal Republic, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom.

The Library will collect all the existing programmes in Europe and will receive, on an exchange basis, the American programmes collected by the Argonne Code Centre. Each programme will consist of a set of punched cards or magnetic tapes, together with all necessary information for its use. The Library will automatically make a routine test of every programme received to ensure that no information is missing and that no cards or tapes have been lost. Full testing, to check the programme itself and to trace errors which might have arisen in the reproduction of cards or tapes, will be undertaken by the Library on request.

To carry out these various tests, it will be necessary for programmes written for a given type of computer to be run on a similar computer. The Library will therefore have access to computers of the types most used in the field of atomic energy. The Euratom Research Centre at Ispra has at its disposal IBM 7090, 1401 and 1620 machines, and the Library will also have access to certain other types (CDC, Ferranti, Remington) at Bologna, Milan, Turin and Geneva.

Library activities will be supervised by an international committee composed of one representative from each participating country. The international staff of the Library will comprise six people and its annual operating budget will be of the order of $ 160,000.

To maintain satisfactory links between the Library and the laboratories, institutes and centres participating in its work, a user society is to be set up. Each participating country will designate those of its laboratories, institutes or centres which will take part in the work of the Library, and each of these establishments will nominate a qualified member of its staff to maintain direct liaison with the Library.

ENEA's Neutron Data Compilation Centre

The effort devoted by OECD Member countries to the measurement of nuclear data is continually increasing. Large sums of money have been and are being spent on the necessary facilities (particularly accelerators and research reactors), on isotopic samples and on the operating costs of installations. Yet it is a common complaint that the results of these efforts are difficult to obtain and do not always reach those who need them most. In the past various groups, notably in the United States, have made compilations of the more widely used nuclear data, but the quantity of experimental data now being produced is growing so rapidly that existing compilation facilities are becoming inadequate.

In 1959, to stimulate and co-ordinate the measurement of nuclear data in the countries of OECD, ENEA set up a European-American Nuclear Data Committee. It was this Committee which, after investigating existing facilities for data compilation and distribution, recommended the creation

CETIS Computer Room at the Ispra Communal Research Centre.

in Europe of a compilation centre whose task would be to collect and classify experimental data, to make known what data were available, and to distribute them on request.

Following an ENEA-sponsored study of this recommendation, twelve ENEA countries (1) have agreed to set up a Neutron Data Compilation Centre. The Centre, which will be closely linked with American compilation centres (especially with the Sigma Centre of the National Laboratory at Brookhaven), will be an integral part of the ENEA Secretariat. It is to be installed at the Centre d'Études Nucléaires at Saclay, France.

Users of the Centre will be kept informed of nuclear data measurements by means of a bibliographical reference system called " CINDA ", which has been developed and operated in the United States by Professor H. Goldstein of Columbia University and by the United Nuclear Corporation. This system consists of a master file on magnetic tapes which contains abstract references to all publications on experimental or theoretical neutron data produced. The master file will be kept continuously up-to-date on the basis of information extracted from the literature, e.g. by volunteers from the participating organisations. Each year the master file will be fully printed out and copies distributed to all participating establishments. An additional cumulative listing of all new information entered in the master file since its last publication will be prepared and distributed each quarter. The Centre will also be able to supply any information from the master file on request.

The second, and by far the most important, activity of the Centre will be the collection and filing of experimental data produced in Europe and the United States. The filing system chosen will enable all information to be stored on magnetic tapes in a compact fashion, and to be located and extracted by means of an electronic digital computer printing out the desired data automatically. It may be noted that this represents an important development in the means of transmission of information : although in classical engineering it is still possible to print and distribute engineering handbooks or tables containing all necessary data, such a printed form is far from adequate for neutron data. Moreover since these data are normally used in electronic computers they must necessarily be presented in an appropriate form, e.g. on punched cards or magnetic tapes. Further, the increasing quantities of data (several hundreds of thousands) would make printed tables prohibitively large : and lastly, since filing of information is already done on magnetic tapes, it seems natural to exchange information directly in the form of stored magnetic energy. This new method of information communication has been adopted by the Compilation Centre.

The staff of the Compilation Centre will be gradually increased from 9 to 12 people and its operating budget will be of the order of $ 200,000 for the first year.

As for the Nuclear Computing Programme Library, the activities of the Compilation Centre will be supervised by an international committee composed of specialists from the participating countries.

Conclusion

This new form of international scientific co-operation which ENEA has launched is equally applicable to numerous other fields in addition to those described above. Much scientific work is often duplicated in different centres due to lack of co-ordination or to an insufficiently fast exchange of information. The creation of more common services for the collection, classification and diffusion of such information will certainly facilitate better use of new knowledge coming from research centres and laboratories. But co-operation of this type is useful only if it groups a sufficient number of users, which in many cases means organisation on the Western European scale.

Finally, the two new ENEA activities described will bring into being a new system of information exchange in the form of magnetic tapes. The European-American services which ENEA has now inaugurated are services in which electronic machines " speak " directly to other electronic machines.

(1) The same twelve which are supporting the computer programme library already described.

THE MEDITERRANEAN REGIONAL PROJECT

Six Mediterranean countries have recognised the need for a planned strategy for education with an economic as well as social purpose. In a joint endeavour with OECD, they have applied a unique method in assessing future educational resources required to produce the qualified personnel a developing economy will demand. This is the Mediterranean Regional Project. Final reports based on three years of research by specialists are to be published in the near future. This article describes the "methods" employed and provides a first look at some of the more general findings.

*** GREECE
ITALY *****
* PORTUGAL
SPAIN *****
** TURKEY
YUGOSLAVIA

Six countries introduce a unique method in planning strategy for education

IN 1960 an estimated 17 million youngsters were enrolled in elementary schools in six Mediterranean countries — Greece, Italy, Portugal, Spain, Turkey and Yugoslavia. With school attendance beginning at 6 or 7 years of age they represented a very respectable 67 per cent of the relevant school age population, 5-14 years, in the six countries. A modern economist would say they comprised the " human resources " on which their nations would depend for social and, more particularly, essential economic development during critical years up to the mid-1970's. Out of their numbers one hoped for the qualified personnel to man the advancing economies — lawyers and doctors to be sure, but also scientists, engineers, chemists, agronomists, managers, teachers, technicians, bookkeepers, drilling machine operators, toolmakers, wine growers, fishermen and farm hands, among many others.

Expressing the economists' view, perhaps in saltier terms, the classrooms in these schools could be considered production units in the nation's economic growth. This is substantially the meaning behind the new phrase : " Investment in Man ". The governments, dedicated to rapid industrialisation, could no longer afford the luxury of considering all but primary education a matter of individual consumption for an elite group. While not denying its role for social development, their economists and political leaders accorded it another, more pressing mission : a force that gives a powerful thrust to the country's rate of economic expansion.

All six countries are now shaping economic policies that call for a rapid pace of modernisation. Three, Greece, Turkey and Yugoslavia, have committed themselves to definite development plans worked out in five-year stretches. Spain and Portugal have plans

for four and six-year periods respectively, and Italy, following the earlier Vanoni plan, while not charting such a carefully defined course, is now embarking on more comprehensive long-range economic planning.

In all six countries, planned economic expansion rates, as measured by annual increases in gross national product, range from 5 per cent for Italy and Portugal, and 6 per cent for Greece and Spain, to 7 per cent in Turkey. Enormous investments are planned for industry and services to bring greater balance to their largely agrarian economies. Agriculture itself, riddled with under-employment, will be made to produce more efficiently through modern techniques and productivity methods.

Transport and communications systems are to be extended; so, too, public health and other services. Natural resources would be further exploited in forestry, mining and tourism. Waterways would continue to be harnessed to produce irrigation for eroded lands and hydraulic power for new and old industries.

A key factor in the development plans is manufacturing. The part of artisanal enterprises and small workshops in total production would diminish ; these would tend to be absorbed by larger, more efficient industries or disappear from the scene. Governments concede increasing importance to mechanised production processes, taking over where possible the technological advances and innovations produced in advanced countries.

But in all planning phases a question has presented itself with annoying regularity — how to find the necessary manpower. This question is posed not just in terms of numbers but also in terms of skills. Where were they to come from ? Training on the job could help. Stepping up the apprenticeship systems and broadening vocational training and adult education would add more. Some could be brought from abroad at high cost. But it was obvious that a major burden would fall upon the various national educational systems.

The six countries have recognised the need for a carefully planned strategy for education. There was a sense of immediacy about this planning in view of the long-term character of the educational process. In 1960 OECD (then OEEC) concluded bilateral agreements with the six governments (five are Members while Yugoslavia participates in some OECD activities) that brought into being the Mediterranean Regional Project.

The project became the responsibility of OECD's Directorate for Scientific Affairs. The participating governments, with advice from the Organisation, recruited national teams of young specialists including economists, educators and statisticians. The national Directors were distinguished economists who had a background of economic planning experience and who had great interest in education. They began at once on exhaustive studies of the educational structures of the six nations with relation to needs, particularly those for qualified personnel generated by economic development. Perhaps more simply defined, the teams were to draw up reports for ministers on educational needs and required expenditures up to 1975. The work of the teams and the cost of the advisory work by OECD, including meetings of Directors, were jointly financed by OECD and the six nations.

In Greece the work has been carried out within the Ministry of Coordination. In Spain it was lodged in the Ministry of Education. The Turkish and Yugoslav teams were stationed in manpower planning divisions of the Economic Planning Office. In Italy and Portugal, the work was assigned to private organisations, SVIMEZ and the Centre for Higher Economic Statistical studies respectively. In all participating countries the teams have had close contacts with ministries of education, economics and finance. They have been guided in their work by steering committees as well as OECD consultant and staff specialists from the Organisation's Paris headquarters.

The six national reports have now been completed and are in the process of being published by OECD. They will be presented, together with recommendations and conclusions, to the proper departments of the various governments. The Organisation is also publishing a general report focusing attention on policy implications of these unique studies.

The Mediterranean Regional Project is unique inasmuch as it makes an unusual contribution to economic progress and higher standards of life for millions of people. It is the first project of its kind to be undertaken by an international organisation.

In their search for material and in making forecasts for future educational needs, the teams followed a " methodology " carefully worked out from practical experiences in this field and from discussions on how the problems could best be solved. Several approaches were used but the main guidance is summarised in the published work of Professor Herbert Parnes, of Ohio State University, and a former OECD consultant : " Forecasting Educational Needs for Economic and Social Development. " The methodology called for studies to be made in sequence.

STEP 1
Studies of Existing Educational Systems

One economist close to the Mediterranean Regional Project has described the situation in this way : the Mediterranean countries traditionally have placed too little emphasis on the " propagation of mass education including that of the more technical and practical kind to satisfy the urgent aspirations for higher living standards. " The picture of educational systems as structures emerges perhaps more clearly from a glance at the research done on student flows. The statistics are broad estimates. *(Continued page 20)*

For all six countries, the total school - age population in 1960 was 50 million. The ages ranged from 6-24. The percentage of this school - age population actually in class that year was 40.8 per cent.

Mostly, however, these students were in elementary grades, covering the years 5-14 (that is 67 per cent of the relative school age group). After that the trend was downhill. The bulk either dropped out during or at the end of the elementary school years. In secondary schools (ages 15-19) the percentage of that school - age group was only 5.0 and those in higher education was 3.9 per cent.

The curricula for most of the six countries were largely non-technical. Of students in secondary schools in 1960 a mere 27 per cent were taking courses in technology and vocational subjects. In higher education the figure was slightly higher at 32 per cent.

The number of degrees given in art subjects and medicine far outnumbered those in science and technology discipline. Of the graduates in 1960, 31,400 received degrees in art subjects and 6,100 in medicine. Science-based degrees were 18,300. This is one aspect of the fact that the deficiencies of the existing educational system cannot be measured solely in terms of the overall educational effort. They include also the unsatisfactory balance of this effort in relation to the needs of a rapidly developing economy. For the same reason, policies to remedy the deficiencies of the educational system must put heavy emphasis on the content and substance of education.

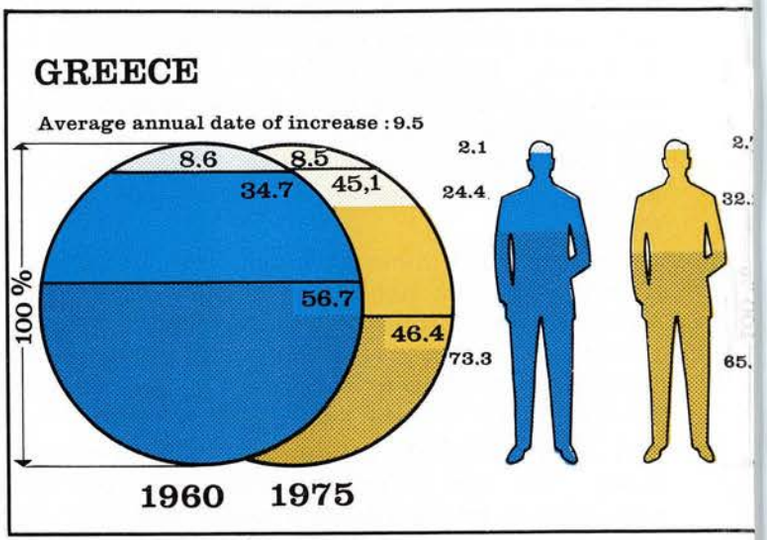
In another contrast, the studies showed that of those students who had entered faculties in economics expecting to graduate in 1960 in Italy and Turkey, only 20 per cent actually did so. The graduation rate for medicine, on the other hand, was 60-70 per cent of those studying for medical degrees.

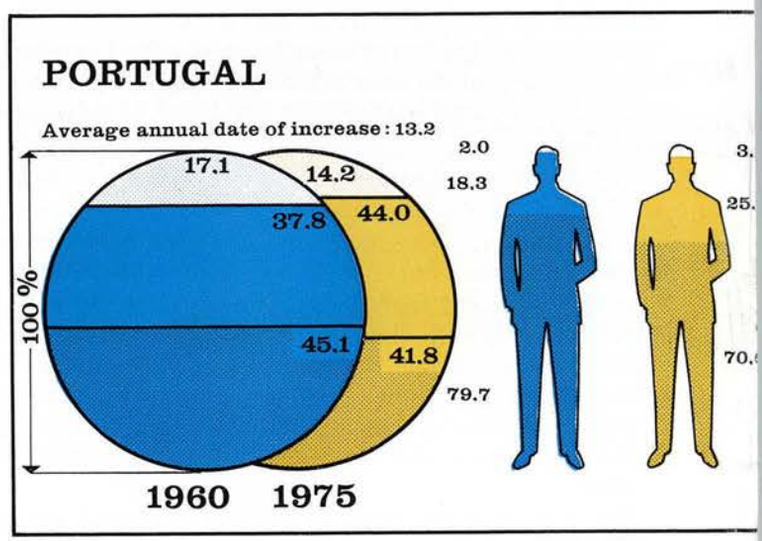
For some of the countries, the picture was brighter among students studying abroad. For Greece, for example, of the 8,800 studying abroad in 1961, over 5,000 or 58 per cent were science students. In 1960 over 68 per cent of the 1,590 Turkish students abroad were in similar science courses. This stock represents to some extent a future potential supply of qualifications for their countries' economies, but many students will not return home and it would seem that the countries gain more by establishing their own universities and reserving study abroad for post-graduates.

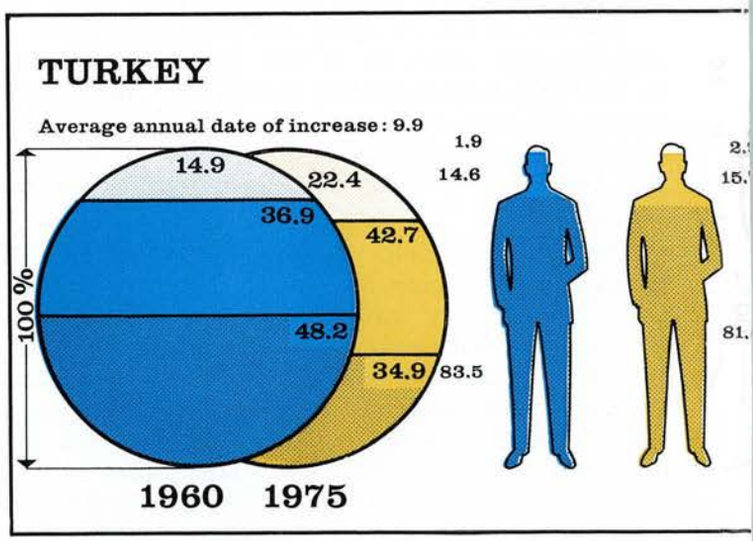
Among additional problems in the six-country area, the teacher shortage was a major one. For them salaries and status were both comparatively low. It seems essential that at all levels teachers should be paid enough to allow them to spend most of their time teaching. In some rural places a single teacher would conduct classes for all primary grades. In the cities, where the shortages of teachers and buildings were particularly acute, students were divided into two, or sometimes three, shifts for each class. The number of students in each shift was around fifty.

One indication of the level of educational effort in these countries is the comparison of the proportion of

PROPORTION OF TOTAL CURR
AND STUDENTS (B







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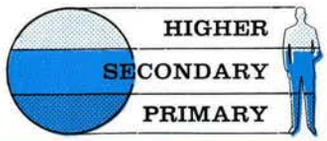
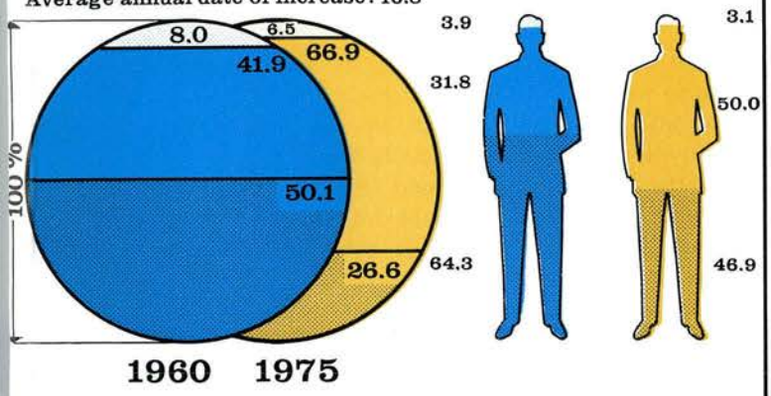
EVEL)



PUPILS PER TEACHER IN SECONDARY EDUCATIO AND CORRESPONDING INCREASE IN TEACHER

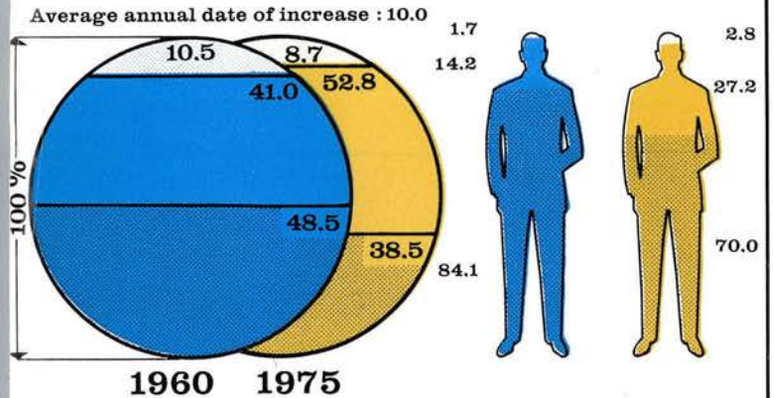
ITALY

Average annual date of increase: 10.8



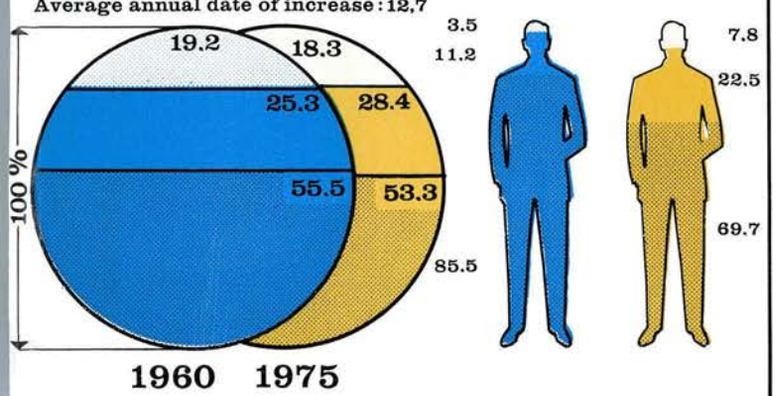
SPAIN

Average annual date of increase : 10.0



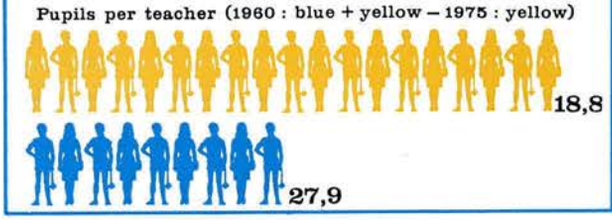
YUGOSLAVIA

Average annual date of increase : 12,7



GREECE

Pupils per teacher (1960 : blue + yellow – 1975 : yellow)



Number of secondar teachers require (1960 = 100)

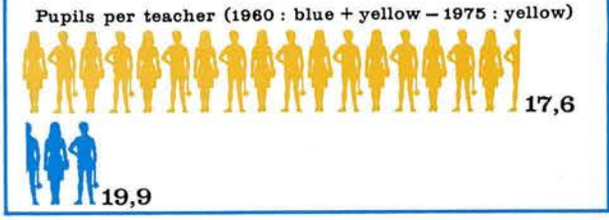
ITALY

Pupils per teacher (1960 : blue + yellow – 1975 : yellow)

Number of secondar teachers require (1960 = 100)

PORTUGAL

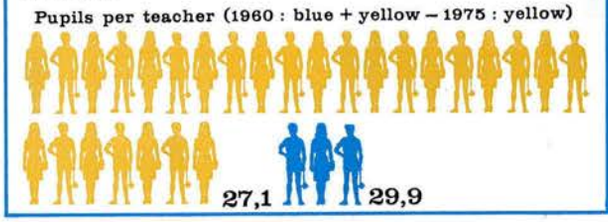
Pupils per teacher (1960 : blue + yellow – 1975 : yellow)



Number of secondar teachers require (1960 = 100)

SPAIN

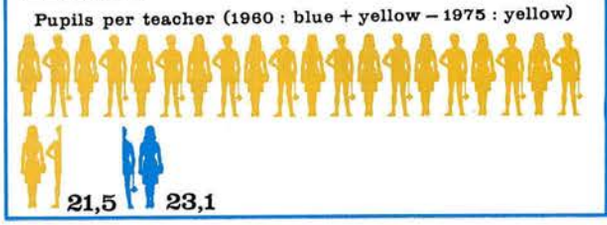
Pupils per teacher (1960 : blue + yellow – 1975 : yellow)



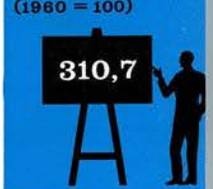
Number of secondar teachers require (1960 = 100)

TURKEY

Pupils per teacher (1960 : blue + yellow – 1975 : yellow)

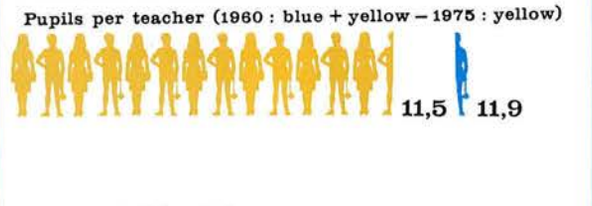


Number of secondar teachers require (1960 = 100)

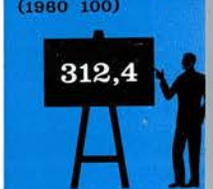


YUGOSLAVIA

Pupils per teacher (1960 : blue + yellow – 1975 : yellow)



Number of seconda teachers requir (1960 100)



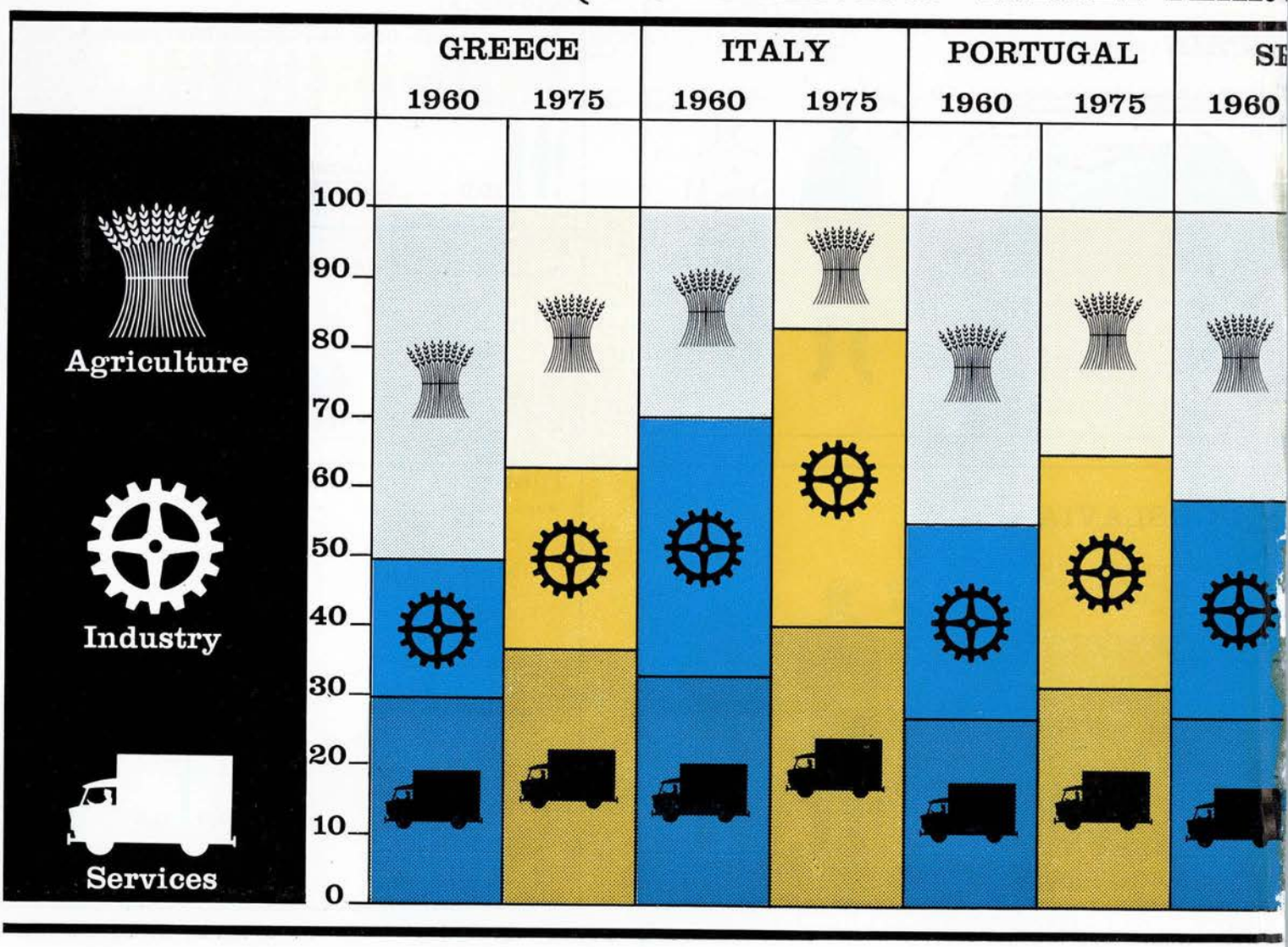
national product devoted to educational expenditure. In 1960 the proportion of public educational expenditure was : Greece 1.3 per cent, Italy 3.0 per cent, Portugal 1.3 per cent, Spain 1.0 per cent, Turkey 2.0 per cent, Yugoslavia 1.8 per cent. However, in four of these countries there was also an unknown amount spent on private education which accounted for the following proportion of total enrolments : Greece 11.5 per cent, Italy 13.4 per cent, Portugal 7.5 per cent, Spain 32.5 per cent.

STEP 2
Projecting Requirements of Qualified Personnel

An essential part of the work of the teams was to prepare estimates of needs of the different types of skilled manpower as a guide to requirements for the different levels and types of education. In forecasting manpower needs for 1975, the research teams, in conjunction with their national authorities concerned with economic planning, worked out targets for total output and the distribution of output by sector and in the case of industry by main branch. These targets took account of available manpower and by using assumptions on the desirable, and reasonable, trend of production per man-year the teams produced projections for the distribution of total employment in 1975 by sector and where relevant by industry.

When total manpower needs, by sector and branch had been estimated, the MRP teams turned to the elaborate task of grading them by occupational group. This involved a careful classification of the occupational structure of the occupied labour force in the base year (usually 1960) and the examination of how this structure was likely to change by 1975 having regard to : (a) the shifting distribution of employment among

PERCENTAGE DISTRIBUTION OF LABOUR
(BASE YEAR : 1960 - TARGET YEAR



industries with different occupational patterns and (b) likely changes in the occupational pattern within different industries. The product of this phase of the work was the establishment of a target for the different main groups containing, in descending order of qualification, the occupations listed in the International Labour Organisation's Standard Classification of Occupations (1).

As a result of this work the teams produced estimates of the main groups of qualified manpower which needed to be in the labour force by 1975 and took into account the needs of industry, agriculture and services for skilled people. No single method of estimating these future needs was accepted and these first targets must be periodically revised in the light of new knowledge.

MRP teams used techniques that included careful studies of census reports and other collected statistics that might indicate trends for the future. They also went into the field and interviewed employers to get their estimates. Another method was the use of comparisons.

Comparisons were made with the most advanced branch of an industry, within the MRP country itself, on the assumption that this would become the general pattern by 1975. The job category structure was also studied in advanced countries for industries and services that had achieved a point in development which the MRP country might wish to attain in some fifteen years.

This work has produced vital new information on the way in which the employment structure and the pattern of qualifications should move in the future. The reports emphasised that a disproportionate share of the labour force in most of the countries was in agriculture. Many were under-employed.

In Turkey 77 per cent of all manpower was on farms; in Yugoslavia, 64 per cent; in Greece, 53 per cent; in Italy, 30 per cent; in Portugal, 45 per cent; and in Spain, 41 per cent. For a comparison in round figures, one example might serve — Turkey. There agricultural workers totalled about ten million while only three million were employed in industry and services in 1960.

For a better balance in the manpower structure severe reductions of farm labour would have to take place, with a subsequent rise in the labour force in industry and services. Just how much of a shift would be needed for a modernising economy was the problem the MRP research teams had to take into account. Their projections now call for reductions in agricultural manpower in five of the countries. Turkey, with a birth rate increasing at three per cent annually, which will nearly double its population by 1977 to 43 million, will have a slight increase in the number of farmers in the 1977 target year. For the other five the number of farm workers will be reduced from 18.4 millîon in 1960 to 14 million in 1975. Employment in industry will go from 14.1 million to 18.3 million ; and in services from 13.8 to 18 million.

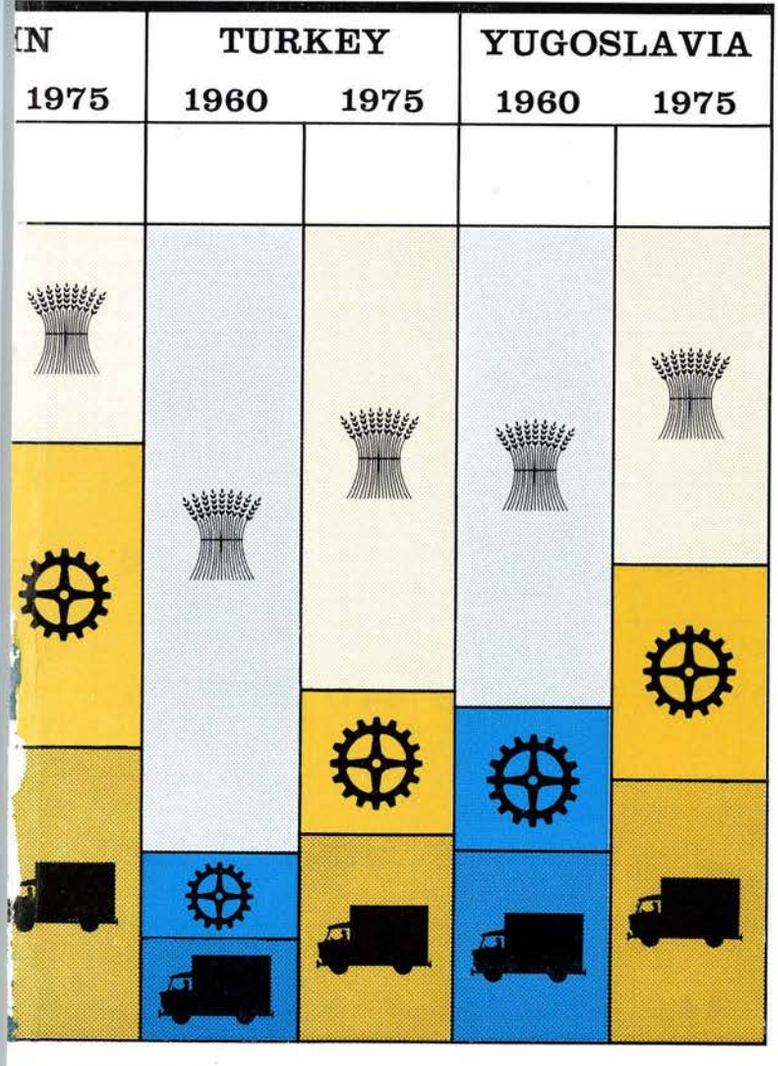
Actually, migration from farm lands to industrial cities has been under way, notably in Greece and Italy, for the past ten years or so. In the latter country, a million agricultural workers moved to urban centres, mainly in the North, and MRP experts expect this to continue at the rate of 100,000 annually.

Other control factors affecting the future manpower supplies and requirements which were studied by the MRP teams included death and retirement rates in the work force, unemployment and immigration to advanced countries.

Figures in the last-named were surprisingly high. In 1961, Greek emigrants to other countries were 59,000 ; for Spain the number was 34,000 ; Portugal, 34,000 ; Yugoslavia, 41,000 (in 1958) ; Turkey, 3,500 and for Italy, the leader in the field, 370,000. Migration presents a serious drain for these countries. However, on a more hopeful note, some of these emigrants are learning new and higher skills in countries like Ger-

(1) For a complete statement of these see : " Forecasting of Educational Needs for Economic and Social Development ", OECD, 1962.

'ORCE - BY INDUSTRY
975)



Control room of a refinery on the Marmara Sea. Turkey is developing her industries, but here as in the rest of the MRP area more technicians and skilled workers must be found.

many, Austria, France and other nations. If work conditions were to improve at home they would undoubtedly return and thus add new strength to the total manpower supplies in the future.

An example of the manpower forecasts, showing the problems that must be solved in the future, is made for Greece. In 1961 the employed manpower was 3,395,000 persons. A net increase of 565,000 by 1976 is expected, but the number of additional jobs opening in industry and services alone is estimated at 900,000 in the target year.

Unemployment should fall (200,000 in industry in 1961). Under-employment in agriculture should decline (400,000 in 1961). At the same time Greece intends to achieve five per cent of its expected growth rate in gross national product through increased productivity with less than one per cent to be attributed to increased employment. The reason is the need, now that the country is an associate member of the Common Market, for a more competitive posture for its exports both in foreign and domestic markets.

OCCUPATIONAL BREAKDOWN OF TOTAL LABOUR FORCE 1960-1975 (Percentages)

	GREECE		ITALY		PORTUGAL		SPAIN		TURKEY	
	1960	1975	1960	1975	1960	1975	1960	1975	1960	1975
Higher Personnel (administrative, professional)	2.3	3.1	3.2	6.6	1.8	5.7	4.5	5.5	1.1	3.2
Middle Personnel (technicians)	2.6	3.9	5.2	11.4	0.9	2.0	0.7	1.9	1.1	2.6
Lower Personnel (craftsmen, skilled workers)	28.3	38.1	26.9	53.0	19.5	30.0	30.9	44.0	9.7	21.1
Unskilled workers	16.2	17.2	28.1	11.1	33.8	27.7	22.6	21.2	10.9	13.4
Farmers and farm workers	50.6	37.7	29.7	17.9	44.0	35.0	41.2	27.4	77.2	60.7

MRP studies have produced some interesting forecasts for the increased needs in job categories for 1975. For example, for the MRP area *top grade* jobs are to increase from 1.5 million to 3.1 million. In this category we find managers, administrators, professional personnel including doctors, teachers, artists, scientists and engineers. For *middle grade* personnel, the needs will be 3.5 million in 1975 as against the 1.4 million in 1960. Here are included technicians like radio and telecommunications experts, textile plant experts, draughtsmen and forestry workers. The greatest demand of all will be for *lower grade* personnel consisting mostly of skilled workers. The demand for unskilled labour and farm workers was to decline relatively in all six countries.

STEP 3
Projecting Educational Resources needed in 1975

In this section the MRP teams approached a critical phase of the two-year studies. They had arrived at fairly good estimates of the numbers and kinds of jobs that would be required by the advancing economies of 1975. The point now was to estimate the educational requirements a man or woman would need to acquire in order to perform the specific job category into which he or she would presumably move by the target year.

The number of years it takes to educate adequately a person entering a profession like medecine, science, engineering and high-level teaching is fairly well known, although in the Mediterranean countries it seems to be higher than in several others. Most countries have specific standards that are followed. But assessing educational qualifications to permit " managers " or some types of middle and lower-grade personnel to function in their upgraded jobs is far from being an exact science. The teams used several methods. These included, in some countries, a study of census reports which included occupation-educational breakdowns. There was also the availability of data from advanced countries that was applied to the MRP countries in an international comparison technique. Standards were established by studies of the educational background of workers in advanced countries which could be applied to the MRP country. In one country a licensing procedure existed which called for certain educational qualifications as a condition of practising a profession or a skilled trade. In some cases ambiguities arose. Educational systems varied and even in the same job group skills and the required educational qualification varied also. Often skills and the educational background for them varied within various job categories. In many cases the MRP teams had to exercise considered judgment.

Once the job-education link had been made, the MRP teams moved on to a conversion of stocks of qualified manpower to the required stocks of graduates from the various levels of the educational systems. This returned the research teams to flows of enrolments — those that would be necessary if goals were to be achieved. The teams had also to take into account in formulating targets for educational flows specific policy requirements in respect of such factors as the raising of the number of years of compulsory education. In these senses the statistics told the story of general educational needs for the years up to 1975, in terms not only of students but of teachers needed to instruct the additional pupils and the buildings and equipment that would be required to provide the necessary instruction.

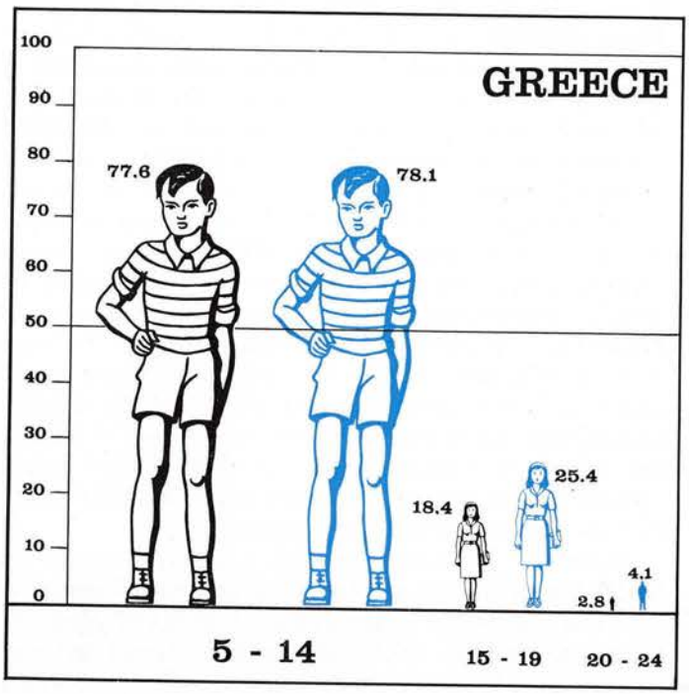
For all six countries the enrolments by level as a proportion of the relevant school age population should increase from 82.7 per cent in the primary (6 to 14 years) grades to 99 per cent in 1975. In the secondary schools (fifteen to nineteen years) forecasts call for an increase from 28.8 per cent to 51.1 per cent. For higher education the ratio is to go from 3.9 to 5.9 per cent.

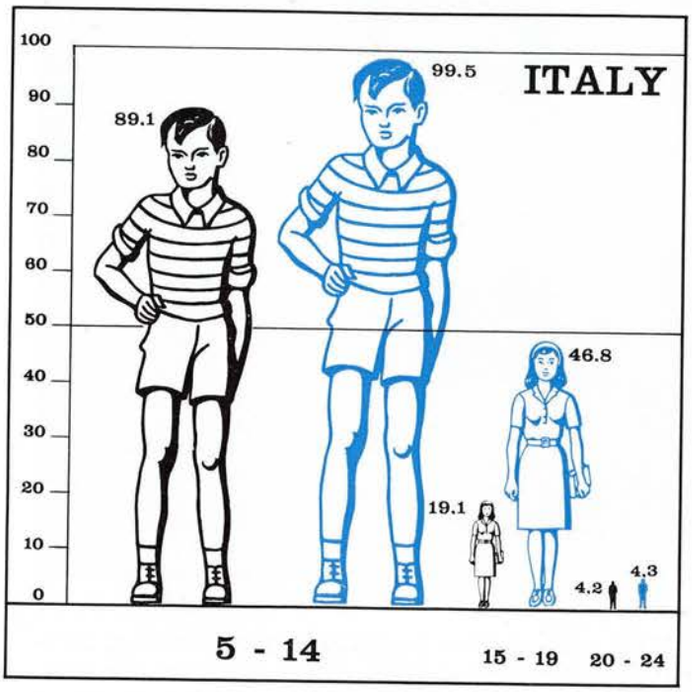
Of the total number of secondary students enrolled by 1975 those in science and technology courses are to be 31.4 per cent compared with 18.1 in 1960. In higher education, the percentage in science-based courses is to rise from 31.5 in 1960 to 39.1 in 1975.

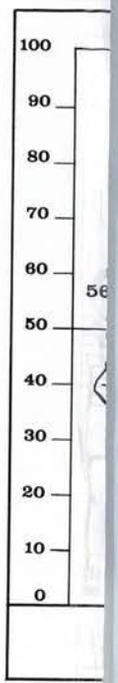
The increase in teachers called for also includes the objective of improved ratios between teachers and pupils. In 1960, the ratio was 20 pupils per teacher. In 1975 for the six countries this should be reduced to 18 pupils per teacher.

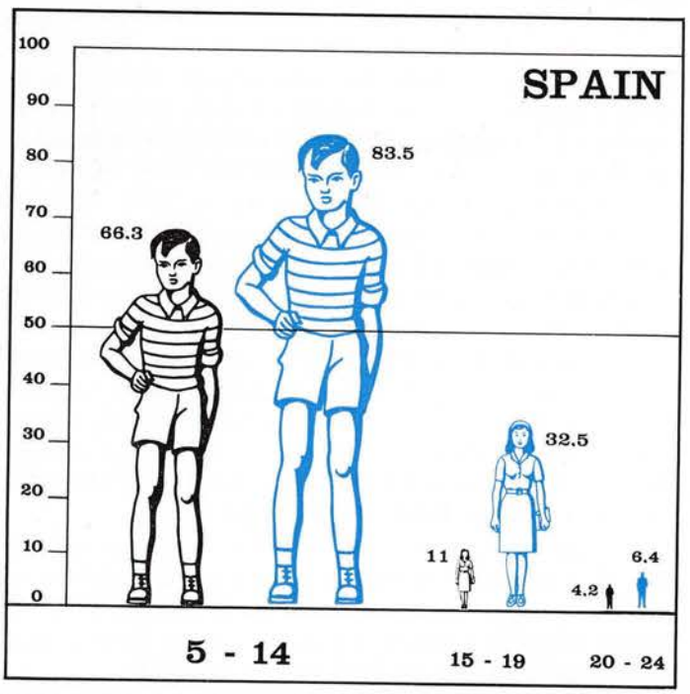
For higher level graduates per 1,000 active population the number is to go from 1.5 to 3.1 in 1975 including Yugoslavia. Excluding Yugoslavia, the figures are 0.9 and 2.2. *(Continued page 26)*

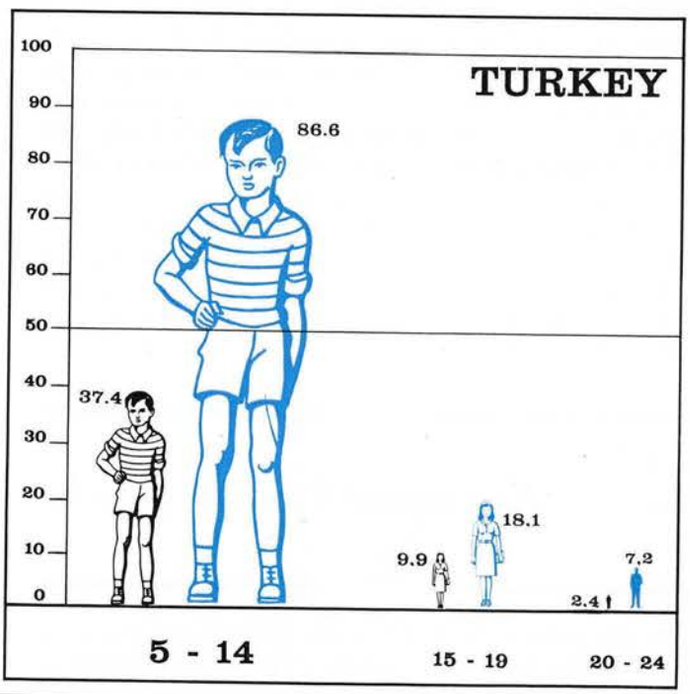
ENROLMENTS AS A PROPORTION OF TOTAL
IN AGE GROUPS (BASE YEAR : 1960 - TA

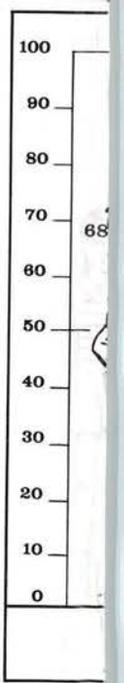










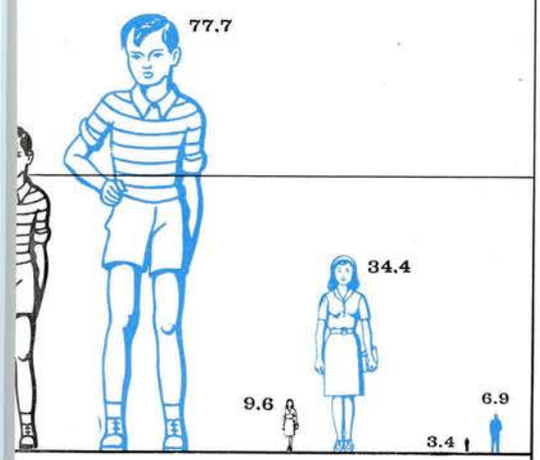


	(FR) GERMANY	SWEDEN	USA	
	1958	1960	1958	
5 - 14	80.2	82.6	89.9	
15 - 19	17.6	38.3	66.2	
20 - 24	4.6	11.0	18.0	

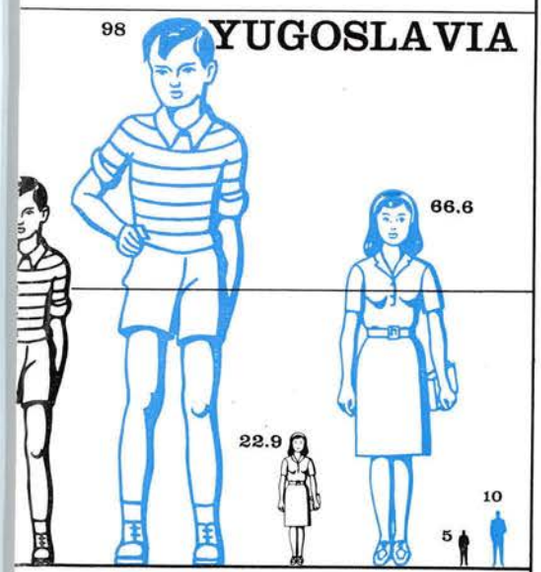
POPULATION

GET YEAR : 1975)

PORTUGAL



YUGOSLAVIA



USSR	BELGIUM
1958	1957
71.5	95.4
18.6	31.5
8.2	5.5

HIGHLIGHTS FOR EDUCATION BY 1975

GREECE : *The number of students in elementary schools is expected to decrease by 30,000 by 1975. This is due to the country's lower birth rate which declined from a peak in 1956 at 19.3 births per 1,000 population to 18.1 per 1,000 population in 1962. This will allow authorities to concentrate on secondary schools where the enrolments will show a substantial increase from the 241,000 students in 1960. A feature here is that the number of enrolments in vocational and technical schools should double to reach a predicted total of 80,000.*

ITALY : *the Italian birth rate has also been on the increase with an impact on its schools. By 1975 eight years of compulsory schooling will be required and thus elementary schools must be ready to train 6,400,000 boys and girls up to 14 years of age. In 1959, about 85 per cent of the Italian labour force had only an average of five years of education. Only two per cent held university degrees. By 1975, 20 per cent should have had at least eight years of formal education ; 48 per cent, ten years ; 18 per cent, 13 years ; and 8 per cent with higher education diplomas; employees with university degrees should then comprise six per cent of the manpower supply.*

PORTUGAL : *Portugal's model for education and manpower structures was the 1959 situation in Italy ; however, the targets have been scaled down somewhat.*
The Portuguese MRP team forecasts an expansion of the school system to accommodate in 1975 three times the students now taking technical and professional courses (395,000 in the target year). The achievement of this target is conditional on a government decision regarding priorities, since expenditures for this expansion are expected to meet strong competition from other sectors under development, especially from water supply and health needs.

SPAIN : *Here the main emphasis has been on secondary education ; the proportionate expansion of more highly qualified personnel has not been so great, though the need for more applied scientists and technologists is carefully considered.*

TURKEY : *Unlike Greece, Turkey's high birth rate has a complicating effect on its educational system. Forty-two per cent of its present population is 14 years old or younger, a ratio expected to hold to 1977. This means a large demographic wave washing up against its educational system, especially in elementary grades, for years to come.*

YUGOSLAVIA : *Here industry is generally responsible for construction of technical training schools. Occasionally, several industries with similar demands in technical personnel combine to build these schools. University enrolments should rise from the already relatively high figure of 105,000 in 1960 to 352,000 in 1975. This increase is to come largely from the mushrooming secondary-technical schools from which, a team spokesman said, " came the best students in the country. " At the same time the educational authorities will have to achieve large expansion of sub-university technical education.*

continued page 28

PUBLIC EXPENDITURE ON EDUCATION AS A PERCENTAGE OF GNP

	GREECE	ITALY	PORTUGAL	SPAIN	TURKEY
Year	1961	1961	1960	1960	1960
	1.7	2.8	1.8	1.2	2.6
Year	1974	1975	1975	1975	1975
	2.7	8.2	4.4	4.5 (1)	5.2

Notes : (1) For 1975 Spain estimated only TOTAL expenditure, public and private.
It is not possible to provide a comparable figure for Yugoslavia.

STEP 4
Costs and the Financing of Education

Having arrived at assumptions for school enrolments and teacher needs for the target years, the MRP teams moved next to estimates of costs for capital investment in building and equipment and the current or operating expenses. In estimating capital investments, data derived from costs of recently constructed school buildings proved helpful. However, costs could vary widely for this same type of facility and it would be necessary in preparing detailed investment plans to analyse the distribution of costs among various elements, or parts of the school building with regard to their function. These parts would include in addition to classrooms, libraries, laboratories, gymnasiums, teachers' rooms and the like. This type of cost analysis would produce substantial economies in school construction.

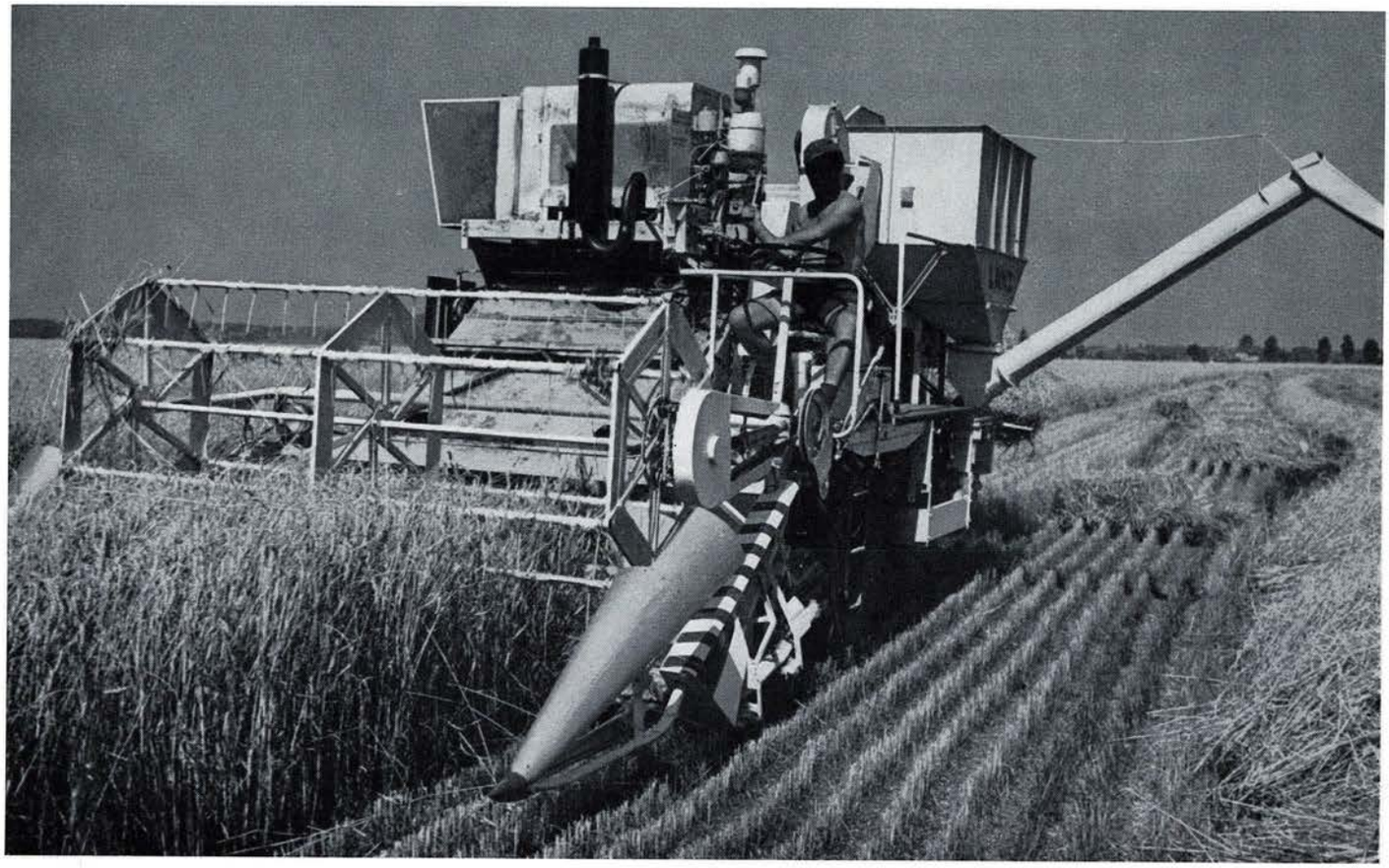
In their approach to costing current expenses teams gave priority thought to teachers' salaries since these comprised the largest share of this kind of expenditure. Any contemplated changes in student-teacher ratio had to be considered, as well as provision for gradual increases in salaries as per capita national incomes rise.

At the same time, the planners were aware that government policy-makers were faced with competing demands for national resources and that compromises would certainly have to be made. Thus the MRP experts made a final evaluation of the financing needs in the light of what was feasible. Calculations finally agreed upon by the teams as a percentage of gross national product and total public expenditures provide at least rough estimates for the plan. The estimates, made for public education only, are shown in the table above.

The Mediterranean Regional Project is thus seen to be a study in planning, but along with the broad programme of educational and technical assistance sponsored by OECD the objective is higher living standards for more people. While the immediate goals are the provision of qualified personnel for economic ends, the expansion of educational systems in themselves achieve valuable economic and social long-term results. Economists believe that as the level of education rises in a country, a more sophisticated demand situation is automatically created which in turn has favourable effects on the economy. As standards of living go up, creating larger incomes, more demands are made on education — with the happy thought that there is money to finance it.

The statistics and conclusions of the MRP reports are not immutable. In fact, the reports are merely the end of the first phase for the project. In co-operation with the participating countries OECD is working out proposals to be submitted to a meeting early in 1964 of Ministers of Education and Finance for the continuation of the second phase, that is, realising long-term objectives. During this phase, the emphasis will be on the coordination of educational and economic planning to see that resources are being used in the most economical way. As the project is seen through, research will be intensified with regard to the supply of teachers, school building investment and location programmes and improving the " yield " of education.

AGRICULTURE



in a growing economy

The experience of the OECD countries

by Albert SIMANTOV
Head of the OECD Agricultural Policies Division

WHETHER it is called economic progress, economic development or economic growth, the continued rise in the level of a nation's output accompanied by a rising standard of living per person over a long period, constitutes one of the central issues of our time. The process of economic growth involves an increase in the total resources available to a country, as well as changes in the relationships between the different types of resources. To achieve the most efficient use of its available resources, and thus to permit further growth, it is essential for a nation to shift

Changes in the composition of inputs (in volume terms) 1950-1959 North Western Europe

Note: The percentage composition of total inputs is that of 1959.

them as between different uses so as to obtain the maximum result that its present technological possibilities can allow. This article sets out the problem of agriculture in relation to economic growth.

The challenge to agriculture

Agriculture is challenged to contribute to growth and is offered an opportunity to raise its own efficiency; and this includes questions of incomes and of standards of living. Developments of the recent decade in the OECD countries show that agriculture in this area has, at least at national level, accepted this challenge.

Agricultural efficiency has been rising in almost every country at a substantially higher rate than in any previous period since the beginning of the century; expressed in terms of farm output per unit of input (including labour) agricultural productivity rose between 1950 and 1960 in both North America and North-Western Europe by almost one-fifth. If this efficiency is expressed in terms of output per man, then the increase which occurred during this period is about two and a half times greater : also the rate of increase in output per man in agriculture has been in almost every country higher than that achieved by the rest of the economy, though the actual level of output per man in agriculture is lower than the national average almost everywhere.

NUMBER OF PERSONS SUPPLIED WITH FOOD AND AGRICULTURAL PRODUCTS BY ONE ACTIVE PERSON IN AGRICULTURE

	1950	1960
North America	19.2	31.3
North-Western Europe (incl. Italy)	7.9	10.4
Southern Europe (excl. Italy)	4.0	4.1
OECD area	7.4	9.2

Around 1950, one agricultural worker produced in the OECD area the food and other agricultural products needed by a little over 7 people, and by 1960 this had exceeded the figure of 9. Considering that the food consumed per capita nowadays in the OECD area is, in terms of quantity and quality, about one-sixth higher than that around 1950, then the increase in the efficiency of the agricultural sector could hardly be overestimated. The ratio of one to nine mentioned above conceals of course wide differences as between countries and regions : the ratio is highest in North America (about one to thirty) and lowest in the Mediterranean area (about one to four), which is due to the difference in natural resources and to the different stage of economic development reached by each country ; this latter point being reflected in the proportion of inputs other than labour entering the agricultural productive process. These differences are illustrated by the fact that the North American OECD region, with a total population of about eight times that of Turkey, has about one-half the farmers of Turkey; and that Italy with a population of about one-fourth that of North America, has about the same number of farmers as Canada and the United States together.

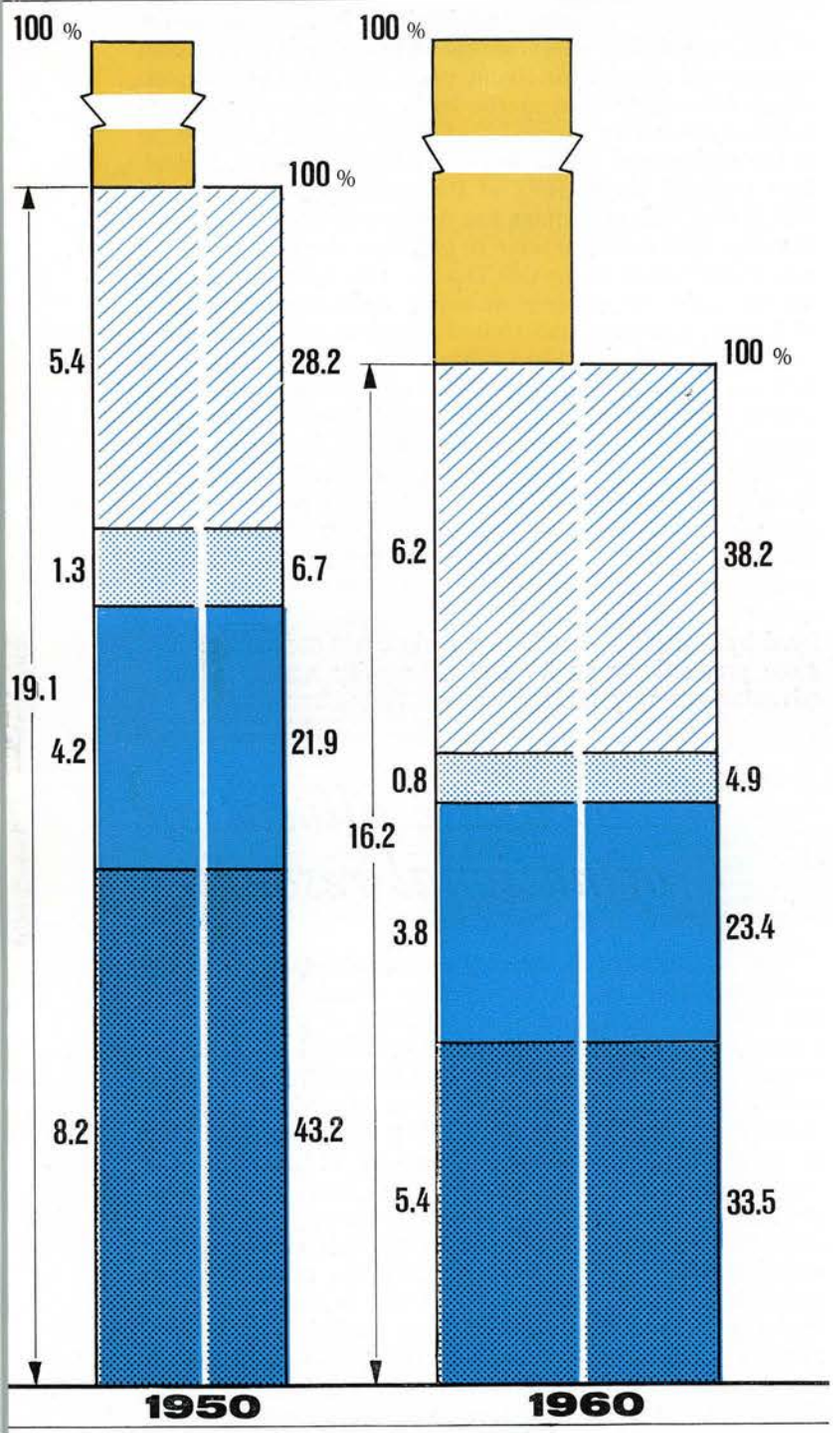
This increase in labour productivity is the consequence of the cumulative effect of knowledge acquired in recent decades and especially in recent years, and of the adjustments which have intervened in the entire structure of the agricultural productive apparatus of the area, and in particular in the agricultural labour force : while around 1950, agriculture occupied about 24 % of the active population of the OECD area, this percentage had dropped to about 20 in 1960. Between 1950 and 1960 some 10 million active persons moved out of agriculture in the OECD area ; this figure corresponds approximately to the present active agricultural population of France, Germany, the United Kingdom and the Benelux countries combined. Here again, wide differences exist as between countries, and the validity of these figures could be argued since a part of the agricultural labour force is only partly used in agriculture. Nevertheless, in almost every OECD country the " agricultural population " is decreasing at an average rate of between 2 and 3 % per year, with most countries being nearer to (and even above) 3 % than 2 %. The increasing efficiency of the agricultural sector combined with a strong and sustained rate of growth in the overall economy has made such an evolution possible. The labour freed by agriculture has been used in other occupations in a more productive way for the community and in a more advantageous way for the workers themselves.

Adequate allocation of national resources

But in almost every country about three-quarters of the total production is now produced by about one-quarter of the farmers. With a decreasing number of people in agriculture, and therefore with the decreasing importance of consumption on the farm itself, these figures are highly significant. Without entering here into an analysis country by country or commodity by commodity (the differences may be quite wide in some cases) the meaning of these figures is that a numerically much smaller agricultural sector could produce the goods which are now in demand; given the possible future increases in productivity, this smaller sector would also be in a position to satisfy the expected rising demand for food in the OECD area and in markets abroad. Under present circumstances it seems unlikely that present marginal production — a very high cost one — or rather the present marginal productive apparatus will be required in the future. It is also unlikely that this present marginal productive apparatus would be necessary even if outlets for agricultural products, whether commercial or on concessional terms, were to increase substantially in the future. A highly efficient and productive apparatus would be in a better position to satisfy any likely increased requirements.

Despite the diminution in numbers which has taken place in recent years, the agricultural sector still occupies in every country a much higher number of people than is necessary to produce the food and agricultural requirements. The work (most often hard work) performed by this excess labour can hardly be remunerated by the community in the way it

XPENDITURE FOR FOOD AS % OF GNP AND BREAKDOWN F THIS EXPENDITURE.



tes : The surface of the 1950 and 1960 columns is calculated on the basis of GNP at constant 1954 prices.
All percentages are calculated on the basis of current prices.

remunerates those people producing what it requires. It shows at the same time what is the main problem confronting agriculture itself and public opinion with regard to agriculture, as well as the nature of the problem. The problem is one of a satisfactory and successful integration by the community of these human resources in occupations producing the goods and services required by the community. The nature of the problem is principally not an agricultural one, but essentially a general economic and social one.

The integration of agriculture in the national economy

Agriculture is a purchaser of goods and services produced by other sectors. Between 1950 and 1960 the goods and services purchased by agriculture from other sectors for the production process increased in volume terms by about one-half. This again is a considerable amount. For some of the items used by agriculture, its purchases represent an important proportion of the sales on the domestic market by a particular industry : for example, for the European area as a whole, agriculture purchased in 1958 more than one-sixth of the domestic sales by the chemical industry; in the case of capital goods sold by the engineering industries, agriculture accounted for about 6 %, but purchases by agriculture have been increasing in the last decade much faster than total sales of this sector of industry.

This increase in purchased inputs has to be considered simultaneously with developments in the labour input in agriculture. In both North America and North-Western Europe the total inputs (in volume terms) used in agriculture have practically remained unchanged (in North-Western Europe there has been a 6 % increase in ten years), but an important two-way shift of almost equal importance has taken place. Agriculture as a sector of relatively declining importance is not increasing the amounts of resources it uses but is adjusting its structure and its productive apparatus in a way which allows the transfer of a particular resource to the most remunerative use. There can hardly be a better illustration of the growing integration of agriculture in the rest of the economy. To continue this process of integration, agriculture must have the necessary capital and the agricultural entrepreneur must have a fair degree of certainty about the financial return of his operations.

Expenditure on food

The importance of agriculture's contribution to the well-being of the community appears also from the fact that the rapid increase in agricultural productivity has enabled increased food supplies to be made available to the community at relatively lower prices, thus contributing to making food expenditures diminish relative to income. Around 1950 the OECD community (and here again the differences as between countries are rather great), used to spend a little under one-fifth of the area's gross national product for food. Out of this amount a little over one-fourth represented processing and distribution costs of this food, and a little under one-

fourth represented the purchases made by agriculture from the other sectors for producing this food; a little less than half was the part going to farmers to remunerate them and their capital for producing this food (a small part of the total expenditure for food was destined to pay for the net food imports coming into the area); the part left to farmers represented 8.2 % of total gross national product.

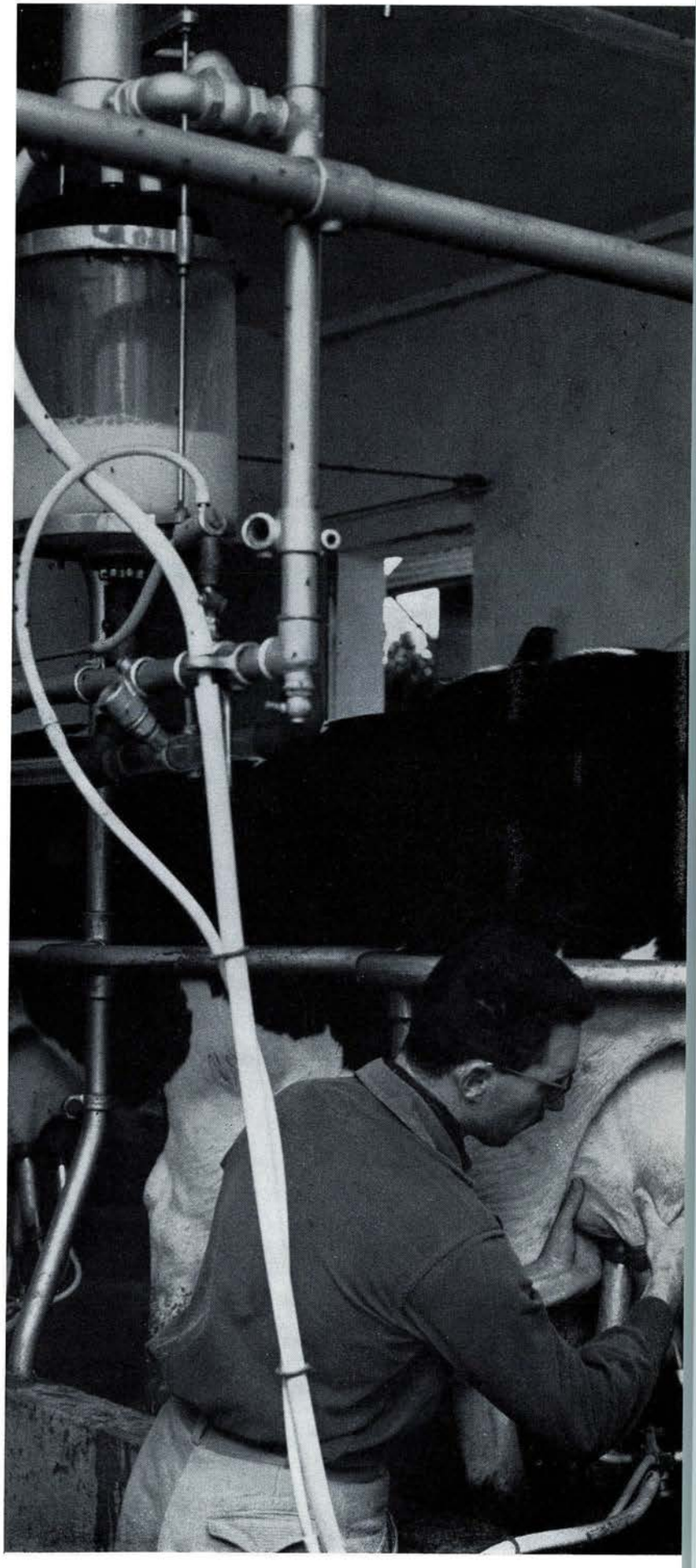
Around 1960 all these percentages had changed : the food expenditure represented less than one-sixth of the area's gross national product, and of this amount processing and distribution costs represented more than one-third, the current operating expenses of agriculture almost one-fourth, while one-third only was left to remunerate farmers' work and capital; this latter part represented 5.4 % of total gross national product. These sets of figures point to one of the fundamental reasons for the relatively unfavourable general income situation of the agricultural sector.

The farm income problem

An improvement of the situation of agriculture would come if things could change in a way to modify one of these elements. Should food prices increase, should processing and distribution costs contract, should imports diminish, should costs of agricultural inputs reduce, all this would certainly have a beneficial effect on farmers' income. But the scope for such changes is limited (and often undesirable) for several reasons :

- The possibilities for increasing the relative prices of food are limited because of their effects on increased cost-of-living stimulus to higher protection for national agriculture with consequent harmful effects on trade and reduced consumption. While demand for food reacts slowly in the more advanced countries to price reductions, many countries have experienced a quick slackening of consumption following a large increase in prices.
- The contraction of processing and distribution costs, particularly in those countries where these sectors are deficient, might allow farmers to obtain a larger share of the consumer food dollar, but once processing and distribution are improved, the scope for the contraction of these expenditures is small, as with rising incomes consumers will want increasing amounts of services. The way to make agriculture benefit, therefore, is to make it no longer a producer of primary goods only but also to control the further stages up to the consumer; this would necessitate a group discipline imposed by the farmers on themselves.
- The reduction of inputs other than labour does not appear to be in line with long-term developments in a growing economy : as an economy reaches a certain stage of development — and most OECD countries have already reached it — labour tends to become more expensive relative to capital. Agriculture, if it wishes to follow the general level of technology of a country and not lag behind, tends to replace capital for labour until it reaches that mixture of resources which would give the highest returns to both capital and labour.
- Foreign trade has itself an important role to play in promoting overall economic growth. In addition to contributing to the best use of resources internationally, increased trade should provide countries, which depend upon their agricultural exports for earning their necessary foreign exchange, with a fair opportunity to maintain and even expand their outlets.

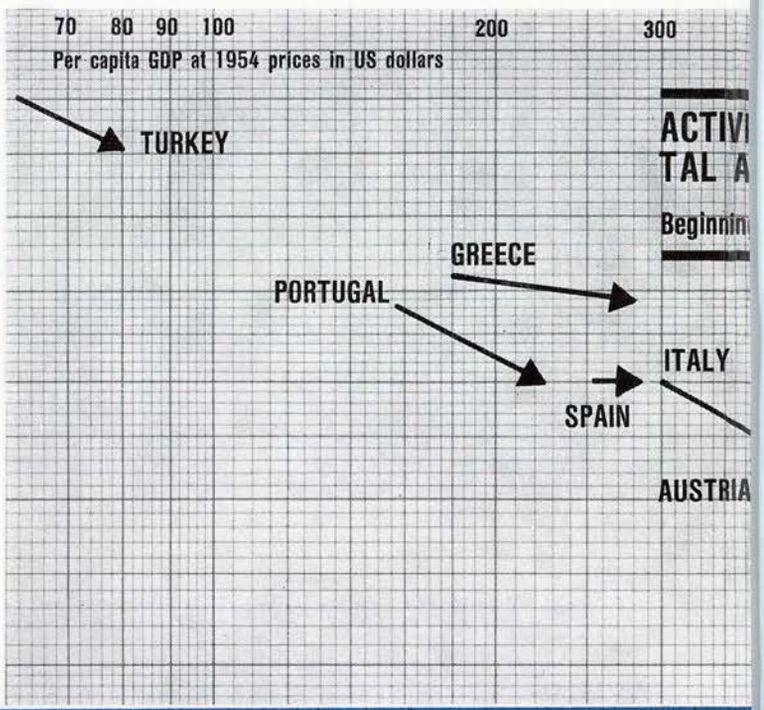
The following points should also be noted :

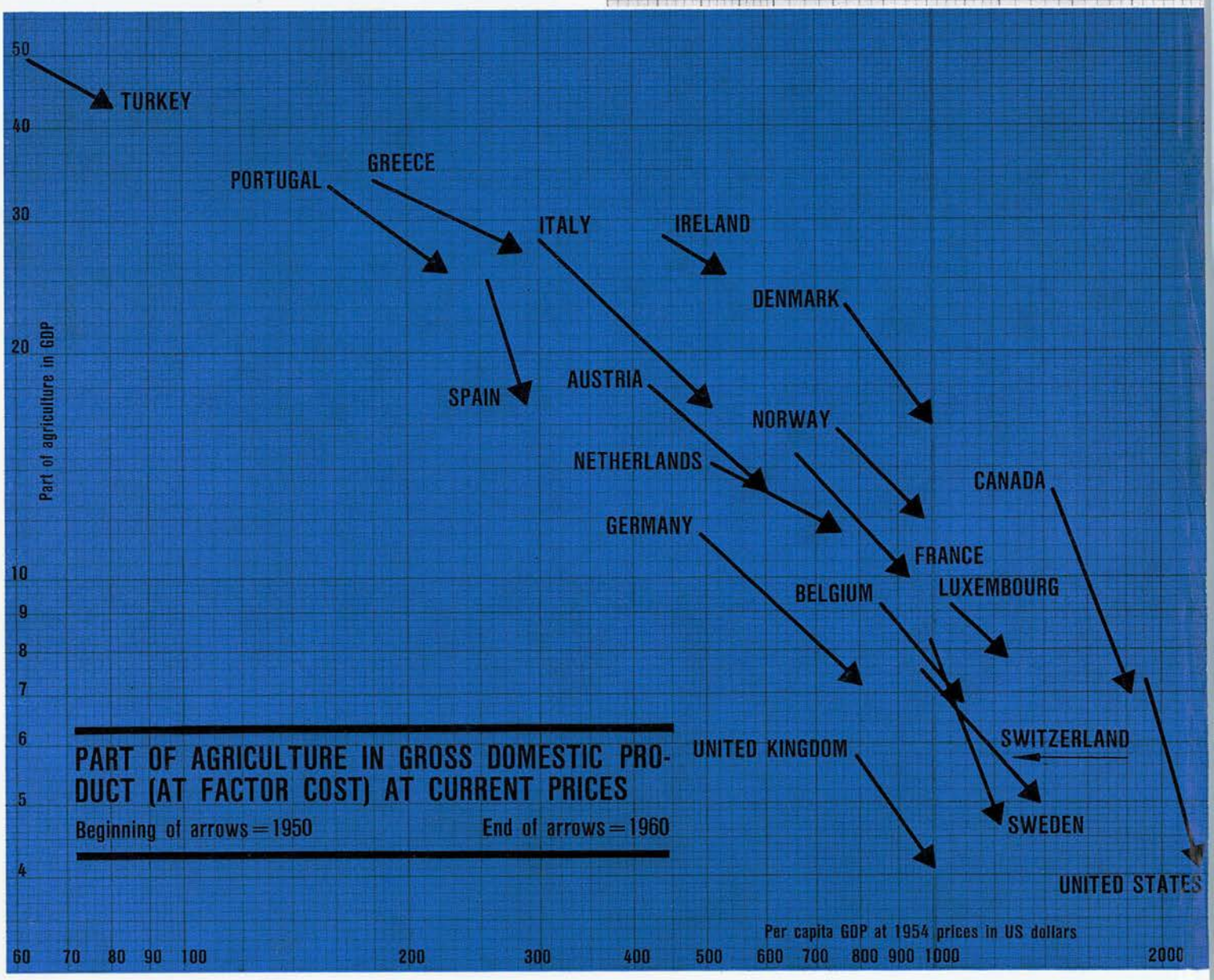


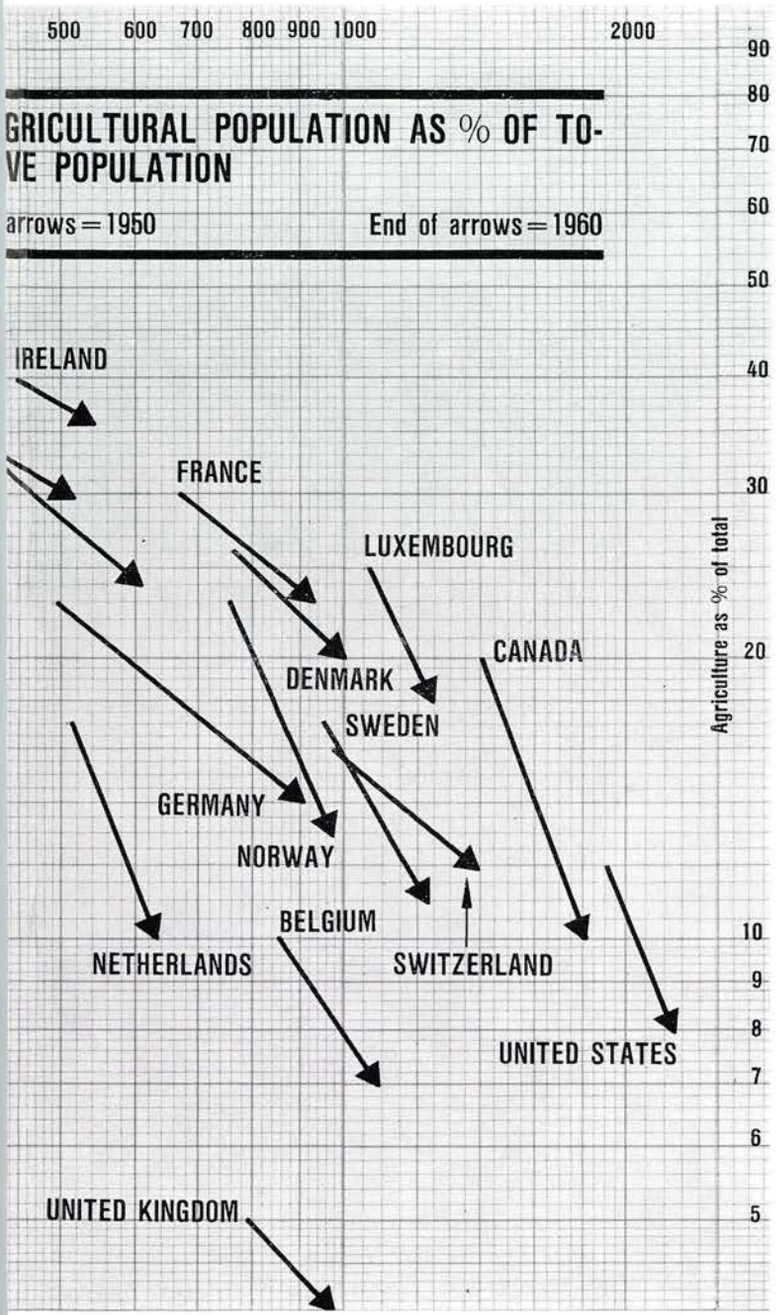
• Expenditure for food during the' fifties rose between one-fifth and one-sixth quicker than the quantities of food consumed, this difference being accounted for by increasing processing and distribution costs; while food expenditure has been rising at a slower rate than gross national product, processing and distribution costs have been rising faster and even quicker than gross national product itself.

• To produce a given quantity of food around 1960 it was necessary to use about one-fifth more purchased inputs than in 1960 (from outside the domestic agricultural sector) while the total volume of inputs required (including labour) was one-fifth smaller; this development consequently leaves a proportionately smaller part of the value of production to the farmers. Gross product of agriculture has been rising at a little over one-quarter of the rate of increase experienced by gross national product.

The part of agriculture in the area's total gross national product diminished by one-third between 1950 and 1960, whereas the agricultural population diminished during this period by about one-fifth. This discrepancy in the two rates, coupled with the initial income differential between agriculture and the rest of the economy, is at the root of present-day agricultural problems.







Economic development and the size of the agricultural sector

The declining share of agriculture in gross national product, despite the income support measures taken in favour of agriculture, is a natural phenomenon and a corollary of growth itself : there is nothing abnormal about it and all countries and societies experience it. So also is the declining proportion of agricultural population in total population.

How the rates of diminution of these two percentages are accelerated by economic growth is shown in the diagrams. Between 1870 (earliest period for which any fairly comparable figures can be obtained) and 1950, Europe had never experienced a long-run average annual rate of growth higher than 2.2 % (this was achieved in the periods 1870-1890 and 1925-1938), but between 1950 and 1960 the area as a whole realised an annual compound rate of growth of 4.7 %. During the four decades preceding 1950, no single European country had experienced an average rate of growth higher than the one experienced since 1950. The North American countries, despite their already high level of development, have been growing since 1950 at an average rate of nearly 3.5 %. It is therefore understandable that the necessary adjustments which agriculture has to undergo at the present time are particularly large. While this adds to the problems — and particularly social ones — of the sector, the rapid rate of growth in other sectors gives agriculture a good opportunity for rationalising its operations and for increasing the efficiency with which it uses its resources.

The rapidity with which the proportion of total population in agriculture diminishes constitutes one of the fundamental factors making for agricultural incomes to be relatively satisfactory or unsatisfactory. In the long run, it is only the downward trend of this percentage that can bring a permanent improvement to the income situation of the agricultural sector, while at the same time making a real contribution to overall growth if this labour released from agriculture could be used more efficiently in other sectors of the economy.

The challenge to society

The problems confronting agriculture are not inherent in agriculture alone : they are inherent to any relatively declining sector, and such sectors can be found in any branch of the economy. What is peculiar to agriculture is the size of the problem, the difficulties in proceeding with the necessary adjustments and the revolution which economic growth brings to the notion of agriculture : from a way-of-life, agriculture tends to be considered by both farmers and non-farmers more and more primarily as an economic activity.

Overall growth, to which agriculture should continue to contribute, should also solve the problems — economic and human — that are created by the process of successive adjustments inherent in any growing economy. The community has a responsibility towards all its members : this responsibility is to alleviate the hardships of the individual and also to enable each individual to take advantage of what the community can offer; for it does not happen necessarily that the individual can always take advantage of what the community is in a position to offer. If the community, thanks to growth, creates new jobs at the right place and trains the available under-employed or inefficiently employed human resources to take advantage of these new opportunities, then a solution to the income problem of agriculture will become easier. The road to this passes through general education, professional training, social integration : three elements, the importance of which can scarcely be over-estimated.

The creation of new employment possibilities and the fitting of the people to the new jobs involves a high social cost, and in the particular case of agriculture, it may under certain circumstances be more expedient and more satisfactory for the community to keep the middle-aged and older farmers on their farms to ensure them a decent living — rather than to move them somewhere else. Such cases, and in many countries they may be quite numerous, should no longer be considered as being the responsibility of agricultural policy but should be handled by the community in the framework of its social endeavours. Purely agricultural problems could then be tackled in a more rational way.

TO BE PUBLISHED SHORTLY

"AGRICULTURE IN WESTERN EUROPE CRISIS AND ADAPTATION SINCE 1880"

by Michael TRACY
(Jonathan Cape, 396 pages, 55 s.)

This book, which is to appear this month, by a member of the OECD Agricultural Policies Division, traces developments in Western European agriculture during the Great Depression of the late 19th century and the economic crisis of the 1930's. Mr. Tracy demonstrates how failure to adapt sufficiently flexibly to the changing pattern of world needs has led to the preservation of an archaic farming structure, resulting in the problems of low farm incomes, expensive subsidies, etc.

After analysing the present agricultural policies of Western European countries, Mr. Tracy shows the need for adaptation to modern conditions, while pointing out that this should not involve undue hardship to the farming community.

Mr. Tracy sums up : ... " the fact today is that farmers themselves, rightly or wrongly, are caught up in the race of higher standards of living, and that they cannot all achieve this aim by remaining in agriculture. Keeping a large agricultural population by means of an expensive and permanent subsidy from the rest of the community is hardly the way to preserve the sense of independence which is regarded as one of the assets of the farmer. The answer to this problem, therefore, is to be found not in further retarding the inevitable shift from agriculture to other sectors, but in a forward-looking policy which would ensure that the new industrial society is more desirable than the old. "

A LITTLE-KNOWN ASPECT OF INDUSTRIAL RESEARCH

by R. SCHWOB
Vice-Chairman
of the OECD Committee
for Scientific Research

THE growing impact of scientific and technical research on present-day standards of living and, in particular, its decisive role in the process of economic growth, are no longer disputed.

But this awareness — a development contemporary with the splitting of the atom and the conquest of space — is usually limited to the more striking aspects of research, that is to say, those which directly foster technical progress. As concerns industrial research this means discoveries based on pure and applied science which lead to the improvement of existing products and processes and, more important still, to entirely new products and processes.

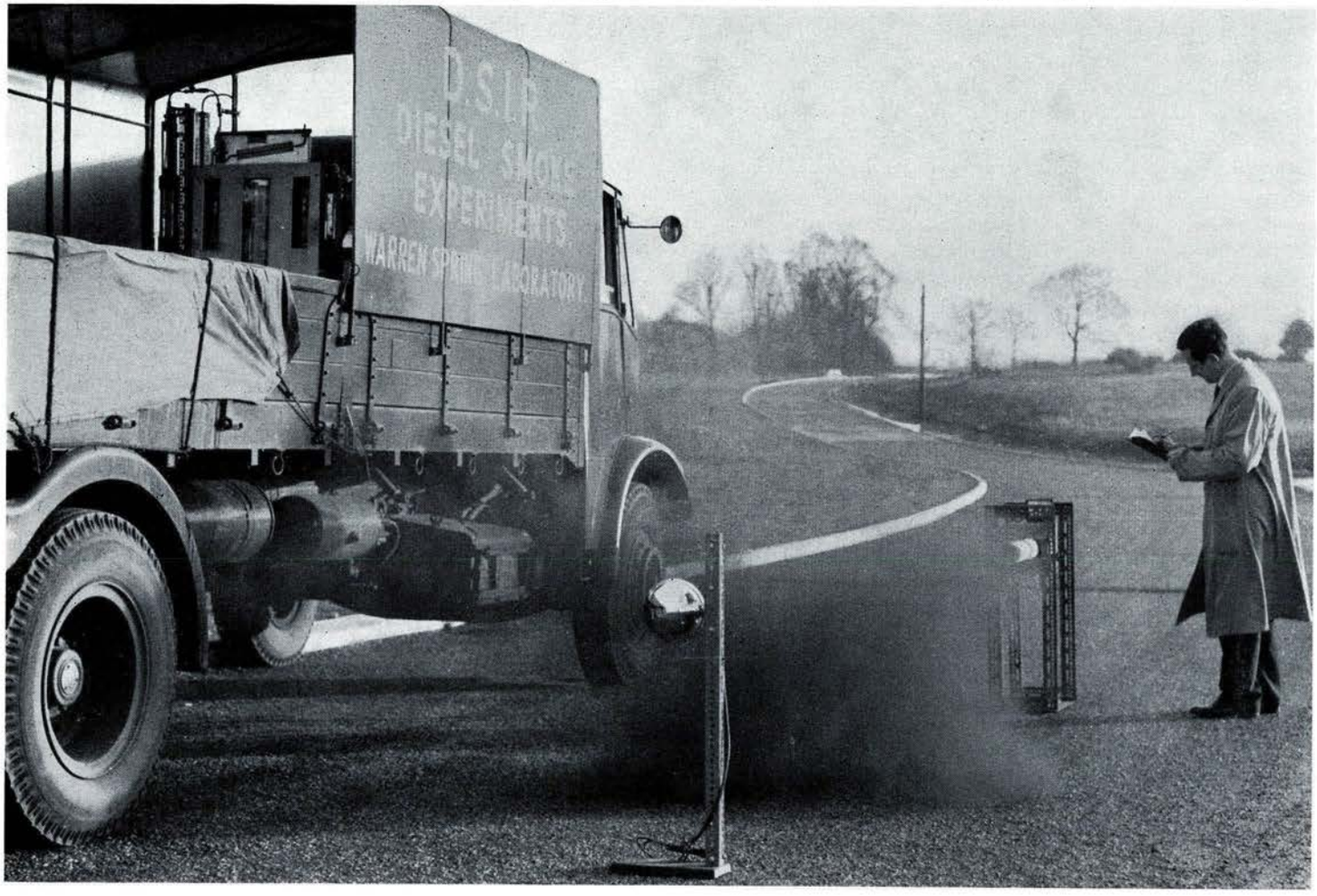
There is however another type of industrial research, not so spectacular, but of hardly less economic and social importance.

To take an instance, certain kinds of research not *directly* concerned with improving production do none the less contribute substantially to such improvement in the long run by showing how to remove various constraints which might have hampered progress.

A further example is research designed to eliminate, or at least reduce, some of the harmful effects of technical progress, by combating the various " nuisances " which the application of scientific discoveries has brought increasingly in its wake, and which we have unwittingly allowed to become one of the plagues of our civilisation.

This research, of an often obscure

Research is in progress on methods of measuring smoke from vehicles, especially when climbing a steep hill with a heavy load.



and thankless nature, lies concealed from the general public in the shadows cast by technical progress as it speeds on its way.

A few examples will make clearer the kind of problems involved.

One type of problem consists of the constraints which hamper the development of technical progress; these arise mainly from the vulnerability of matter to deterioration from countless sources, that is to say in practice the various kinds of damage affecting the materials used by technologists.

This includes fatigue failure, wear, corrosion and biological fouling of common metals, wear of road surfaces, and the biological deterioration of many organic, natural or synthetic materials.

The investigation of these problems and the search for effective methods of protection alone account for several important and complex sectors of industrial research which stand in close relation to certain aspects of pure science, particularly in the field of solid state physics.

Technical progress also entails harmful effects for the ordinary citizen and this raises fresh problems for the research scientist. Examples are not difficult to find. They include air-pollution in towns and villages due to motor traffic and factory smoke; sea and river pollution caused by oil, synthetic detergents and all kinds of industrial effluents (to say nothing of atomic waste); industrial noise and in particular the noise caused by aircraft; greater risk of fire resulting from the instability of new chemical compounds; hazards arising from the increase in road traffic, and the dangers to human health entailed by the use of certain chemicals for the protection of crops.

This list, though by no means exhaustive, clearly illustrates the importance of this work, for not only is the well-being of the population at stake but often its health and sometimes even its survival.

On considering how investigations of this kind can best be tackled and successfully dealt with, it soon becomes clear that

they have a number of features in common which can help the authorities concerned to choose the right approach and methods.

In the first place, there is nothing spectacular about the work : it is usually a thankless task, consisting mainly in the painstaking development of methods of identification, measurement and control adapted to the problems to be studied. Because of their complexity, and the many factors involved, studies of this kind often extend over very long periods. Lastly — and this is even more important — the results are sometimes difficult to assess and even difficult to notice, for they do not bring positive benefits like those obtained from direct technical progress, but " negative " benefits such as the elimination of an impediment or nuisance, or sometimes even preventive measures against future troubles.

Secondly, research of this kind is not usually competitive in the way that direct production is, although it may later become so when the findings lead to the recommendation of certain safety devices or protective products rather than others.

Lastly, and this is of special importance, *the research in question is of joint or even general interest :* it does not serve individual or small sectional interests, but caters for broad occupational sectors, large consumer or user groups, and sometimes even for the whole population of a regional or national community.

It follows from these remarks that the government authorities of each country simply cannot dissociate themselves from this research in view of the collective or national importance of the problems involved. In practice moreover they alone are in a position to undertake this research and carry it through, as it is seldom concerned with matters of direct interest to private industry.

Hence work of this kind is usually done in government or professional laboratories, or at any rate financed from public funds.

No less important consideration is that this research is a most suitable field for *international co-operation.* There are many reasons for this; first, its non-competitive character removes one of the main obstacles to co-operation in this field; secondly the fact that the research is of general interest means that, in each country, it is handled by government or professional laboratories between which international contacts can fairly easily be arranged; lastly, research of this kind covers so wide a field of science and technology, is so complex, and is likely to extend over so long a period that an international approach is most appropriate and what is more, particularly convenient, since a division of labour is essential and there is a reasonable prospect that this will involve very little difficulty in the way of intricate or troublesome demarcation disputes.

This explains why, during the last ten years or so, the Committee for Applied Research of OEEC, and later the Committee for Scientific Research of OECD, have devoted the best part of their international co-operative research activities to the fields under review : in fact, *all* the research subjects listed above are dealt with in varying degrees under the co-operation programmes drawn up by these two committees.

The methods which have been patiently developed and perfected for making international co-operation of this kind as effective as it can be have been frequently described in the last few years and the OECD Central Service for International Co-operation in Scientific Research is sufficiently well-known. The OECD does not directly subsidise research but simply helps the laboratories of Member countries to carry out combined activities in this field by providing various administrative and financial facilities for the groups of experts set up for this purpose : payment of experts' travelling expenses, secretariat and interpretation expenses, translation and circulation of documents, cost of full or part-time technical secretariat for groups.

This method, which can be described as catalytic, has proved its worth : at very little cost (roughly one million francs a year for all the activities listed above) it enables OECD to promote international co-operative research in a great many sectors.

Moreover, the carrying out of the research itself does not generally involve any additional cost for the countries concerned; the work is done in laboratories which would have handled it in any case, but under less satisfactory conditions if there had been no voluntary international co-ordination. The *qualitative* value and efficiency of this form of co-operation are very much greater than those of more conventional procedures.

The importance of the research work needed to deal with constraints and " nuisances " will undoubtedly become rapidly more important in the next few years. This is in fact a vast new field of activity, typical of the times, the scientific and technical aspects of which deserve prompt and serious consideration.

At both national and international co-operative level, physical and intellectual resources must be allocated on a scale in keeping with the volume and complexity of the research required, and also with the importance of the outcome of this research from the economic, social and human standpoints.

ESTABLISHMENT OF OFFICIAL RELATIONS BETWEEN OECD AND UNESCO

Agreement has been reached between the Organisation for Economic Co-operation and Development (OECD) and the United Nations Educational, Scientific and Cultural Organisation (UNESCO) for the establishment of a formal relationship between the two Organisations. Under the terms of this Agreement, both Organisations will determine by common consent those sectors of their activities which are deemed to be of common interest and to call for an exchange of information and documents. These sectors might include, among others, science and technology, education, the social sciences, and technical assistance, in all these fields, to developing countries.

The special interest of OECD in these sectors is directed mainly to its contribution towards economic expansion and to development assistance. That of UNESCO is on a wider and more general basis. It aims at contributing to peace and security through education, science and culture " in order to further universal respect for justice, for the rule of law and for the human rights and fundamental freedoms... for the people of the world ". To this end it works for popular education, for economic and social progress through science, for the spread of culture, and the encouragement of co-operation in all branches of intellectual activity.

During its existence of seventeen years UNESCO's membership has risen from 44 to 113, ranging from most of the major nations of the world to some of its smallest and most recently emergent. Its governing body is the General Conference of Member States which meets every two years at UNESCO's Paris headquarters to approve the programme and the budget drawn up by the Director-General and his international staff. The General Conference elects an Executive Board of representatives of thirty Member States to supervise the execution of the programme and advise the Director-General between its sessions.

In its programme, UNESCO gives priority to education. In its endeavour to develop and improve education throughout the world it devotes special attention to educational planning, construction of school buildings, training of teaching personnel, printing of textbooks, and use of new teaching methods. Its proposed World Literacy Campaign — designed as a major contribution to the UN Development Decade — aims at instructing two-thirds of the world's 500 million adult illiterates. The General Assembly of the United Nations will consider at the end of 1964 the means of financing such a Campaign.

UNESCO's natural sciences programme, whose importance almost equals that of education, gives primary emphasis to the application of science and technology to the economic development of the less-developed countries. The programme is concentrated on : development of the basic structure of science in all the Member States and international co-operation in the promotion of scientific research and in the application of science to economic development. Areas of science to which special attention is given are : hydrology, oceanography, seismology, soil sciences and conservation of natural resources.

In the field of the social sciences special attention will be given to certain fundamental questions of special importance to the promotion of human rights and the consolidation of peace. The three main areas are : race prejudice, the economic and social problems newly independent countries are faced with, and the economic and social consequences of disarmament.

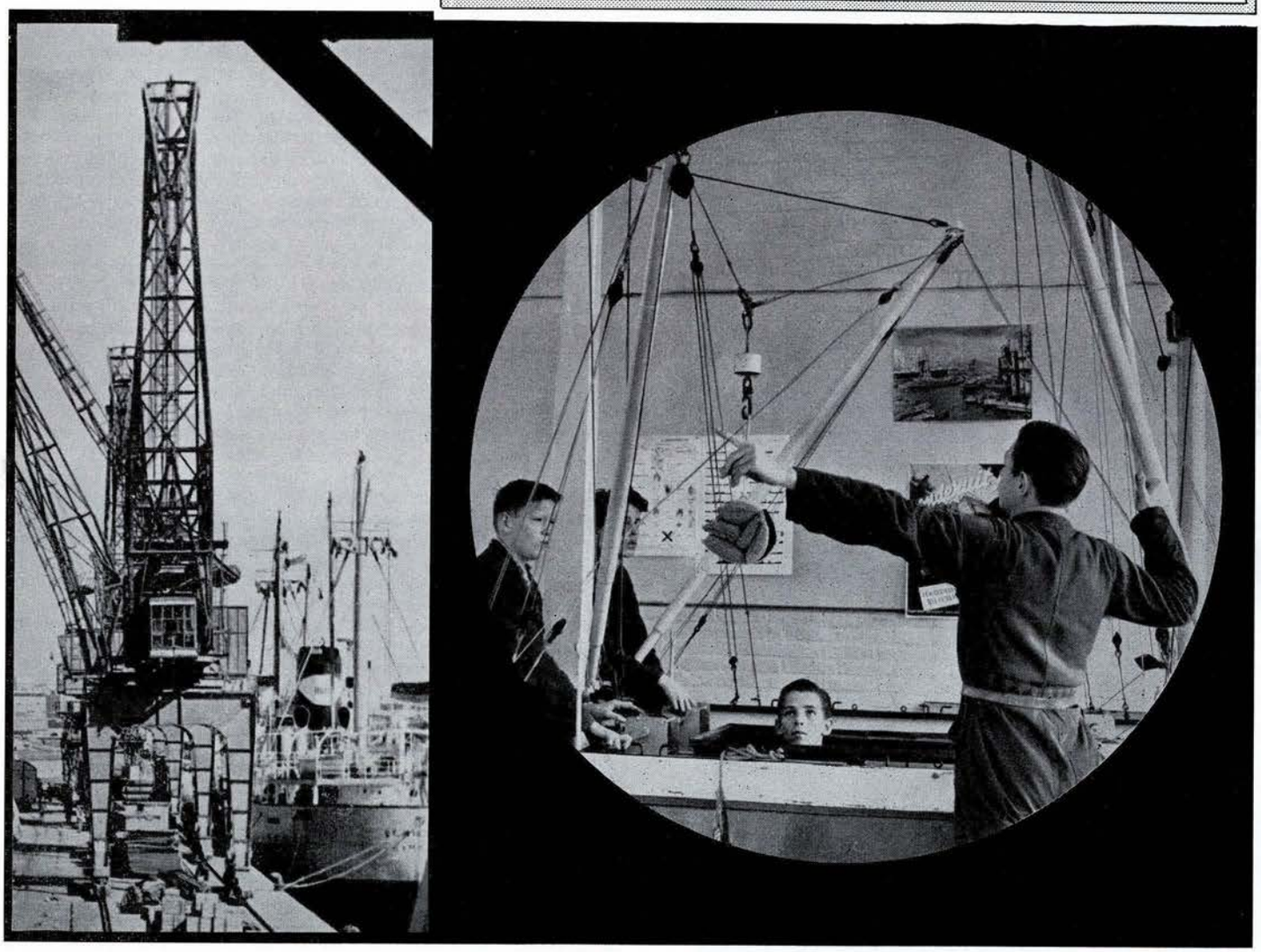
Among the cultural activities of UNESCO is one which has aroused wide popular interest and which demonstrates what can be achieved by international co-operation in saving the world's treasures for posterity: the bodily removal and re-erection of Nubian temples — and in particular the great rock-temples of Abu Simbel — whose sites will eventually disappear below the waters of the High Dam of the Nile. This project has been successfully achieved as a result of voluntary contributions by some fifty Member States outside the framework of the Organisation's regular budget.

Other aspects of UNESCO's programme in the cultural field include : a universal history of the scientific and cultural development of mankind of which the first volume has recently been published, translation of classics and of representative works written in less widely spoken languages, implementation of the Universal Copyright Convention, and development of libraries and museums.

Finally, in the field of mass communication, UNESCO works to promote the free flow of information and the expansion of means and techniques of mass communication. Some 2,000 million people in developing countries are still lacking adequate information possibilities. UNESCO's plans would help to bring them, in 12 to 15 years' time, to an acceptable minimum level as far as information media — press, radio, TV, film — are concerned.

The new link between OECD and UNESCO will be one of mutual co-operation from which both Organisations will benefit; and it will ensure the avoidance of overlapping in the areas in which they share a common interest.

An experiment in TRAINING FOR PORT-WORKERS



A constant effort has been made to improve working methods in the 2,500 year old Port of Piraeus with its 3,000 workers and 7,700 m. of wharfage. The controlling agency, the Port of Piraeus Authority, is now engaged in improving the overall efficiency of the personnel working in and for the Port. Specialised training courses, practical teaching courses for employees, a complete inventory of existing equipment, publication and distribution of the regulations governing the working of the P.P.A., and many other measures have been taken with this in view.

One aspect has claimed the particular attention of the authorities : the vocational training of dockers, specialists and foremen working in the Port. There are two main reasons for this.

Job and Safety

Public opinion, in Greece as elsewhere, does not consider that a docker's job is properly speaking a trade; this feeling is met with even among a number of dockers. Even in official publications, dockers are classified as unskilled labour. Two years ago, Daniel Dagallier, Director of the Centre d'Information de la Manutention (Paris), in a report prepared for the European Productivity Agency of the OECD pointed out that " although the docker is considered the equal of other workers from the social point of view, he does not rate so high from a technical standpoint. It is widely held that the job requires only a minimum of theoretical knowledge and that physical strength is still the predominant factor. "

Another no less important reason is safety. Many accidents occur because of carelessness. A docker is supposed to be able to carry out all sorts of tasks on the quays. Without experience or training, he cannot work quickly without damaging goods or equipment, and above all, without risk to himself and his fellow workers.

Mechanisation and the greater emphasis on specialisation means that training of the docker must be based on a pre-established plan designed to make him understand what he has to do and make him more aware of his responsibilities.

The Greek authorities, anxious to organise such training, asked for the services of an OECD consultant. The latter, Mr. A. Peters, Director of Vocational Training at the School for Port Workers in Rotterdam, therefore made an on-the-spot survey and drew up a number of recommendations. These are mainly directed towards forming a department of vocational training under one director to deal with all matters relating to training.

Four Phases

The gist of the consultant's recommendations was that basic training of dockers should last for thirteen weeks, nine of which should be spent with mixed cargoes, three with bulk cargoes and one with cereals; the first phase would include a certain amount of training in night work. Teaching theory, which must always be backed up by demonstrations and practical work, includes explanations on all matters relating to the Port of Piraeus, its organisation, the handling of mixed or bulk cargoes, the principal regulations, etc.

The second phase is devoted to the training of checkers; this may include checkers already in service and dockers who have completed basic training successfully; the length of the course is thirteen weeks for the former, and twenty-six weeks for the latter. Training, with written and oral exams at regular intervals, deals with the role of the checker, procedure relating to maritime trade, the main imports and exports, etc.

The training of deck gangs and fork lift truck drivers is also included in the second phase. The third phase concerns the basic training of foremen who may eventually go on to receive further training in their own special branch (warehousing, hoisting, checking, handling, etc.), in the fourth and final phase.

The example of Rotterdam

During his talks in Greece, Mr. A. Peters recalled that the relevant authorities in the Netherlands were for a long time preoccupied with the question of training. In 1949 the Port of Rotterdam Shipowners Federation (" Shipping Federation South ") set up a vocational training department for the Port. Since 1953, the Council of the Institute of vocational training for dock workers has taken over what previously devolved on the said Committee.

As far as the training of adults is concerned, nearly 6,000 have followed training courses and enrolled in one or more of the organised phases. The experience acquired during this teaching has revealed a certain number of shortcomings in the original planning (programmes laid too much emphasis on purely technical questions, the average age of the pupils was too high) and the necessary adjustments were carefully examined.

It was found possible to improve training appreciably by making it available to much younger people. This led to the starting of the Rotterdam School for young dockers. The three aims of the school — pedagogic, technical and social, are being achieved by a series of innovations, i.e. by applying the principles of youth movements : teams, uniforms, discussion groups; and using new methods of instruction.

The experiment undertaken at Rotterdam, as regards both apprentices and adults, cannot be applied entirely to Piraeus because the two ports have developed under different circumstances. As, however, the need for vocational training of port workers has now been fully recognised, the movement can only expand.

RECENT OECD PUBLICATIONS

NEW THINKING IN SCHOOL BIOLOGY

This, the latest in the "New Thinking in School Science" series, is the product of a seminar at which 90 representatives of the administrative, university and school sides of education, from 20 countries, met to discuss problems of school biology education.

The first part deals with the case for reform of biology teaching : the role of biology in general education and for the future citizen and future biologists ; the experimental approach; and problems of biology education in Europe.

The second part — new approaches to curricula — discusses reform of biology teaching in teachers' colleges; the place of ecology in biology teaching; mathematics for biologists and in the study of biological science ; and reform in universities.

School biology in OECD countries is the subject of the third part, which contains country reports dealing with these countries and with Yugoslavia, Brazil and Columbia.

328 pages (demy 8vo) : US $ 3, 17s. 6d., F 12, Sw. fr. 12, DM 10.

CHEMISTRY TO-DAY

All too often the teaching of science and mathematics in secondary schools is based on curricula which have taken little account of the rapid advance of science of the last few decades, and adopts a descriptive approach which appears to the student to have little relation to the dramatic products of contemporary science with which he is in daily contact. OECD has therefore collaborated with groups of school teachers and university professors who are interested in adjusting the curricula of mathematics and science to the state of present knowledge. This Guide for Teachers is one of the results. It is not a textbook, but seeks to help improve the teaching of chemistry by presenting new concepts to the teachers. Among the topics discussed are: an experimental approach to the periodic system; atomic structure; chemical bonds and molecular structure; chemical kinetics; why chemical reactions occur; biochemistry; nuclear chemistry.

365 pages (demy 8vo) : US $ 3,50, £ 1, F 13,50, Sw. fr. 13.50, DM 11.

SUPERVISION OF PRIVATE INSURANCE IN EUROPE

Government supervision of private insurance in Europe presents many differences in scope and method which interfere with the operations of insurance concerns in international business ; nor are they well known among the different countries of Europe. With the twofold object of explaining the various systems of supervision and of doing something towards removing the differences between them, the Insurance Committee of the OECD undertook the comparative study of "Supervision of Private Insurance in Europe".

After an historical review, and a study of basic concepts, this report deals with supervision of the concern and contracts of insurance, and also with duties, taxes and other compulsory contributions, and the organisation of supervision and professional organisation. An annex contains a comparative study of classes of direct insurance recognised by Member countries' supervisory authorities and a number of summary tables dealing, for example, with financial guarantees required from insurers. A separate volume contains country chapters.

Each volume : US $ 9, 55 s., F 37, Sw. fr. 37, DM 30.

TOURISM IN OECD MEMBER COUNTRIES 1963

The substantial flow of tourists among OECD Member countries continued to increase in 1962 at an encouraging rate. All Members participated in this expansion, the increase in the number of European tourists travelling to North America being particularly noteworthy.

In its report, which covers the development of tourism in Member countries and Yugoslavia in 1962 and the early part of 1963, the Tourism Committee has included many tables to illustrate the trend of tourist movements in each of the countries concerned. Together with a survey of international tourism in Member countries, the report discusses the economic importance of tourism, tourist receipts and expenditures in foreign currency, domestic tourism, the staggering of holidays, government action, transport, accommodation and tourist facilities.

107 pages (crown 4to) : US $ 1,75, 10 s. 6d., F 7, Sw. fr. 7, DM 5,80.

ORGANISATION AND STRUCTURE OF THE MILK MARKETS IN OECD MEMBER COUNTRIES

Food and Agriculture Documentation Series No. 55

A need has long been expressed for a comprehensive, factual and detailed analysis of the structure of the milk markets of OECD Member countries. Such an analysis, including an examination of the possibilities of stabilising the market for dairy products and of bringing about an international integration in solving many milk marketing problems, is the object of this report.

The report follows a survey of the organisation and structure of the milk markets in 18 Member countries carried out by Professor Dr. E. Esche, of Kiel, Germany, where it was discussed at an International Seminar on the Organisation and Structure of the Milk Markets in OECD Member Countries held in November, 1961. It includes chapters on the improvement of dairy economies, on the influence on income distribution of the market position of the marketing partners, of the influence of government intervention on the milk market, and on integration aspects of national European markets.

545 pages (demy 8vo) : US $ 5, 30s., F 20, Sw. fr. 20, DM 16.50.

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