

# the OECD OBSERVER

## OECD Declaration on Relations with Developing Countries

**M**INISTERS of OECD Governments meeting in Paris on 28th May, 1975, discussed relations with developing countries and agreed that, in the present situation, the widest measure of international co-operation is required.

They considered that while many developing countries have made major progress in their economic and social development, a large number of them have not been in a position to advance sufficiently and many are still faced with extremely severe problems of poverty.

Recalling the contribution which their countries have made to further the economic development of the developing countries, Ministers resolved to intensify their efforts to co-operate with these countries in their endeavours to improve the conditions of life of their people and to participate increasingly in the benefits of an improved and expanding world economy.

Given the fact of world economic interdependence, they believed that progress could best be made through practical measures which command wide support among all concerned — developed and developing nations alike.

They determined to consider policies aimed at strengthening the position of the developing countries in the world economy and expressed their willingness to discuss with the developing countries the relevant issues, with particular emphasis on food production, energy, commodities and development assistance for the most seriously affected countries.

They therefore expressed their firm determination to pursue the dialogue with the developing countries, in all appropriate fora, in particular the forthcoming Seventh Special Session of the United Nations General Assembly, and in more restricted fora along the lines suggested by the President of the French Republic, in order to make real progress towards a more balanced and equitable structure of international economic relations.

# the OECD OBSERVER

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*The Declaration reproduced on the cover was adopted by OECD Ministers meeting in Paris on May 28. It gives a clear indication of the political will of Member countries to make further progress towards strengthening the position of the developing countries in the world economy and to pursue a constructive dialogue with these countries in all appropriate fora.*

# MINISTERIAL DISCUSSIONS AT OECD



*Opening Session of OECD's Council Meeting at Ministerial Level, May 28, under the chairmanship of The Rt. Hon. James Callaghan, MP, United Kingdom, Secretary of State for Foreign and Commonwealth Affairs.*

## OECD Council at Ministerial Level

### Communiqué

*The Council of the OECD met at Ministerial level on 28th May, under the chairmanship of the Right Honourable James Callaghan, MP, United Kingdom Secretary of State for Foreign and Commonwealth Affairs, and on 29th May, with the Right Honourable Denis Healey, MBE, MP, United Kingdom Chancellor of the Exchequer, in the chair.*

### The Economic Situation

Ministers expressed confidence that the policies of OECD governments will lead to a recovery of demand and employment and that this will be combined with further reductions in the average rate of inflation. They are determined to achieve these goals, and to ensure, by timely adjustments of policies, that the recovery is under-pinned should this prove necessary, and that, once under way, it does not degenerate into a new period of excessive demand pressures and inflationary tendencies. Ministers noted that the substantial international payments deficit on current account of OECD countries as a group, which has recently declined,

is nevertheless likely to persist for some years. They also underlined the importance of ensuring that economic policies are such as to secure, among OECD countries, a less unbalanced distribution of current account positions, more compatible with a sustainable pattern of capital flows. Given such policies, Ministers were confident that, backed by official bilateral and multilateral arrangements, the financing of existing and prospective deficits could be continued on an orderly basis; in this connection they welcomed the steps being taken to obtain early ratification of the agreement establishing the OECD Financial Support Fund.

Ministers stressed that policy decisions concerned with the immediate future had to be related to the foreseeable medium and longer-term problems of structural change, and to broad strategies for resolving them. Ministers agreed that the OECD should carry forward and accelerate its re-assessment of the prospects for sustained economic growth and the constraints on such growth, particularly those arising from inflation, under the changing circumstances. They noted with interest the proposal made by the United States Government that a number of economists of international repute should be invited, drawing on this work, to

**MINISTERIAL DISCUSSIONS AT OECD**

*French Minister of Foreign Affairs, Jean Sauvagnargues.*



*OECD's Secretary General, Emile van Lennep, and United States Secretary of State, Henry Kissinger, who also participated in the meeting of the International Energy Agency on May 27 (see page 10) as did Ministers of other Agency Members.*



examine the policy issues and make recommendations. In a broader and longer run context, Ministers also noted with interest a proposal initiated by the Japanese Government for a study of the future development of advanced industrial societies in harmony with that of developing countries.

**Trade**

Ministers decided to renew, for a further period of one year, the Declaration adopted on 30th May, 1974, stating the determination of all OECD governments to avoid recourse to new restrictions on trade and other current account transactions and the artificial stimulation of visible and current invisible exports. (\*) In renewing the Declaration, Ministers stressed that the present situation required a high degree of economic co-operation. Noting that there had been a marked difference in the balance-of-payments situations of OECD Member countries, they welcomed the economic measures taken by certain of them; and they reaffirmed that, in the present state of the world economy, it remained of the highest importance to follow an economic policy which combatted inflation but also aimed at maintaining a high level of employment and expansion of world trade. The way in which this policy should be implemented must take account of the respective situations of Member countries.

Ministers agreed that, given the importance of the terms of export credits in international competition, an arrangement of a general nature in this respect, between as many as possible of the industrialised countries of the OECD, should be achieved. This would constitute significant progress in international co-operation. They also agreed on the need to continue close consultations on exchange-rate developments in the appropriate bodies. They noted that the problems of the developing Member countries have become more serious in several respects during the past year, and deserve to be considered with special attention within the OECD.

(\*) *The Government of Portugal is not, at this stage, in a position to renew the Declaration.*



*Above : Federal Minister of Economics, Hans Friderichs and Federal Minister for Foreign Affairs, Hans-Dietrich Genscher, Germany.*

*Left : Danish Minister for Foreign Economic Affairs, Ivor Nørgaard.*

*Right: OECD's Secretary General, United States Secretary of the Treasury, William E. Simon, and The Hon. Denis Healey, Chancellor of the Exchequer of the United Kingdom.*

## MINISTERIAL DISCUSSIONS AT OECD

Ministers reaffirmed that liberal and expanded trade was of the utmost importance for the further development of the world economy and that, to this end, they would work together for the success of the multilateral trade negotiations now under way.

### Energy

Ministers stressed the importance they attached to continuing and developing co-operation in the field of energy. A report from the Belgian Foreign Minister, Mr. Renaat van Elsende, Chairman of the Governing Board of the International Energy Agency's meeting at Ministerial level on 27th May, described the progress being made and the new impulse given to energy co-operation within that body.

Ministers agreed that increased co-operation between producer and consumer countries was needed in order to ensure equitable and stable conditions in the world energy market.

### Commodities

Ministers stressed that adequate supplies of commodities at equitable and remunerative prices are essential to the world economy. They recognised the interdependence and common interest of producers and consumers, both developed and developing countries, particularly in relation to the avoidance of excessive fluctuations in commodity markets, as well as the importance attached by producers to assure access to markets and by consumers to secure supplies. These questions, together with other aspects of the commodity problem, are of special concern to the developing countries in making the best possible use of their natural resources to foster economic development.

In responding to the concerns of developing countries in the commodity field and while recognising that circumstances vary greatly between commodities or groups of commodities and that this must be taken into account when working out practical arrangements, Ministers agreed on the need for a more active and broadly based approach to commodity problems aiming in particular, at:

- reducing market instability and promoting a better balance between production and consumption, including, where appropriate, through commodity agreements;
- ensuring adequate levels of investment in production of commodities;
- improving and increasing market outlets and local processing of commodities.

In addition, Ministers indicated their readiness to consider improved international mechanisms to stabilize export earnings of developing producing countries.

Ministers stressed the need for progress in the various international discussions on grains. In this context they noted that the better agricultural crops expected this year offered the opportunity to begin rebuilding stocks of essential foodstuffs, notably grains, and to ensure greater world food security. Ministers also reiterated their readiness to contribute to the efforts needed to increase food production in the developing countries.

Ministers agreed that these questions should be pursued actively in all appropriate bodies with a view to reaching concrete solutions based on co-operation between producing and consuming countries. They welcomed the establishment of a high level group in the OECD to further develop Member countries' attitudes both on general aspects of their commodity policies and on specific action concerning particular commodities.



Above: Irish Minister for Foreign Affairs, Garret Fitzgerald; President of the Commission of the EEC, François-Xavier Ortoli; French Minister for Economy and Finance, Jean-Pierre Fourcade.

Below: Vice Chairmen of the Meeting: (left) Japanese Minister for Foreign Affairs, Kiichi Miyazawa; (right) Ernst Brugger, Federal Counsellor, Head of the Federal Department for Public Economy of Switzerland.



## Relations with Developing Countries

Ministers adopted an OECD Declaration on Relations with Developing Countries (see Cover). They further agreed on a review within the OECD of economic relations between Member countries and developing countries, with a view to identifying what new and other constructive approaches could be adopted on selected substantive issues, and to giving support and new impetus to negotiations in other bodies working on specific problems. Ministers invited the ad hoc high-level Group which has been created for this purpose to begin its work as quickly as possible and to submit a preliminary progress report before the end of July 1975.

Ministers agreed on the need to continue the dialogue between developed and developing countries. They recognised that, concurrently with the problems of energy and oil, there are other problems such as commodities, including foodstuffs, development questions and the intensified difficulties of the most seriously affected countries, which will have to be tackled with increased vigour in co-operation with all countries concerned. The need for renewed efforts along these lines was a recurring theme throughout the meeting of the OECD Ministers. Ministers expressed the hope that their deliberations will have provided a basis for the resumption at an early date of the dialogue which was initiated in Paris last April.



### The Rt. Hon. James Callaghan,



*MP, Secretary of State for Foreign and Commonwealth Affairs of the United Kingdom and Chairman of the OECD Council Meeting at Ministerial Level on 28th May reports on the first day's proceedings.*

**W**e have been reviewing our problems and our policies in the widest possible setting and their ramifications not only for OECD Members but for the world as a whole. The thread that has been running through our discussions is, if I may borrow one of Dr. Kissinger's phrases, that we are examining the architecture of the world as we now see it developing. The fact that we are all Members of the OECD is itself a recognition that national economic decisions cannot be taken in isolation. Co-operation through the OECD, as we have been reminded, is itself a legacy of the great Marshall Plan which did much to mitigate the worst consequences that were feared for the post-war situation. The Thirties have not been repeated in our countries.

I see no reason for us to be apologetic in our generation for the institutions that we set up after the Second World War and which have served to provide a quarter of a century of unparalleled growth in the world as it stands. But there is no doubt that those institutions and policies have been increasingly challenged by the developing nations who represent the vast majority of the world's peoples, and they are not here at today's conference table.

That is why it is so important that we should examine in a constructive spirit the issues of how to strengthen and improve relations between the OECD—that is to say the industrialised countries of the world—and the developing countries. There have been many proposals for examining matters concerned with trade, commodities, foodstuffs, financing and the transfer of technology to these countries, and we have agreed on the urgency of examining these questions, especially with the Seventh Session of the United Nations Special Assembly and the other forthcoming meetings in mind.

More specifically we have agreed on a Declaration on relations with developing countries. Many of us felt that this was an especially important moment if, indeed, not a decisive moment. We have felt that the way in which the atmosphere built up at the last United Nations Assembly boded ill for future political developments, that we were getting into a sterile confrontation between developed and developing countries about the theoretical idea of whether we were going to try to reform the existing world order or build a new world order. Those of us who are concerned with practical matters felt that this was no way to help the people of the developing world in their aspirations. And, therefore, we felt it was important to send a message—to hoist a flag—to the developing countries that they can read and that is what this Declaration is. What we are saying to the developing world is this. We know you are faced with extreme poverty. We wish to work with you to find solutions to overcome that poverty. We want to use practical methods and we believe that this is the best way to help strengthen the developing countries, to remove their poverty, to improve their conditions, even whilst we use the existing structures to do it.

We have also decided on a review within the OECD of economic relations between Member countries and developing countries with a view to identifying what new and other constructive approaches could be adopted on selected substantive issues and to give support and new impetus to negotiations in other bodies working on specific problems. So we are hoping to avoid sterile rhetoric and confrontation and to move into a phase of practical co-operation.



### The Rt. Hon. Denis Healey,



*MBE, MP, Chancellor of the Exchequer of the United Kingdom and Chairman of OECD's Ministerial Council on 29th May, summarised that day's discussions on relations between the developed countries—on economic policy generally, and on trade policy.*

**I**n contrast with last year, all OECD countries are now giving first priority to the restoration of economic growth, based on the full use of resources and manpower available. Many delegates expressed the view that the fact that OECD countries between them now have 14,000,000 unemployed people represents an economic waste and a human tragedy for which democratic countries cannot easily accept responsibility.

The focus of our discussion was whether or not we can expect

an early recovery in world economic activity, how soon it will begin and how fast it will proceed thereafter. Everyone was confident that the upturn is now on the way, but some concern was expressed about its timing and pace, and one delegate was a little anxious in case it should start and then peter out because there was not a sufficient continuing stimulus of demand to keep it going.

Many, particularly the smaller countries, thought that if there were no clear signs of recovery being under way in a few months time there would be a very strong case for further reflationary measures by the stronger economies. Everyone agreed, I think, that if the recovery were delayed much beyond the next few months, the stronger economies would come under irresistible political pressure to do too much, too late, as in fact did happen in 1971 and 1972. We all agreed that this was in very large part responsible for the fact that the last boom produced excessive and unacceptable inflation in all the OECD countries and led inevitably to the downswing from which we are now suffering.

Many of us have felt that it is a pity there was not more general recognition a year ago of the threat of recession posed by the policies of that time because it takes a minimum of six—and many would say an average of eighteen—months before fiscal stimuli to the economy have any general effect on the level of activity and trade. We are suffering this year from the failure of many countries to recognise the depth and duration of the current recession. On the other hand, of course, if governments panic before the measures they have already taken have a chance to take effect, there is a risk that the next boom, like the last one, will lead to unacceptable inflation and a very rapid collapse in economic activity such as we are seeing today.

The next issue we discussed was the problem created by the extraordinary disparity in economic performance between the various Members of OECD, particularly in the areas of unemployment and inflation. Some countries, like Britain, have seen a very small fall in output: the OECD pointed out that the United Kingdom has seen a four per cent fall compared with 20 per cent in Japan over the last year and 10-15 per cent in the United States, France, Germany and Italy. On the other hand, Britain has a very high rate of inflation, accompanying this comparatively modest fall in output. And we recognise that these differences in national situations will require different economic policies. Countries like Britain, Italy and Ireland accept the fact that, with inflation at current levels, their prime problem is to bring the rate of inflation down, because it is causing unemployment and discouraging investment.

On the other hand, the political consequences for them will be very difficult to accept if the stronger economies fail to take sufficient reflationary action and the weaker economies therefore remain unable to compensate for the shortfall in domestic demand with a substantial increase in their exports. What emerged very clearly today—and it is the first time it has been stated in these terms by a number of national delegations—is that a failure by governments adequately to stimulate domestic demand can do just as much damage to the level of international trade as the conventional ways of interfering with imports and exports.

On the other hand, the differences in performance by the various countries may help the world to escape the major problem it faced during the last boom: the fact that there was an almost total synchronisation of the economic upswing in all the industrial countries led to a very high and indeed excessive demand for raw materials and produced the commodity boom, international inflation and inevitably, in its train, the severe slowdown in economic activity, from which we are now suffering. There was an area of disagreement among Ministers on whether or not, if countries do not have uniform economic policies and similar levels of economic performance, greater flexibility is required in international monetary arrangements.

One thing that emerged during the discussion, and which was not foreseen by any of us, was that a number of delegations put very great importance on the need to deal with problems of structural adjustment both inside individual countries and between the rich countries as a whole and the less developed countries. They stressed that effective co-operation in the macro-economic field is not likely to be sufficient unless there is appropriate action in the micro-economic field as well, on matters like the stimulation of industrial investment in the appropriate sectors and the development of labour market policies such as for example are already pursued in Sweden.

From this general discussion we passed to a short discussion of the renewal of the Trade Pledge. Everyone has taken this Pledge very seriously. This is reflected, in a sense, by the fact that the Portuguese government chose to say that it would not renew the Trade Pledge for another year because it could not guarantee to fulfil it given the particular economic difficulties it faces. Many countries are very concerned that, if the stronger economies fail to stimulate demand, they are damaging world trade just as much as the weaker countries would be by introducing some interference with the free market in exports and imports. Several countries having made this point, however, all the Members of the Council except Portugal renewed the Pledge.

## **OECD Member Countries Renew their Trade Pledge for a Year**

**A**fter examining the current economic situation, the Governments of OECD Member countries decided to renew, for a further period of one year, the Declaration stating their determination to avoid recourse to restrictive trade measures.

The overall position of the world economy has not changed fundamentally since the same period last year when Member countries adopted this Declaration, more commonly known as the *Trade Pledge* (see below):

- the overall deficit on the balance of payments, and in particular current balances of the OECD countries, still persists, although it has recently become smaller;
- the problem of inflation persists despite a significant improvement in average rates;
- the level of economic activity and hence the employment position have deteriorated;
- international trade is slowing down.

## MINISTERIAL DISCUSSIONS AT OECD

Furthermore, despite significant differences between countries, the difficulties are general in nature. Consequently, any country trying to redress its own deficit would be bound to do so at the expense of another Member country. There is, therefore, still a danger that unilateral trade measures will become general and give rise to a worsening both in the position of the OECD area taken as a whole and in that of each of its countries.

The *Declaration*—which also applies to measures concerning invisible transactions—is part of a more general framework of economic co-operation within the OECD.

The Financial Support Fund which was set up within the Organisation will provide support for the Declaration and will complete the defensive system set up to cope with the dangers inherent in the present situation.

### DECLARATION

#### Adopted by the Governments of OECD Member countries on 30th May, 1974(\*)

Considering that, among other factors, the rise in oil prices is aggravating the economic problems confronting Member countries, and notably the problem of inflation, as well as causing additional structural problems, and that it is creating an unprecedented change in the structure of the balance of payments and, in particular, a deterioration of current accounts of Member countries as a whole ;  
Considering that all Member countries are affected by these developments though in varying degrees ;

#### AGREE :

that the nature and size of the above-mentioned problems facing Member countries as well as a number of developing countries call for wide co-operative action in the fields of economic, trade, financial, monetary, investment and development policies ;

that the financing of international payments deficits will constitute a difficult problem for certain Member countries and that, accordingly, Member countries will co-operate fully to facilitate such financing and are ready to consider appropriate arrangements which may prove necessary in this respect ;

that unilateral trade or other current account measures by one or more Member countries to deal with this situation would aggravate the problems of other countries and, if generalised, would be self-defeating and have a depressing effect on the world economy ;

that countries have responsibilities both as importers and exporters to avoid disruption of regular trade flows ;

that, as a matter of urgency and without prejudice to the outcome of the monetary and trade negotiations, there is therefore a need for a joint undertaking having as its objective to prevent new unilateral action which may have a detrimental impact on international economic relations ;

DECLARE THEIR DETERMINATION, in the light of the foregoing and for a period of one year,

(a) to avoid having recourse to unilateral measures, of either a general or a specific nature, to restrict imports or having recourse to similar measures on the other current accounts transactions, which would be contrary to the objectives of the present Declaration ;

(b) to avoid measures to stimulate exports or other current account transactions artificially ; and, inter alia, abstain from destructive competition in official support of export credit and aim at taking appropriate co-operative actions to this effect in the immediate future ;

(c) to avoid export restrictions which would be contrary to the objectives of the present Declaration ;

(d) to consult with each other, making full use of the general procedures of consultation within OECD, in order to assure that the present Declaration is properly implemented ;

(e) to implement the present Declaration in accordance with their international obligations and with due regard to the special needs of developing countries.

(\*) Including the European Communities.

# SOME BASIC DATA

## New OECD Machinery for E

OECD Trade in Industrial Raw Materials  
by Product (a) - 1973  
(\$ billion)

Commodity Groups	Imports (b)		Exports	
	Total	of which: from Third countries	Total	of which: to Third countries
Hides and skins	2.21	0.60	1.88	0.32
Natural Rubber	1.16	1.16	—	—
Wood	10.07	4.36	5.28	0.22
Pulp and Paper	3.13	0.15	3.25	0.47
Natural Fibres	6.34	2.27	4.23	0.99
of which: Wool	3.32	0.22	2.67	0.24
Cotton	2.20	1.34	1.43	0.74
Jute	0.12	0.11	—	—
Crude Fertilisers	3.13	1.01	1.99	0.28
of which: Fertilisers	0.56	0.41	0.13	0.03
Metalliferrous ores	9.08	4.10	4.39	0.12
of which: Iron ore	4.14	1.96	1.78	—
Non-ferrous ores	4.52	1.98	2.37	0.07
Other Crude Materials	2.41	0.71	1.74	0.18
Non-ferrous metals	14.25	5.34	10.46	1.61
of which: Copper	6.42	3.15	3.77	0.59
Nickel	1.02	0.13	1.06	0.16
Aluminium	2.66	0.31	2.82	0.47
Lead	0.43	0.10	0.39	0.07
Zinc	0.75	0.16	0.73	0.14
Tin	0.67	0.56	0.15	0.05
Total of above	51.77	19.70	33.23	4.20
Total trade	410.31	102.72	398.48	97.58

(a) Excluding New Zealand trade with non-OECD countries, figures for Australia and New Zealand are partly estimated.

(b) F.o.b. for Australia, Canada and the United States.



# TA ON RAW MATERIALS

## Examining Commodity Problems

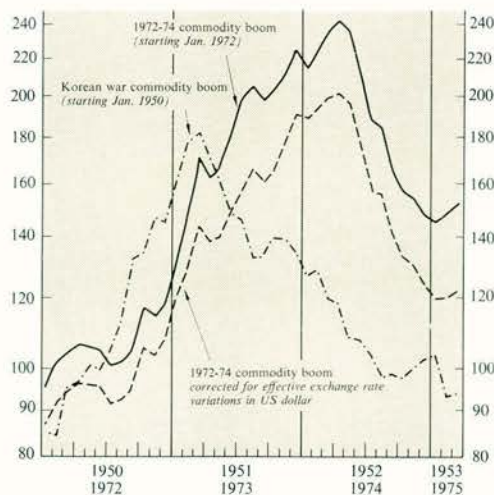
During the meeting of OECD's Council at Ministerial level on 28-29 May, the Ministers agreed on the need for a more active and broadly based approach to commodity problems aiming in particular at:

- reducing market instability and promoting a better balance between production and consumption, including where appropriate, through commodity agreements;
- ensuring adequate levels of investment in production of commodities;
- improving and increasing market outlets and local processing of commodities.

In addition, the Ministers indicated their readiness to consider improved international mechanisms to stabilize export earnings of developing producing countries.

A high level group has been created under the aegis of OECD's Executive Committee in Special Session to further develop Member countries' attitudes both on general aspects of their commodity policies and on specific action concerning particular commodities.

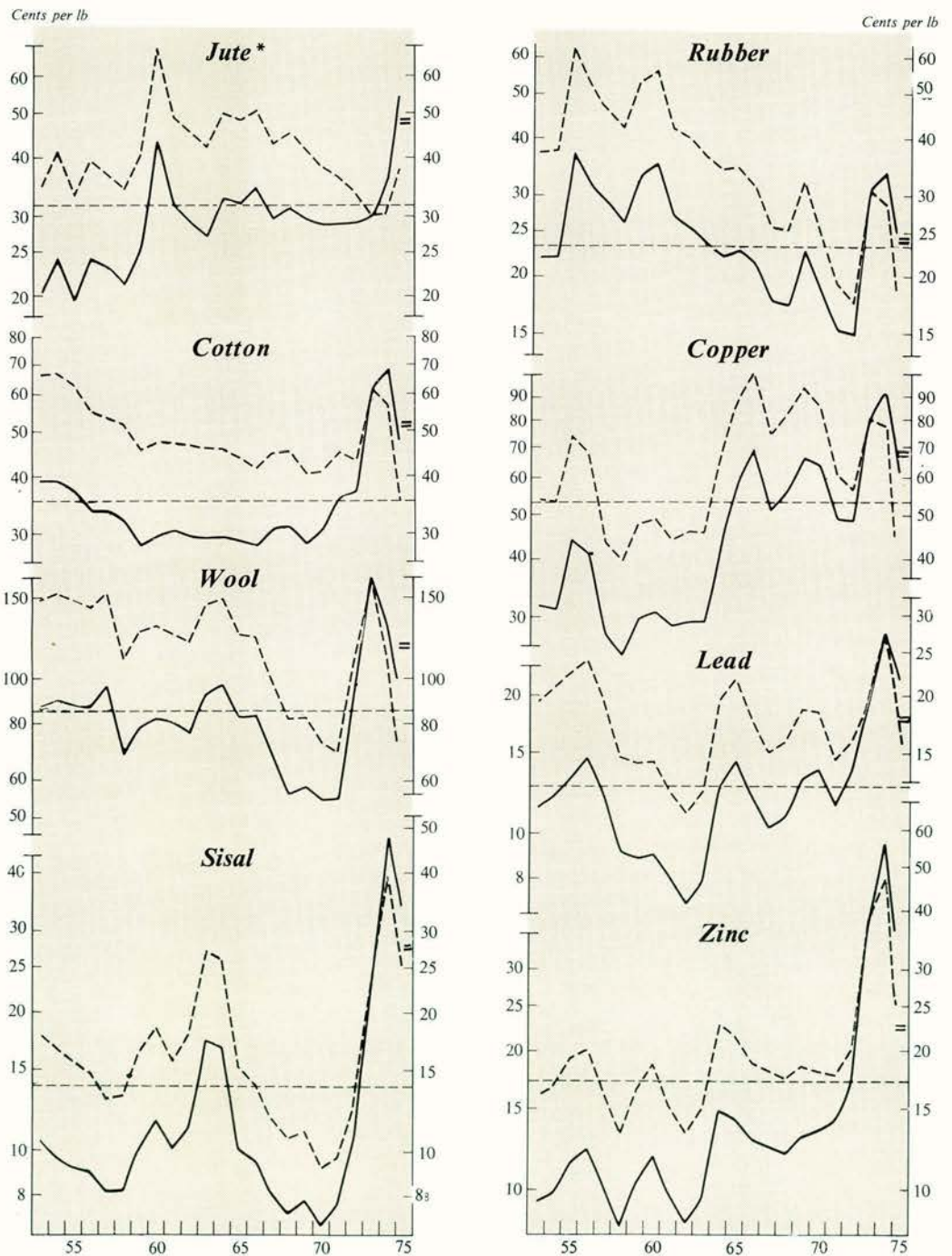
**Economist's Industrial Materials Price Index**  
1970 = 100



**Selected Commodity Prices - 1953-75**

Semi logarithmic scale

--- in 1973 prices  
— Current prices  
- - - average 1959-74



# Meeting of the International Energy Agency Governing Board at Ministerial Level

*The Governing Board of the International Energy Agency met at Ministerial level in Paris on 27th May, 1975, under the Chairmanship of Mr. Renaat van Elsende, Minister for Foreign Affairs of the Kingdom of Belgium and issued the following communiqué:*

**M**inisters noted that the events of recent years have highlighted the importance for the world economy of a regular and stable energy supply. Solutions to current economic problems must rest upon the principles of inter-dependence of all countries, mutual support and shared responsibility, so that all countries, whatever their level of development, may be recognised as partners in the world economic system. Their continued economic and social development must be based upon world economic growth in conditions of stability and equity.

Ministers reiterated their determination that the Agency should contribute, as far as problems connected with energy were concerned, towards achievement of these objectives.

Ministers reviewed developments in the world energy situation since the establishment of the Agency on 15th November, 1974. They laid down guidelines and priorities for the Agency's future work and for the full implementation of the International Energy Program and re-affirmed their commitment to work for the development of a co-operative multilateral relationship among oil producing and oil consuming countries.

They noted with approval that an emergency system has now been established to reduce oil consumption and to allocate oil supplies in conditions of shortage. This emergency system can be brought into operation at short notice if required, and will substantially reduce the economic effect of any future oil supply difficulties. They noted the importance of emergency reserves to ensure the effectiveness of the emergency system, and noted that the Governing Board would reach a decision by 1st July, 1975, as to the date by which these emergency reserves should be raised to 90 days supply.

Ministers noted the importance of the collection and analysis of information on the oil market in order to ensure greater understanding and transparency in international oil trade. They agreed that the oil market information system should be promptly completed and evaluated.

Ministers confirmed their determination to begin the implementation of a programme on long-term co-operation on energy by 1st July, 1975, with a view to achieving the overall objectives of the Agency by making more efficient use of the world's limited available resources of energy in the interest of the world economy; by diversifying the sources of energy; and by reducing dependence on imported oil.

Ministers agreed that co-operation in the Long-Term Program, to be equitable and effective, should take into due



Left to right : OECD Secretary General Emile Van Lennep; Chairman of the Governing Board of the Agency, Etienne Davignon; Belgian Minister for Foreign Affairs and Chairman of the meeting, Renaat van Elsende; and, Executive Director of the Agency, Ulf Lantzke.

consideration the specific economic and social conditions of Member countries. The program should ensure that the burdens and benefits deriving from joint efforts of participating countries are shared among them on an equitable basis, and that policies directed at achieving such a balance should be implemented within existing legislative and constitutional limitations. They further stressed that the overall efforts and undertakings of each participating country with respect to energy conservation, production of energy and research and development in the energy field should be regularly reviewed within the Agency.

Ministers noted with satisfaction the progress that has been made in the field of conservation, in particular through the adoption of a group conservation target for 1975.

Ministers decided that the work of the Agency should be actively continued, and agreed that governments of the participating countries would need to increase their efforts to ensure that the energy conservation objectives of the Agency are achieved.

Ministers laid down as priorities for future work :

- the consideration of conservation objectives for the group for 1976 and 1977;
- the establishment of medium-term goals for 1980 and 1985; and
- the intensification of individual country reviews to strengthen the effectiveness of conservation programmes.

## MINISTERIAL DISCUSSIONS AT OECD

The Ministers agreed on the need to elaborate a co-ordinated programme of co-operation for the accelerated development of alternative energy sources as provided in the decision already taken by the Governing Board, including in particular a commitment to increase, encourage and safeguard investment by general and specific measures.

The Ministers agreed that the Agency should initiate promptly an examination of the potential for expanded co-operation in the area of nuclear energy. This co-operation in all fields will be directed towards ensuring the development of this important alternative source of energy with due regard to safety and environmental conditions. Amongst other questions shall be discussed the availability of nuclear fuel and technology to meet the problems of safety and waste management.

On the basis of the above mentioned decision Ministers insisted on the importance of the establishment of co-operative projects in the research and development fields specified in the International Energy Program Agreement, particularly coal and nuclear questions. In this connection, they agreed to build further upon the progress already achieved by the Agency in the area of energy research and development. They resolved that productive results in this area will require a sustained effort to develop concrete international co-operation. In support of this objective, they agreed that a special session of the Governing Board, with attendance by senior research and development officials, should be held in the Autumn of 1975 to complete the formulation of a research and development program.

Ministers reviewed the relations among oil producing and oil consuming countries, developing and developed alike. With this in view they were aware of important and pressing problems of the developing countries which are not directly related to energy, and they were determined that these should be tackled with political determination and within a reasonable time-frame. Ministers noted that the Council of the OECD meeting at Ministerial level on May 28th and 29th proposed to discuss the problems of development and of commodities, including foodstuffs, and expressed the hope that steps will be taken towards effective action for finding solutions to these problems. For its part, the Agency will do all within its competence to work for the solution of the problems of the developing countries, so far as they are concerned with energy.

Ministers noted that the Preparatory Meeting held in Paris from 7th-16th April, 1975, had provided an opportunity for full and serious discussion of the means of establishing closer relations among oil producing and oil consuming countries.

Ministers declared themselves ready to pursue discussions at any time and in any manner found mutually convenient, and reaffirmed their common willingness to continue the dialogue and to encourage initiatives directed towards further progress.

Ministers exchanged views on possible ways of pursuing the dialogue. They agreed to continue bilateral contacts with interested countries. They instructed their representatives in the Governing Board to address these questions as a matter of urgency, to co-ordinate their efforts to ensure that formal deliberations responsive to the interest of all countries concerned can be held as soon as possible, and to examine the manner in which the dialogue should be continued.

Ministers agreed that the work carried out in the Agency thus far has made an important contribution towards meeting the difficulties that have been encountered in the energy field. They stressed the importance of the solidarity among the Member countries, and emphasised the need for an intensification and,

wherever possible, a broadening of co-operative efforts undertaken in this area. Acting in its operational capacity, the Agency will continue to develop further its co-operative energy pro-

### 1974 Energy Consumption and Oil Imports

1968-73 annual growth rate  
and 1973-74 percentage change

		Total Primary Energy Require- ments	Oil Imports	GDP
Canada	68-73	6.7	(1)	5.2
	73-74	4.3		3.7
United States	68-73	4.6	20.0	3.6
	73-74	— 2.3	— 2.2	— 2.0
Japan	68-73	9.4	13.8	9.5
	73-74	— 2.2	— 5.0	— 1.8
New Zealand	68-73	n.a.	n.a.	n.a.
	73-74	1.3	2.0	3.5
Austria	68-73	7.1	14.6	6.4
	73-74	— 1.9	— 6.0	4.5
Belgium	68-73	5.2	6.7	5.5
	73-74	— 3.9	— 13.4	4.0
Denmark	68-73	4.0	5.9	4.7
	73-74	— 7.8	— 5.4	2.0
Germany	68-73	5.5	8.1	5.1
	73-74	— 3.2	— 9.1	0.6
Ireland	68-73	8.4	11.5	4.6
	73-74	1.7	4.0	1.7
Italy	68-73	7.8	8.0	4.3
	73-74	2.1	— 2.4	3.8
Luxembourg	68-73	3.9	7.2	5.2
	73-74	— 2.0	— 4.0	4.5
Netherlands	68-73	9.6	4.6	5.3
	73-74	— 1.3	— 3.2	2.5
Norway	68-73	3.5	2.2	4.5
	73-74	— 2.5	— 15.4	3.5
Spain	68-73	9.9	13.2	7.0
	73-74	4.6	6.0	5.0
Sweden	68-73	3.3	2.3	3.2
	73-74	— 7.0	2.8	3.7
Switzerland	68-73	7.4	6.6	4.6
	73-74	— 10.0	— 13.3	0.2
Turkey	68-73	9.7	20.5	6.2
	73-74	(14.0)	(10.1)	0.7
United Kingdom	68-73	2.2	5.3	2.8
	73-74	— 4.2	— 0.4	— 0.2
IEA TOTAL (2)	68-73	5.3	10.8	4.6
	73-74	— 1.7	— 2.6	— 0.5

(1) Canada has been a net exporter since 1971.

(2) 1968-1973 excludes New Zealand.

Source: 1968-1973, OECD statistics of energy; 1974, preliminary IEA Secretariat estimates. GDP growth rates: Main Economic Indicators, May 1975.

## MINISTERIAL DISCUSSIONS AT OECD

gramme in order to improve the overall energy supply and demand situation, which is of vital importance to the further development of the world economy as a whole.



**Renaat van Elsende,**

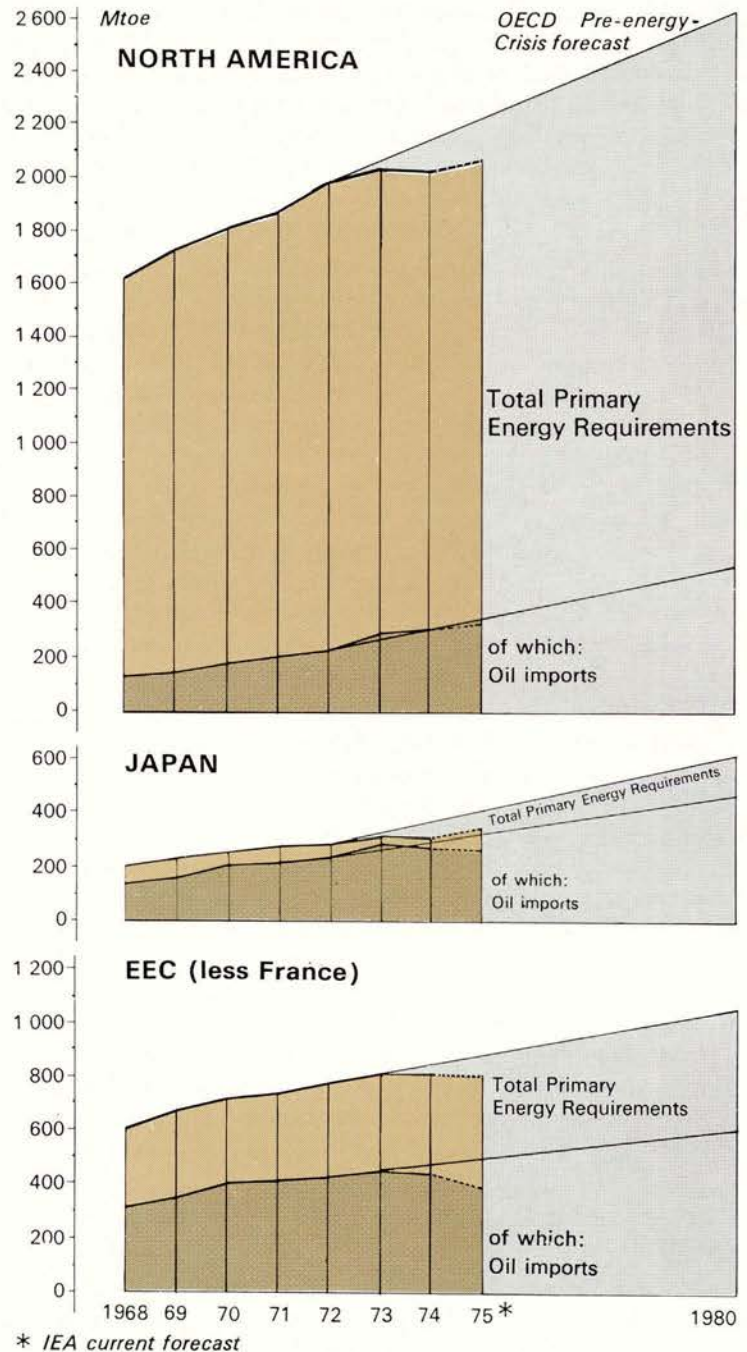
*Belgian Minister of Foreign Affairs, summarised the conclusions of the first meeting of OECD's International Energy Agency at Ministerial Level.*

**T**here was wide recognition of the necessity for co-operation and solidarity between oil consuming countries—not as a response to any other group, but because we view it as the best way to obtain a better worldwide balance of energy supply and demand. Similarly, it was recognised that the Agency's objectives are valid, not only in relation to the present situation in the oil market, but also in relation to the very long-term world energy situation. Therefore our work will be carried forward, in an operational manner, in the following areas:

- The emergency system will be finalised. The Governing Board will take decisions very soon on increasing stock levels to 90 days, and will consider carefully the treatment of products in the emergency system and when and how to conduct a trial run of the system.
- Greater efforts will be made to conserve energy, not only as a result of recession, but in the form of specific measures for that purpose. In that respect specific objectives for 1976 and 1977 will be considered.
- Our policy decisions with regard to accelerated development of alternative energy sources were confirmed and will be implemented in detail.
- We will intensify our co-operative research and development activities, and we will hold a special Governing Board meeting in the autumn to complete our research and development programme.
- We will give greater attention to co-operative development of nuclear energy, including the questions of environmental considerations, availability of fuel and technology.
- The oil market information system will be further developed in order to provide greater transparency.
- There was also general agreement as to the necessity to achieve quickly our objectives of closer relations and an increased degree of co-operation with oil producers. This objective, in order to be achieved, must take into account the fact that developing countries have important problems not directly related to energy, such as raw materials, foodstuffs and problems of the most seriously affected countries. Ministers recognised this fact and expressed their determination to see these problems tackled promptly and with political determination. They stressed the importance of making a beginning in this direction at this meeting of the Council. The IEA itself will make every contribution it can in so far as energy is concerned.

In particular, we are convinced of the need to continue the dialogue with oil producing and other consuming countries, developing and developed alike. We will therefore move quickly and with new ideas to find the best procedures for

## Energy Consumption by Region 1968-1974, 1975 (estimated) and pre-energy-crisis forecasts



doing so; we will make thorough preparations for a reactivation of the preparatory meeting; and we will continue to pursue useful contacts of all kinds, formal and informal. The Governing Board has been instructed to consider these questions as a matter of urgency.

From what I have said, it will be obvious that we intend to continue and reinforce the solidarity which has been established within the Agency, to intensify and broaden our own co-operation, and to co-operate with others. We are convinced this will have positive results for the overall energy supply and demand situation, and thus for the development of the world economy as a whole.

# Recommended Measures to Combat Unemployment

A special Working Party on Employment created in November 1974 by OECD's Manpower and Social Affairs Committee has recommended lines of action open to governments in the present situation in which manpower is being under-utilised on a scale which the Working Party characterises as "unprecedented in the post-war years". The prospect, as seen by the Group, is for continuing high levels of unemployment for some time to come.

A wide range of measures is being used to counter employment difficulties in one or another Member country and the Working Party suggests that these could be extended and adapted in a selective way to the circumstances of other countries.

Since the present employment situation is the result of both conjunctural movements and of changing long-term structural relationships in social and economic life, short-term measures must be such as to facilitate longer-term structural change and to moderate inflationary pressures. They must also be supplemented by coherent policy strategies which act on the relationships among social policies and economic growth and employment.

As to the conjunctural problem itself—large and rising numbers of unemployed—the main means of dealing with it in the view of OECD's Working Party is through monetary and fiscal measures since the success of active manpower policies depends on the general economic environment. But the Working Party also recommends that governments may wish to review the adequacy of measures designed to create work, maintain incomes and spread the burden of unemployment more equitably.

An inventory of practical measures in use in Member countries to deal with the more urgent aspects of the employment situation is being developed by the OECD's Secretariat. (See box). The Working Party itself has summarised and commented on these measures:

### • *Measures to Maintain Employment*

Governments can encourage the practice engaged in by many enterprises of spreading the burden of reduced employment through more equitable work sharing and short time work. Unemployment benefits can be provided during partial as well as complete unemployment, and firms can be encouraged to provide advance notice of redundancies. Redundancies can be stopped temporarily in the public sector and discouraged in the private sector by use of fiscal incentives including the introduction or strengthening of redundancy payments. Additional training or general education can rapidly be provided for the unemployed.

### • *To Maintain and Increase Employment in Firms*

It is often less costly to maintain employment than to create new jobs or to provide adequate income support for the unemployed. The selective support of private employment through direct subsidies, or other fiscal incentives, the promotion of new investment and shifting the incidence of payroll taxes are means of achieving this objective. Constraints on use of such measures include the costs of holding inventories, marketing factors and the need for sectoral adjustments.

A more equitable spreading of the burden of unemployment can, in part, be achieved by work sharing arrangements, shorter hours and part-time work instituted by employers or through union-management agreement. Adjusting unemployment insurance and related measures to help maintain the incomes of the partially unemployed can facilitate work sharing.

### • *And to Create Employment in the Public Sector*

There are three major methods:

*Temporary expansion of employment in the regular public service.* Such a course can improve the provision of services and decrease outstanding backlogs, but it may be necessary, the Working Party cautions, to ensure that the extra funds are used not simply to finance regular employment but to create additional jobs so that the beneficiaries are in fact the unemployed.

*Expansion of public works* can help create employment in both the public and private sectors. The need to develop work quickly suggests an emphasis on labour-intensive projects. Time limits on the availability of funds can be used to stimulate quick response by local and regional governments. Long time lags in the past suggest the importance of ensuring that the effect of such projects on employment does not coincide with the upswing of activity in private construction. Consideration should be given, the Working Party notes, to stimulating public housing construction and repairs in countries where there is a growing gap between needs and construction.

*New initiatives to create community employment.* In several countries jobs have been created at local levels of government, by non-profit institutions and by groups of unemployed people themselves. Such programmes are labour-intensive and can be expanded relatively quickly and can employ young people, among whom unemployment is particularly common, and other less competitive workers in ways that provide new and often imaginative services to meet unsatisfied social needs. →

## EMPLOYMENT

### • *Public Employment Services*

Public employment services may be able to simplify administrative procedures in order to permit more intensive placement and counselling especially about training opportunities.

### • *Training*

Manpower training is an instrument that can be expanded reasonably quickly, particularly if the capacities of the education system and of enterprises are used to absorb a growing number of unemployed. It can be oriented towards improving the employability of individuals and facilitating the changes in economic structure that are anticipated. Training authorities can ensure that people are registered for training as early as possible, preferably before becoming redundant. Training can be supported by making allowances to trainees large enough to encourage people to prefer training to income maintenance; and the entitlement to unemployment benefits can be preserved during training. Training can be linked to employment opportunities, especially newly created ones.

For those who have jobs, training can be extended during short-time working, especially training programmes within enterprises which can receive financial assistance.

### • *Income Maintenance*

Within the context of a given economic situation and institutional constraints, where there is a choice between the maintenance of employment and the resort to income support measures, it is preferable to maintain employment. Measures for employment maintenance and income support should be used in combination. Redundancy payments and improved pensions for those who retire early can help maintain employment as well as providing income support.

### • *The Employment of Migrants*

The decline of economic activity has intensified problems particularly in Europe by sharply reducing emigration. This has helped ease the burden of unemployment in countries of immigration but has increased it in most countries of emigration. Measures to sustain and create employment in the countries of immigration will help ease the burden of unemployment in countries of emigration as will the expansion of permanent employment opportunities by the latter. Allowing for economic and political conditions in countries of immigration, the application of measures for income maintenance, training and job creation programmes to foreign as well as domestic workers will help assure greater equity among countries in carrying the burden of unemployment. Consultations among countries about migration and the reintegration of returning workers are urged to help ensure smooth transitions and could be a significant element in international co-operation.

### • *Policy Co-ordination*

Rising unemployment combined with high rates of inflation and complexities of international interdependency call for increased coherence and co-ordination in both the development and implementation of economic and social policies. Policy co-ordination needs to be improved in order to ensure an effective harmony of policies at a time when rising unemployment has both structural and conjunctural components which are amenable to both general and selective policy instruments. Manpower authorities have a significant role to play in ensuring an effective harmonisation of policies.

## Some Measures Being Used to Limit Unemployment and A

*This list is based on the first submission of countries to OECD's Inventory in February 1975. It will be updated on a continuing basis. A number of countries including Austria, Finland, Norway and Sweden reported few unemployment problems as yet and their measures must be seen in this context.*

### AUSTRALIA

A system of long service leave is generally available to most members of the work force. In the past it has been used when there were redundancies in the coal industry because of structural change and could be used again for this purpose if found appropriate. In July 1973 income maintenance, equal to average straight time earnings over the preceding six months, was provided to people laid off by firms undergoing structural change due to the reduction of tariffs. It has since been extended to other types of structural changes. If the unemployed person takes a job at a lower salary than he had before, the difference is made up by the government and the firms get compensation and loan guarantees to help them reorient their production.

### AUSTRIA

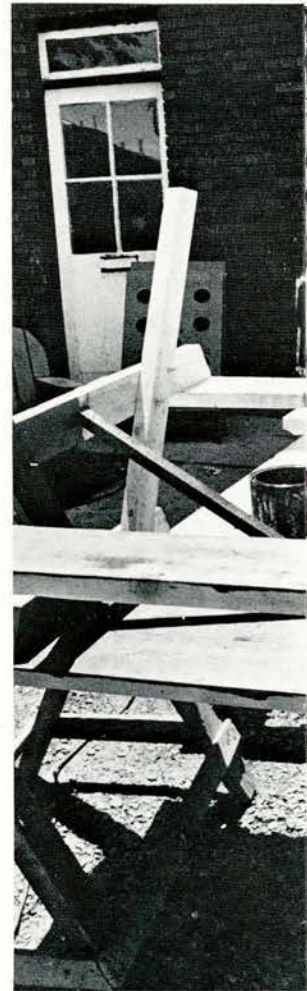
Austria has extended its redundancy payments scheme to new groups of workers and instituted wage subsidies for firms willing to keep their employees rather than laying them off.

### BELGIUM

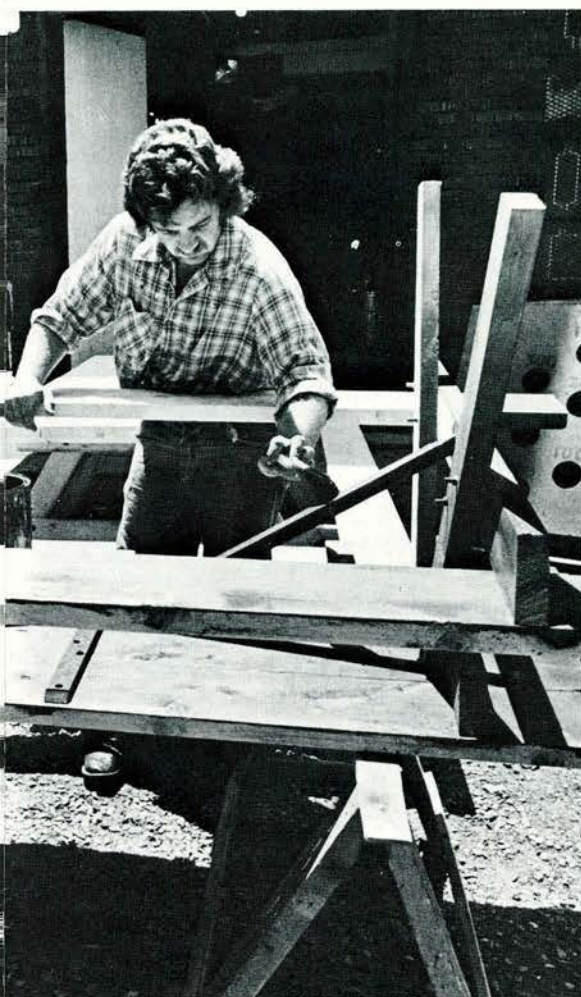
A national collective agreement concluded in December 1974 and covering virtually the entire work force provides early retirement with pension for unemployed workers aged 60 and above. The amount of the payment, which supplements the unemployment insurance benefit, is about half the difference between that benefit and previous salary.

### CANADA

Under a Local Initiative Programme federal funds are granted to community



# by OECD Countries Mitigate its Harmful Effects



*Canada: A Local Initiatives Programme of the Department of Manpower & Immigration provides funds for creating social amenities. Left: Claudius Enterprises helps disadvantaged people in a section of Ottawa. Below; Another group translates books into braille on a computer.*



*Above: Norway—A special placement office for women applying for part-time work. To left: Italy—A secondary school devoted to adults.*



groups which are willing to provide social amenities—creating parks, looking after adolescents during school holidays, visiting the sick, etc. Some 200,000 jobs have been created since 1971 and administrative costs have been kept very low at only 4 per cent of total expenditures. This Local Initiative Programme has been extended to the long term unemployed and the disadvantaged, for whom 1,800 jobs have been created on 134 projects mainly in the manufacturing sector. It is also being applied to young people: those who can make valid proposals for summer jobs (projects which provide innovative services) are eligible for subsidies. For example, 13 young people in Hudson, Quebec were granted \$16,000 to develop an orchard and five acres of farmland, learning to live under difficult conditions and to work the land. The produce was sent to a food depot in a poor section of Montreal.

The Treasury Board provides special funds under Federal Labour Intensive Programmes which are used to help other departments and agencies undertake labour-intensive projects in areas of high unemployment.

## FINLAND

Subsidies are granted to firms which suffer as a result of having engaged, on a permanent basis, inexperienced labour within a development region. The amount ranges from 6,000 FM (\$1,690) to 15,000 FM (\$4,225) per employee.

## FRANCE

A January 1975 law provides for a supplementary "waiting" allowance for workers who are discharged as a result of economic circumstances. This allowance brings total unemployment benefits to 90 per cent of a worker's previous earnings up to a maximum of F11,000 (\$2,709) a month.

An economic and social development fund helps small and medium size enterprises to restructure their production in a way that will not create unemployment.

At the beginning of June a scheme was instituted to provide jobs and training for young people who comprise a large portion of the unemployed.

## GERMANY

As a temporary measure the German Federal Labour Institute was authorised to pay firms for taking on employees from the ranks of the unemployed in areas

## EMPLOYMENT

having more than average unemployment. The allowance amounted to 60 per cent of wage costs for a period of up to six months. To improve employment opportunities for the hard-to-place, the Labour Institute can pay a settling-in allowance of up to 80 per cent of a worker's salary for up to two years. The payment can also be made as a lump sum.

### IRELAND

Industrial development grants and loans are being stepped up and training grants have trebled, with the help of matching grants from the EEC Social Fund, and the number of trainees is expected to reach 6,500 this year.

### ITALY

Italy has strengthened income maintenance allowances for unemployed workers in the construction industry and is reinforcing research on training opportunities.

### JAPAN

At end-1974 in an effort to protect employment, the Japanese Government made additional finance available for small and medium sized firms.

Japan has also instituted a procedure whereby firms which lay off rather than discharge workers and give them lay-off pay have a right to government subsidies (50 per cent of the amounts paid out for large firms and 66 per cent for small firms).

### NETHERLANDS

A 1974 amendment to the Contracts of Employment Law provides for an investigation in the event of a proposed lay-off to see whether employment could be maintained through shorter working hours or temporary financial assistance.

9.5 million Guilders (\$3.96 million) have been appropriated to support employment especially in the building industry by providing more Government construction work and loans to the private sector. Investment allowances for construction have been altered and the rate of depreciation increased. Aid is provided by the Government to support training for workers who are employed but threatened with losing their jobs through structural changes in a company. In the case of unemployed workers, an experimental formula has been agreed to by the social partners and the Government which will pay the cost of training in individual

companies and provide a bonus to employees of 30 Guilders (\$12.50) a week over and above unemployment benefits.

### NEW ZEALAND

Placement of the unemployed in what is called "worthwhile work" in government departments began in April 1973 but few unemployed required such posts in 1974; the possibility of such placements exists however.

### SPAIN

Spain has earmarked a substantial sum for employment maintenance, mainly for public works but also for housing and school construction. Early retirement pensions amounting to 2.4 billion pesetas (\$43 million) will be provided for workers in sectors suffering economic difficulties.

### SWEDEN

A Security of Employment Act imposes a minimum period of notice for workers who are laid off. The older a worker, the longer the required notice regardless of his years of service. There is a right of appeal in the case of dismissals.

The employment security of the most vulnerable employees, those who are growing older or whose capacities are decreasing, is enhanced by a 1974 law providing a statutory basis for "adjustment teams". The function of these teams, which are tripartite, is to help firms find ways to keep these workers in jobs and to hire disadvantaged workers from the outside. The firm is compensated for forty per cent of the wage costs of handicapped persons engaged on the advice of the labour market authorities and at the same time becomes entitled to another forty per cent for an employed worker who has become handicapped.

Existing measures providing for training, income maintenance and investment in selected areas as well as wage subsidies are in a state of readiness to deal with any expansion of unemployment.

### TURKEY

Turkey is speeding up the preparation of legislation designed to create training opportunities for apprentices both on the job and in special training institutions.

### UNITED KINGDOM

An Employment Protection Bill now before the Parliament provides partial compensation for a shortfall in hours.

Contingency plans are also being prepared for additional training courses with special attention devoted to school leavers. "Community industry" is being used to provide employment for young people who find it difficult to get and keep a job (construction of playgrounds, gardening for old people, helping in social surveys, preparing exhibits for local museums, etc.).

The regional employment premium has been doubled making it more attractive to employ labour in manufacturing in the development areas.

Proposals are being discussed to set up a National Enterprise Board, one of whose functions will be to conclude planning agreements with the more important firms covering such aspects as employment and measures to preserve it.

### UNITED STATES

An Emergency Jobs and Unemployment Assistance Act was passed in 1974 designed to provide employment opportunities in the public service—local, community, state or federal—in areas of high unemployment. A sum of \$2½ billion has been appropriated for 1975, and it is hoped that an additional 330,000 people will be employed in this way by June 1975. Priority will be given to individuals who have exhausted their unemployment benefits or are ineligible for them.



A number of countries have taken measures to prevent lay-offs by *sharing the work*. Employer and trade union Federations in *Denmark* have agreed on guidelines under which firms can reduce working hours by increasing the length of breaks, working alternative weeks and eliminating overtime rather than discharging anyone. *Belgium, France, Germany, Italy, Luxembourg and the Netherlands* have encouraged firms to reduce working hours rather than laying workers off, and unemployment benefits have been extended to cover people who are working shorter hours. The employer pays wages only for the hours worked, thus reducing his total wage bill, and unemployment benefits are paid to the workers for at least part of their shortfall. Partial compensation for a shortfall in hours is now before Parliament in the *United Kingdom*.

In a more general way a number of countries are moving to provide themselves with the institutional and legislative infrastructure for a more active manpower policy to cope with periods of economic difficulty such as the present one.



# Education and Work in Modern Society

The acceleration of change and its unpredictable nature, the questioning and often rejection of the values and structures of the past, the blurring of the old demarcation lines between education and work, and the desire for personal fulfilment all combine to suggest that a new look is needed at the ways in which people are equipped to play a useful role in society and to manage their own lives.

This was the context for the work of the OECD Secretary-General's ad hoc Group of Experts on Education and Employment, chaired by Professor Clark Kerr (United States), whose members were Jacques Delors (France), Ricardo Diez-Hochleitner (Spain), John Hargreaves (United Kingdom), Torsten Husén (Sweden) and Sylvia Ostry (Canada). The report stresses the need for co-ordinated solutions: "The detailed policy suggestions that we make are not particularly novel, but, *as a total package, they go well beyond the current performance of any single Member country.* We do suggest some new overall perspectives towards the solution of the problems that confront Member countries."

The report's main lessons and recommendations, for which its authors alone are responsible, are summed up below.



## A Positive Policy for Working Life

Governments should take affirmative action to secure improvements in the quality of working life, with major emphasis on the goal of personal fulfilment over and above the technical and economic requirements of production. Such a positive policy for working life should include the development of more clearly defined criteria for job assessment, merit reward and salary

scales; job enrichment; increasing flexibility of work and careers and in the organisation of the working day and week; greater worker participation in decision-making; and the provision of opportunities for career development and training on a more equitable basis. The public sector, in its recruitment and promotion policies, should take the initiative in this area. Such developments depend on considerable changes in attitude on the part of both employers and unions, and more positive action by governments is needed to facilitate this.

### *Policies for the Disadvantaged*

Policies to help disadvantaged people (women, young people, ethnic and racial minorities, the physically and mentally handicapped, and immigrant workers) should endeavour to: (a) give them special assistance in gaining skills and in finding employment, (b) offer them more opportunities for development on the job, and (c) provide better co-ordination between policies for employment security and for income maintenance.

### *Equality for Women*

*Co-ordinated measures* are required in education, the labour market and the community at large. These will include:

- establishing equal access to educational programmes for both sexes
- increasing adult training and retraining opportunities for women, particularly those who wish to re-enter employment after bringing up their children for a few years
- opening nursery schools and providing child-care services
- providing more opportunities for part-time work
- more flexible time schedules and career patterns.

### *Immigrant Workers*

The relative lack of information about immigrants and their needs—which is dismaying for a problem of this importance—does not make it easier to find a solution. It is urgent, however:

- to adapt employment policy in order to give immigrants easier access to better jobs;
- to give immigrant workers and their children a better education which will help them both during their stay and after they return to their home country;
- to provide immigrants with more information about their rights.

As an indication of their real concern and practical intent, governments should draw up a "Bill of Rights" for immigrant workers similar to the legislation already enacted in some countries to protect women. Such a "Bill of Rights" must not be a substitute for action but a public and overt focus for policy reform and practical results.

→

Observations	Recommendations
the quality of working life is not keeping pace with the capacities and aspirations of individuals	<i>a "positive policy for working life" that involves better jobs, more flexible arrangements on and around the job, more chance for participation, more equity in advancement</i>
certain groups on the labour market are disadvantaged (young people, women, minority groups)	<i>measures to create greater opportunities for young people, more equality of treatment for women and better chances for minorities (a "Bill of Rights for migrant workers")</i>
unwise separations exist between the world of education and the world of work	<i>an "integrated policy for education", particularly through recurrent education, so that more students may work and more workers may obtain additional education</i>
too many rigidities are imposed on the lives of individuals	<i>more options should be given to more individuals in a "free-choice society" so that education, work, leisure and retirement patterns can more closely conform to individual wishes</i>
educational opportunities are unequal	<i>more equitable arrangements, including comprehensive schools and the consideration of "educational drawing rights"</i>
there is little communication between the educational and labour market authorities	<i>mechanisms for joint consultation</i>

are discriminated against by employers. They may also have difficulties in resuming formal education and training.

A basic change of attitude is needed on the part of both employers and the educational authorities. The latter should be encouraged to realise that it is sometimes the more able who follow non-routine patterns through education and into employment.



## An Integrated Policy for Education

Priority should be given to three areas of action:

- continuing education for adults in order to provide for personal development over a longer part of the lifespan;
- new opportunities for young people to combat the inadequacies and uncertainties confronting them today;
- strengthened basic education, so as to prepare children for a changing and unforeseeable future, and to equip them for continuing learning.

### Continuing Education

A more coherent philosophy for adult education is now urgently needed. This education should not be a second-class supplement to the formal educational system but a closely co-ordinated part of a broader educational system whose programmes and certification procedures are designed to provide education over the individual's whole lifetime, in alternation with other activities. Such an approach can be effectively implemented only in conjunction with supporting policies in the work situation. In particular, it requires effective provision for educational leave of absence and some degree of industrial representation. Pedagogical changes, the assurance of being able to go back to the same job, protection of seniority rights and the introduction of new patterns of finance are necessarily important factors for this approach to education.

For a policy of continuing education to have the greatest chance of success, it should be backed by a fund to which both governments and enterprises contribute. This can be achieved either through legislation or collective bargaining.

It is precisely because of its method of financing that the 1971 French Law on continuing education is especially interesting. It allows up to 2 per cent of a firm's labour force to be away on educational leave of absence, which is financed by a minimum proportion of the wage bill (at present 1 per cent, rising to 2 per cent by 1976). This law is still in its infancy, results are only just beginning to emerge and it is as yet difficult to estimate how much of the increase in training opportunities is due to the law's initiative.

In Belgium, a similar law was passed in 1973 which gives all full-time workers under 40 who are studying in the evenings the right to be absent from work on full pay for a certain number of hours.

In Germany, the Labour Promotion Act of 1969 constitutes another step towards establishing the right of employees to take up education, with extensive compensation for expenses and loss of pay. An analysis of beneficiaries under this Act in 1970 reveals that younger employees (those under 35) are the

### Young People

Being the "last in" and the "first out", some young people come up against many problems in their careers which are due to the fact that they lack both formal credentials and the specific training required for skilled jobs. Their problems are compounded by the attitudes of many employers who hire according to such criteria as stable work history and settled family life.

An additional group of young people is composed of those who show independence of spirit in searching for varied and meaningful human experiences, and, as a consequence, they

What choice do young people now have when they leave compulsory education? What solutions can be recommended to solve the problems that arise in some typical cases?

	<b>A young person...</b>	<b>Recommendation</b>
<b>A</b>	joins the labour force but finds no job	Lower social security payments for young employees. For example, exemption from pension fund payments might be an incentive to employ young people. This would balance the advantages enjoyed by other young people who are in full-time education.
<b>B</b>	... goes straight into work and abandons study altogether	Increased financial aid for young people from low-income families who continue school after the compulsory age.
<b>C</b>	... combines employment with part-time education	Strengthen the rights of young workers to educational leave, both for vocational and general education purposes. Introduce a modern system of apprenticeship and review the traditional schemes.
<b>D</b>	... combines employment with full-time education	Encourage this possibility. European governments in particular should create more part-time and temporary job opportunities in the public sector, both for adolescents and adults engaged in full-time education.
<b>E</b>	... stays at school full-time	Less secondary school streaming and more liberal entry to higher education. At the same time, entrants to higher education should be given the opportunity to defer their entrance until they have gained some work or social service experience if they wish; entrance requirements should be adjusted to give preference to those with prior work experience.

most heavily involved and that people with the least amount of formal education are under-represented.

Another significant development is the 1974 agreement reached in *Italy* between employers and the Confederated Metalworkers' Union, giving workers the right to 150 paid hours of educational leave over a period of three years.

In *Sweden*, a recent law recognises the general right to educational leave of absence.

The future of continuing education for adults is linked with a change in educational and working opportunities for young people in the 16-20 age-group. If at that age—or indeed

before—they are frustrated by their school experience, they are unlikely to take advantage of their educational opportunities later in life. Many of the problems of young people are a consequence of the irrevocable decisions about education and work that they are often compelled to make before testing themselves in the practical world. Arrangements under which adults have greater opportunities to develop, in which the educational value of experience on the job is better recognised, and in which work provides more avenues for career development, would also help to relieve the pressures on young people to hang on indefinitely in education or to drop out permanently because neither education nor work is appealing. It would also be fairer to the older generation, which missed its own opportunities but now pays for them on behalf of others, and fairer to some social groups, women for example, who have been channelled by social prejudice and educational discrimination into occupations below their potentialities.

### *New Opportunities for Young People*

In order to cope with the rising numbers of students in the '60s and at the beginning of the '70s, many OECD Member countries adopted a policy of diversification in higher education. The new institutions should now be made really acceptable. Here, as elsewhere, the authorities should set the example by offering the students who have been educated in such schools equal terms with university graduates for recruitment into the public service.

But for some time the number of students in many OECD countries has tended to fall or at least to level off. It was assumed only a short while ago that the forces of change would lead gradually to a system of full-time education for all young people up to their late teens. But it now appears less clear that this tendency is inevitable or even desirable. It has been observed in the United States, where the process described above has gone furthest, that many young people now want to start their working life at sixteen or so, even when they are in full-time education. If this tendency develops and spreads, the problem will be how to provide a range of education-work options for the teenage group.

The possibilities are vast, although putting them into practice will be difficult because it means a marked change of outlook.

The report makes several recommendations to this end:

- The educational authorities should give incentives to industrial, commercial and administrative enterprises, public and private, to formulate practical projects with pedagogical value on which young people in upper-secondary academic courses can work. The existence of such projects would of course have repercussions on the organisation and content of school courses.
- Educational institutions can help young people to acquire competence rather than narrowly defined skills by adopting as flexible an attitude as possible towards transfers between school, work and social service. Whenever possible, courses should be organised on a modular structure.
- Governments should give more incentives to employers to offer a wider range of opportunities for young people and to allow them to combine work and education. The minimum wage legislation might be reviewed. Social security contributions might be remitted during the first few months in a new job, provided the young people also participate in formal training. Income maintenance might be provided (in the absence of unemployment insurance) for those wishing to change their first job. In the public sector, social programmes could be

## EMPLOYMENT

developed which would provide interesting jobs to meet unsatisfied community needs.

### *Implications for Basic Education*

Many of the problems discussed above clearly have their origin in basic compulsory education or even earlier.

A system of recurrent education postulates that more equality and more efficiency will result from a wider range of education and work options for young people, interacting with more rights and opportunities for adults in the labour force. But if young people are to be given more options, all children should be brought to the starting line on more equal terms, with more of an equal opportunity to exercise their talents. Otherwise, the existing process of social selection via social origin will go on.

This implies two challenges for the basic educational system. First, there would be an overriding necessity to ensure that during their basic compulsory education all children are helped to develop a propensity for further education in their subsequent careers. Second, initial disadvantages due to inadequate home and community conditions should as far as possible be eradicated by positive discrimination in the use of resources in favour of disadvantaged groups. Equality in education means giving the less fortunate children different and more, and not the same and equal, educational provisions.



### More Options for the Individual within a Free-choice Society

All OECD Member countries rely to a very great extent on educational and occupational choices by individuals and their families for the development of human potential, adaptation of skills to the needs of the economy and equilibrium between economic, cultural and personal priorities. Throughout his lifetime, the individual is called upon to make an increasing number of crucial decisions of an educational or occupational nature, and together these decisions have a great deal of influence over whether the social system develops creatively.

### *Overall Balance between Education and the Labour Market*

Whether there exists today an overall imbalance between the growth of education and the capacity of the OECD economies to absorb the skilled people emerging from the schools and universities is an initial question to be asked. Such a situation of imbalance would, of course, render rational decisions by individuals about education and employment exceedingly difficult, and would lead to frustration and disappointment on the part of a growing number of young people and their families and thereby to social and political discontent.

In the '50s and up to the end of the '60s, the labour market was very favourable for people with higher education. In spite of large increases in enrolment, the relative earnings of graduates held steady or improved, and unemployment was virtually nil. However, in the late '60s, the situation changed, particularly in Sweden, the United Kingdom and the United States, and to some extent in Canada. Graduates experienced a certain amount of unemployment and the initial search for a job lengthened. The previous privileged position of scientists

and engineers (who had total job security) disappeared. There was a decline in the relative earnings of new graduates. In other countries for which evidence exists, i.e. Germany, Italy, the Netherlands, Norway, Spain and Yugoslavia, the situation appears to have been different, and there were fewer worries about the employment of graduates. In Japan, there was a substantial reduction in the earnings differentials between graduates and others, but no noticeable problem of unemployment. It is therefore impossible to generalise about the situation in the OECD countries as a whole, but recent imbalances between the number of graduates and job opportunities have to be watched carefully, since it is not entirely a cyclical but also a structural phenomenon on the labour market. A particular problem has developed in the teaching profession, which has been sharply affected in countries where there has been a declining rate of growth for education—such as has happened in higher education in the United States.

There have thus been some important disequilibria in certain countries, and the situation needs to be kept under surveillance especially since the difficulties would be sharply accentuated if there were a prolonged period of slow economic growth.



*"During their basic compulsory education all children should be helped to develop a propensity for further education in their subsequent careers" (above)*

*"Adult education should not be a second-class supplement to formal education but a closely co-ordinated part of a broader educational system" (right)*

*"Policies to help the disadvantaged should endeavour to give them special assistance in gaining skills and in finding employment" (far right)*



### *Education and Competition for Jobs*

Although there is no reason to believe that "credentialism" has resulted in any major misallocation of resources, the present emphasis on paper qualifications is somewhat exaggerated, both on the labour market and in education. The public sector

### Participation in adult education by type in selected OECD countries around 1970\*

Country	Total Participants (thousands)	Participants in vocational education (thousands)	Participants in general education (thousands)	Total Participants as percent of adult population	Participants in vocational education as percent of the labour force
Canada (1970/71)	3,084	1,152	1,932	23	14
France (1971)	—	1,600	—	—	8
Germany (1970 or 1971)	8,953	1,917	7,036	20	7
Sweden (around 1970)	2,036	239	1,797	34	6
United Kingdom (1970)	6,041	2,951	3,090	15	12
United States (1969)	13,150	4,839	8,311	10	6

\* This table is taken from a parallel study: *Learning Opportunities for Adults, Framework for a Comprehensive Policy for Adult Education*.



should take a lead in reforming its recruitment and promotion practices by reducing the emphasis on certificates and diplomas. Cumulative records of individual performances would in many instances be fairer and more effective indicators of the potential of individuals. The use of credentials and licensing arrangements as protective devices in certain professions should also come under closer scrutiny by governments.

### *The Need for More Flexible Life Patterns*

If people are to have as much freedom as possible to organise their lives and career patterns, undesirable conformity should not be enforced by the regulations of public agencies or private enterprises. The financial and institutional relationships of employment, of recurrent education and of retirement should be reviewed by governmental and private institutions in order to remove unnecessary impediments to individual choices. The economic implications cannot be ignored: social development must be consistent with an economically viable balance in our societies between leisure, work and education. Governments, unions and employers should work together in order to agree on how the costs and benefits should be allocated and to decide what underlying institutional arrangements will be needed to make greater flexibility possible.

These new life patterns will not emerge of themselves. It is the responsibility of public policy, in conjunction with the social partners, to define the instruments that will provide the possibilities of and the incentives for individual and institutional change. The most powerful instruments are, on the one hand, a redefinition of the rights of the individual and, on the other, provision of the financial means to make these rights a reality.

In order to make this freedom in education effective, a study should be made of educational "drawing rights", whereby all young people at the age of, say, 16 would have a certain educational capital on which they could draw according to the career pattern they adopt. Such an arrangement might lead to more rational choices in the 16-20 age-group, allowing those who prefer to work to do so without cutting themselves off from the right to higher education at a later stage.

Naturally, no adequate answers can be found unless the world of education and the world of work are brought closer together. This means that the social partners must have a voice in policies and must be ready to take on new social responsibilities. Some advisory machinery at national level is clearly needed to deal with the range of issues covered in this report. Great store might also be laid on regional or local institutions within which educators, trade unionists and employers could promote the development of their communities by relating educational and work opportunities.

# Aid for Social Development

*Social development in the poorest countries can be defined as improving the distribution of growing resources. Although the developing countries themselves bear the main burden for this type of progress—which is by its very nature intangible—donor countries have shown a growing interest in contributing to it. The activities of the countries which belong to OECD's Development Assistance Committee in this field are described below.*

All members of the DAC consider that minimising social problems is a direct aim of their aid programmes, but their approach to the problem is not always the same.

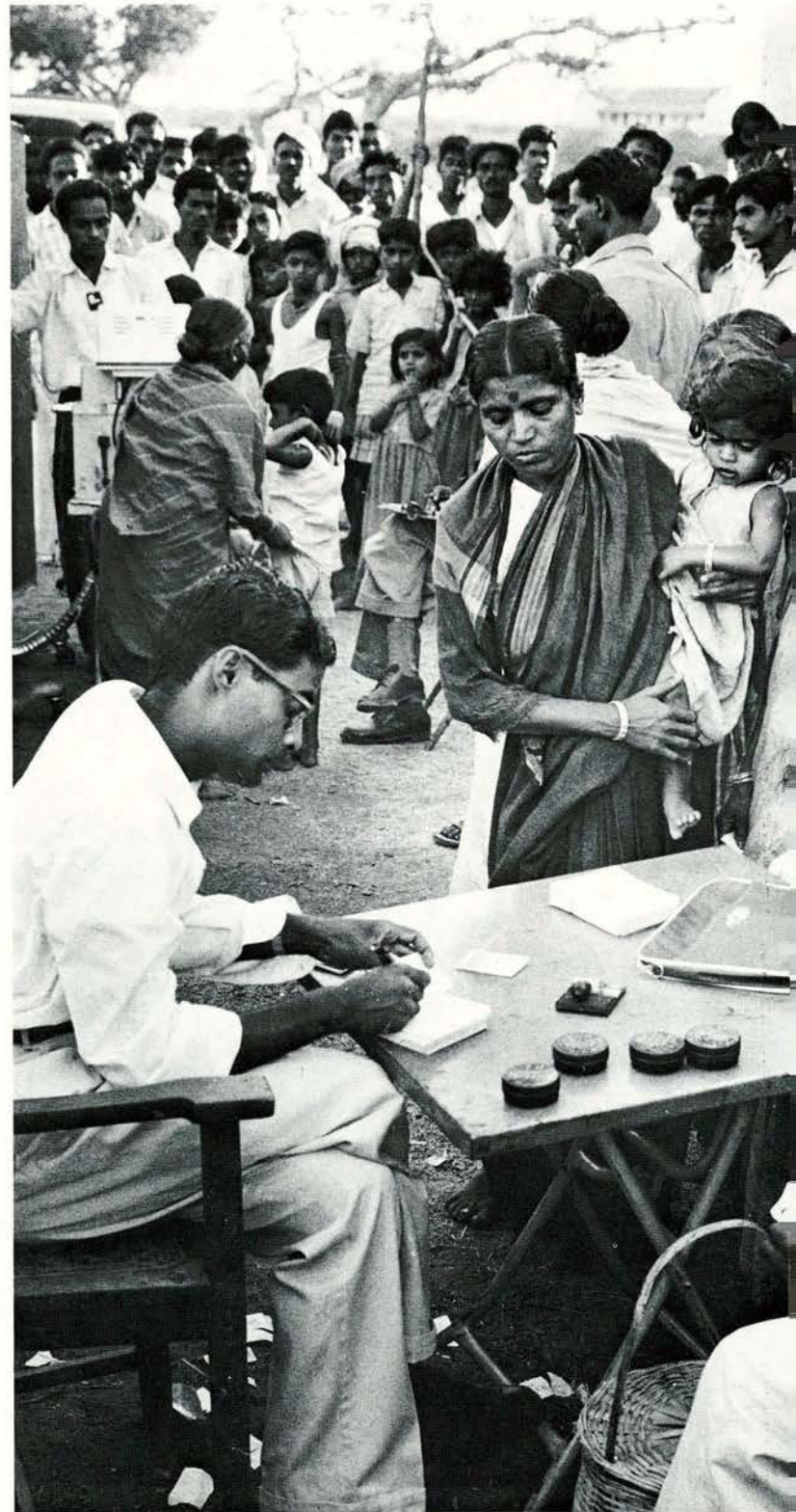
## Social Objectives in Aid Policies

Certain donor countries specifically mention structural changes favouring greater equity as being among their objectives. For example, the Netherlands government has declared that “the most important principles underlying Netherlands development policy are furtherance of the self-reliance of developing countries and support for development processes aimed not only at growth but also at structural changes and greater equality in the distribution of power and prosperity”. For Sweden, the overall objective of the aid programme is to “assist the efforts of the developing countries aiming at economic and social development and justice”, while Australia places “increased emphasis on aid which has greater social welfare, employment and distributional benefits”.

Most countries use less ambitious sounding language and express their aims in less concrete terms—raising the living standards of the “mass of the population”, “the poorest majority”, or the most “deprived” groups.

Among the multilateral agencies, some, such as the World Health Organisation (WHO), were set up with specific social aims. Others, such as UNESCO, UNDP and FAO, while having wider objectives, have also been concentrating increasingly on the social aspects of their activities.

The greatest change has taken place in the activities of the financial institutions and particularly the World Bank which has at-



*Preventive medicine and basic health services are becoming more important in aid programmes.*

tached the greatest importance to eliminating the profound differences between the inhabitants of the developing countries and to working out a strategy of development which is to the advantage of the poorest groups (the Bank has shown that social projects can give more than adequate financial returns). Regional banks are now following the lead.

Non-governmental agencies have changed their orientation less, since they were already active in the social field when aid donors were concerned mainly with economic growth. This does not mean that their programmes have not evolved in response to the evolving situation in the developing countries and to their own experience.

## Extent of Aid for Social Development

It is impossible to give an indication in monetary terms of the amount of aid which can be considered "social", since social development is a matter of the intention with which a project is conceived and therefore cannot be categorised as easily as aid to agriculture or industry.

Statistical reporting by DAC countries, however, gives certain indications of magnitude. Thus two categories are clearly relevant—health (including demographic activities) and social infrastructure and welfare. For the first, total commitments by DAC Members in 1973 were of the order of \$400 million for health (about half of which was for family planning), and for the second \$300 million. These figures correspond to roughly 4 per cent and 3 per cent respectively of total DAC bilateral commitments, compared with 5 to 7.5 per cent, depending on the definition used for aid to agriculture.

Two problems arise in assessing the accuracy of these estimates. These two categories do not account for the whole of aid for social development and the second necessarily includes rather disparate elements: housing and administrative building as well as "social welfare" activities.

## Specific Projects Providing Aid for Social Development (1)

### • *Employment*

A number of countries have explicitly included the employment objective as one of the elements of overall aid programming, although few have gone as far as Sweden which makes employment policies of the recipient countries one of the criteria for deciding on the geographic distribution of aid. Some donors, including the EEC, have been prepared to favour labour-intensive methods even if this means an increase in the cost of the project. This type of experiment has included projects on fish processing (Norway), roads and other public works (United States and Sweden), educational building (Denmark), house-building (Canada and the United States).

Whereas the United States was able to report that recipients were in general responsive to the introduction of labour-intensive techniques, Norway found a marked preference by recipients for highly mechanised devices.

### • *Rural Development*

The growth of agricultural production is essential to an efficient

rural aid programme, but most members of the DAC have programmes which go well beyond.

Their approach to the problem is a comprehensive one in which the key element is the *large-scale, integrated project*. A good example of an aid-financed project of this kind is the Swedish-financed Chilalu project in Ethiopia, which has reached many of its objectives but has also encountered a number of difficulties, including: dismissal of farm tenants as a result of mechanisation, a decline in agricultural prices due to increased supply, difficulty of reaching small farmers in an economic structure favouring large-scale farming, imbalance between social and productive activities, distortions in favour of the region chosen for the project. Some of these problems can be corrected, while others are probably inevitable in such an approach and not sufficiently serious to cast doubts on its value. The integrated approach has also been emphasised by France, the Netherlands, Norway, Switzerland, the United States and the EEC.

The World Bank has substantially increased its rural development activities. Seven projects, totalling \$239 million, or about 5.5 per cent of current lending, were approved in 1973-74.

### • *Health*

Health services are traditionally important in social aid programmes, but less stress is given now to curative medical treatment, donors recognising that isolated hospital projects (in particular prestige hospitals in capital cities) have little impact on the health problems of the mass of the population who suffer from the lack of basic health services. There has been a certain shift of interest to preventive medicine, in research as well as in programming.

The training of local personnel, in particular of paramedical personnel (perhaps inspired by the Chinese "bare-foot doctor" system) is gaining in importance as compared with the supply of long-term seconded specialists. The European Community for example is turning to the financing of primary health facilities. Investment projects of Associated Countries submitted for Community approval must be presented as part of national programmes which take into account the foreseeable trend of population requirements and must include reasonable estimates of the personnel—and the funds—that will be necessary. The Community found that the previously financed health projects suffer from paucity of financial appropriations for operation and maintenance and inadequacy of local facilities.

In the fight against epidemics, DAC Members co-operate in various ways with the WHO, but the main weapons are created by basic medical research. In this context the United States is now funding research on developing a vaccine against malaria, and in the United Kingdom research work on tropical diseases is of long standing. Sweden supports an Institute of Development Studies at Sussex University in the United Kingdom, which does research on medical administration in the Third World.

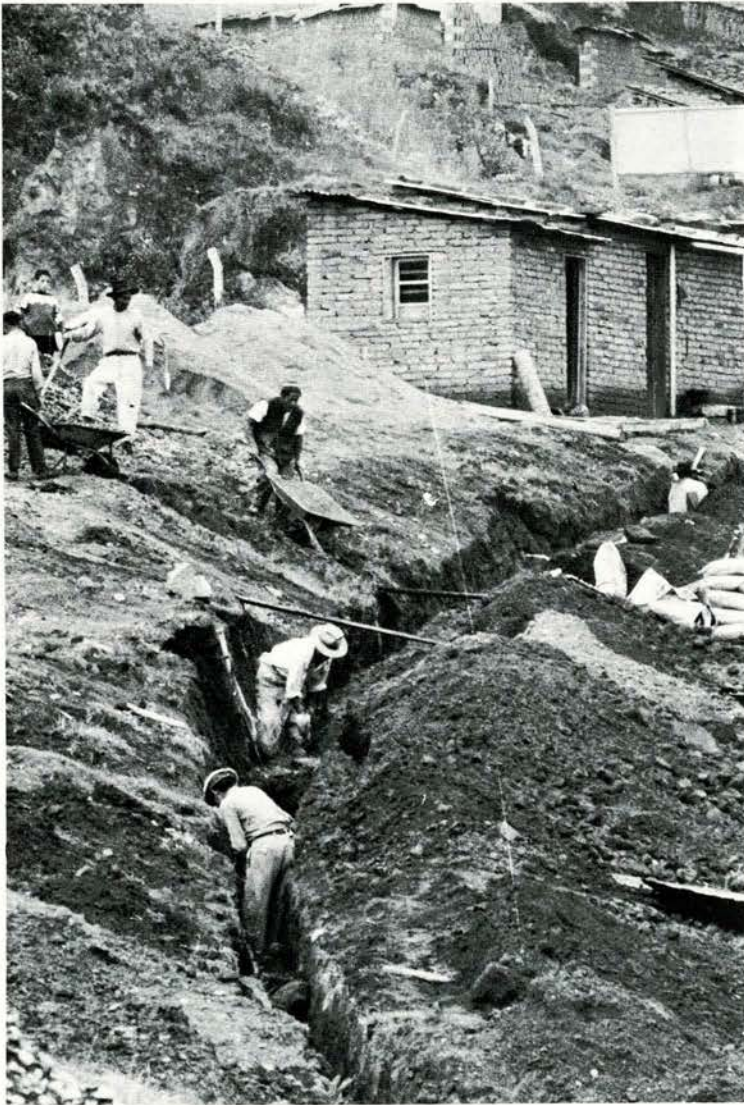
### • *Nutrition*

Nutrition problems vary in different regions of the world but certain approaches to basic problems are applicable everywhere. Thus, Sweden was able to apply to nutrition ventures in Tunisia and in Tanzania the experience gained in the Ethiopian Nutrition Institute which is to provide research and training in nutrition useful both to Ethiopia and neighbouring countries. Its Food

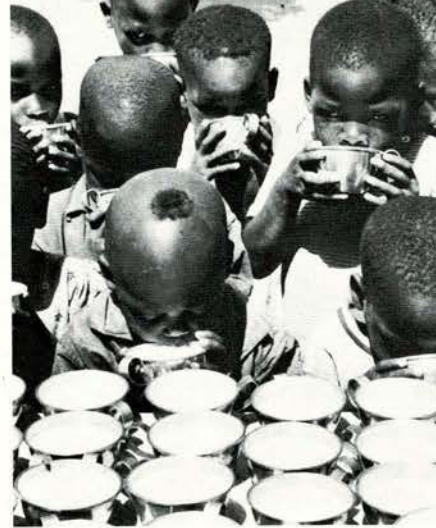
(1) *Projects and programmes cited are only examples and by no means a complete list of aid activities for social development.*

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*Providing plumbing for a newly built house in Ecuador.*



*Left: Children learn about nutrition and health as they enjoy their morning milk at a school in Chad.*



*Below: Improvements in conditions for women and their integration into the process of development is now part of many aid programmes.*

*Right: Prototype of apartment house in a new system of industrialised construction for developing countries. Building Research Establishment, United Kingdom.*



Production Unit for protein-rich weaning foods ("Faffa Programme") has proved of great value during the recent severe famine.

In the United States nutrition research is also being done. They have succeeded in adapting high-lysine maize and found that wheat flour can be satisfactorily fortified with lysine or soya flour to provide most of the daily protein requirements; programmes are already under way in North Africa and elsewhere, where wheat eaters suffer from protein deficiency. Another US project is to relieve vitamin A deficiency, the biggest cause of preventable blindness in the developing countries. Australia has financed the production of protein-enriched bread in six Indian cities and will construct three more bakeries. The bread is to be distributed by the State Social Welfare Department to under-privileged children.

### • *Drinking Water*

Due consideration has been given in most Members' development aid programmes to water supply for agriculture and rural development, for irrigation and stock breeding, but so far comparatively little attention has been given to safe water supply for human consumption.

There are a few exceptions to this rule: the European Commission decided in 1972 to finance a water supply scheme for the town

of Moroni in the Comoro Islands and additional municipal work at Paramaribo in Surinam. Japan restored the water supply facilities of Vientiane, and the United States has made a \$10 million loan to rehabilitate urban water systems in Indonesia. Similar activities are included in US loans to Colombia for urban redevelopment. Australia is improving the water supply in the Gilbert and Ellice Islands, while Canada has a number of projects, especially in the Commonwealth Caribbean. France, Belgium and Sweden report increased attention to water supply for consumption in rural areas.

### • *Demographic Activities*

Ten years ago developing countries were non-committal about demographic policies but since then the very rapid growth of population has instilled growing interest in these problems by the governments concerned. In 1973, 32 such countries had government birth control programmes and many others were the beneficiaries of other demographic programmes set up by non-governmental organisations.

Overall aid (2) to demographic activities in that year amounted to \$227 million of which roughly half (\$108 million) was for birth

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(2) *On the part of bilateral donors, international organisations, foundations and private bodies.*



lot of women and integrating them into the process of rural development.

### • *Housing and Urban Planning*

The demand for inexpensive housing is great throughout the developing world, and the solution of this problem is closely linked to other aspects of social development. Foreign aid in this field has financial, technical and research aspects. High building costs and high interest rates easily put even the most modest housing beyond the reach of the lower-income groups.

To lower building costs the United Kingdom provides aid for house mortgage financing (in 1973 commitments were made in Barbados and Thailand). The Commonwealth Development Corporation (CDC) has increasingly turned its attention to housing estate projects.

Research is necessary to perfect techniques of low cost housing construction which are specially adapted to the climate, materials and social needs of the countries. They should be labour-intensive, and should make use of local materials as well as economies of scale and modern building technology. Sociological research also seems necessary to ensure that housing projects really involve the low income groups. Foreign aid often seems to run into obstacles in this field.

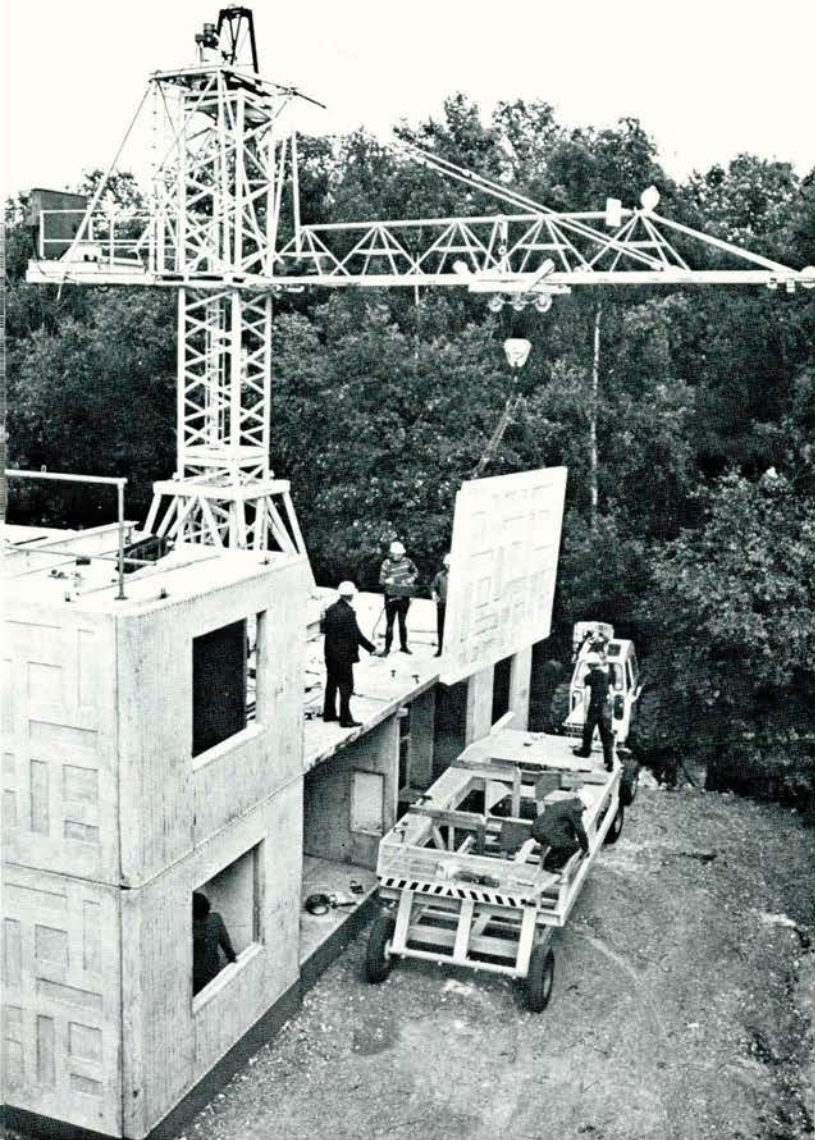
Materials research has enabled the United Kingdom to develop a high speed industrialised building system specially adapted to the needs of the developing countries: building is rapid and low cost; it uses large panels produced on the building site itself rather than in factories. The Ministry of Overseas Development is financing a pilot project using this method on the outskirts of Jakarta. The World Bank is participating in the financing of comprehensive urban projects including a \$15 million loan to Jamaica to improve the living conditions of people living in the shantytowns of Kingston. The project comprises self-help housing, essential community services, water, sewage and power linkage as well as technical advice. A \$35 million credit is helping to finance a project for basic urban facilities in Calcutta including water supply, sewage and drainage, environmental hygiene and housing.

### • *Land Reform and Resettlement*

It is difficult for bilateral donors to play a role in operations involving a major redistribution of assets within a country. External aid could take the form of guarantees for bonds given as compensation to former owners, but so far neither bilateral donors nor multilateral aid agencies have extended such guarantees although they could conceivably overcome a major political obstacle to land reform.

The United States provides some technical assistance in support of land reform programmes. The United Kingdom gives both financial and technical aid to agrarian reform in all its aspects, for example, rules governing relations between owners and tenant farmers and programmes of redistribution to small farmers. Thus in Kenya and Swaziland land consolidation (for example planning and distributing small plots) facilitates more rational exploitation while in Kenya, the Caribbean and Malawi a public property register has been established. Several Member countries (Sweden in Tunisia and Zambia, Switzerland in Bhutan, Canada in Bangladesh) have undertaken land reclamation and compensation programmes.

The World Bank is extending a \$40 million loan to Malaysia to help finance the Johore Land Settlement Project which will settle 4,400 landless families or small-holders with less than two acres of land and provide the basic infrastructural framework.



control. Statistical research, research on the biological and social aspects of human reproduction, education, communications and training accounted for the rest.

In recent years developing countries have tended to channel their aid for demographic activities through international organisations. Nevertheless bilateral aid in 1973 came to \$100 million as against \$68 million from multinational organisations. Non-governmental bodies are particularly important in this field and they devoted some \$60 million to demographic activities in 1973. Their specific contribution has been to awaken the public in developing countries explaining the importance of demographic problems and giving the impetus to small experimental projects combined with educational sessions in birth control.

### • *Women and Development*

Many countries attach increased importance to the influence of development programmes on the situation of women in developing countries. Most of the support in this field is given in the form of courses and seminars, research work and contributions to the work of multilateral agencies. Thus, for example, when Sweden elaborates a bilateral programme, its impact on the situation of women is often discussed with the recipient country.

France which is particularly active in stimulating rural activities especially in Africa devotes considerable efforts to improving the

# INTERMEDIATE TECHNOLOGY:

## A New Approach to Development Problems

*Promotion of modern large-scale industries in the developing countries can be very costly in economic and social terms and tends to benefit the people living in cities while doing little to meet the basic needs of rural communities. The use of what has come to be called "intermediate", "low-cost" or "appropriate" technology, which creates labour-intensive activities on the spot, can help to solve this problem. In the following article Nicolas Jéquier, of OECD's Development Centre, summarises the discussions of a recent OECD seminar on the subject (1).*



Virtually unknown until very recently, intermediate technology has aroused considerable interest on the part of aid donors and developing countries alike as an effort to avoid two extremes in development strategy: the massive import of foreign technology regardless of its suitability for local conditions and complete rejection of this technology (2).

Intermediate technology does not exclude the use of capital intensive or sophisticated technology when appropriate but attempts to promote a parallel development of labour-intensive projects which are relatively simple but well adapted to the social and economic environment and which make use of the inventive and innovative capacities of the local population.

The ox-driven plough, recently introduced in several tropical African countries, is a good example of *intermediate* technology; it stands, so to speak, half-way between traditional hand-operated tools like the hoe and modern machinery like the tractor. The solar pump developed by a French company in co-operation with Dakar University is one of several examples of *appropriate* technology; it harnesses a widely available source of energy, namely the sun, to supply villages with much more water than an ordinary well can supply. It is now being introduced on a

large scale in Mexico. A system of water purification developed in Thailand using rice and coconut husks which would otherwise be thrown away is an example of *low-cost*—or even *zero-cost*—technology.

Although the concept of intermediate technology has only become current within the last five years, its underlying philosophy is much older. In India the policy of promoting what today would be described as intermediate technology originated in the ideology of the great social reformers of the end of the last century and in Mahatma Gandhi's fight against British rule before the Second World War (3). Likewise the Chinese approach of "walking on two legs"—using both modern and traditional technology—stems from the ideas of Mao Tse Tung.

Contrary to what one might expect, the industrial experience of the United States is also highly relevant; three lessons may be drawn from it for the developing countries. First, the rural areas played a vital part as centres of invention and innovation (which is less true of Europe); for example, Henry Ford, Cyrus McCormick and Eli Whitney, to name but three, all came from farming families. Secondly, production methods were adapted to unskilled labour with no craft traditions, a problem facing most



*The ox-driven plough is a good example of intermediary technology being halfway between traditional farm tools like the hoe and modern machinery like the tractor.*



of the developing countries today. Thirdly, the decentralised political and social system was a very important factor in keeping alive the spirit of initiative and innovation at local level.

The interest in intermediate technology also has affinities with some schools of thought which are now to be found in the industrialised world, in particular those which advocate the use of "soft" technologies and on a better ecological balance between nature, technology and society.

## The Market

Assessing the market for new technologies is not at all a simple matter and most of the failures in innovation are due to incorrect assessment of market potential rather than to technical deficiencies. Most practitioners of intermediate technology realise the difficulty and know that even a basic need is not always translated into a well articulated demand. There is clearly no infallible solution. One method, which requires much time and cultural sensitivity is to get the villagers directly involved in the innovation process by asking *them* to define what their most important needs are and offering them a choice between different technological

options. Another approach which is sociologically simpler but technically more difficult is to offer a much larger choice of new intermediate technologies which are competitive with both traditional and modern technology. Intermediate technology can only succeed in meeting the needs of the hundreds of millions of farmers who have been almost completely left out of the development process if it is truly competitive on commercial and technical but also on social and cultural grounds.

## Innovators ...

The groups which are now contributing most actively to the development of new intermediate technologies generally fall into one of the three following categories: governmental and government-related agencies, universities, and non-profit institutions, the latter often being of multinational origin (see box). Although

## The Main Intermediate Technology Centres

The main intermediate technology centres are:

- Intermediate Technology Development Group Ltd. (London);
- Brace Research Institute (Ste Anne de Bellevue, Canada);
- Appropriate Technology Cell (New Delhi);
- Planning Research and Action Division (Lucknow, India);
- Appropriate Technology Development Unit (Varanasi, India);
- Industrial Development Division, Engineering Experiment Station (Atlanta, United States);
- Volunteers in Technical Assistance (Mt. Rainier, United States);
- Division of Microprojects (Eindhoven, Netherlands);
- Appropriate Technology Centre (Islamabad, Pakistan);
- Technology Consultancy Centre, University of Science and Technology (Kumasi, Ghana);
- Agricultural Engineering Department, The International Rice Research Institute (Manila, Philippines).

(Further information is available from the OECD Development Centre, 94, rue Chardon-Lagache, 75016 Paris.)

the effectiveness of these various groups seems to depend mainly on the personality of their founders and on a spirit not unlike missionary zeal, their institutional structures are also of importance. Universities usually have a considerable technological capability, but their first mission is educational and they are geared almost entirely to modern technology.

The government and semi-governmental organisations usually have large financial resources and can exercise a positive influence on policy decisions, but they are often somewhat cumbersome and their government connections make rural populations rather suspicious of them. The private organisations are per-

(1) *The report of this seminar will be published at the beginning of 1976. A preliminary report containing a synopsis of the discussions and a summary of case studies is available from the OECD Development Centre, 94, rue Chardon-Lagache, 75016 PARIS. It is entitled "Low-Cost Technology: An Enquiry into Outstanding Policy Issues" (English version only).*

(2) *The basic book on intermediate technology is E.F. Schumacher's Small is Beautiful, Blond and Briggs, London, 1973.*

(3) *The Gandhian Institute of Studies is one of the main centres for developing intermediate technologies in India.*

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haps more effective because of their contacts with the outside world and the flexibility due to their small size, but their financial position is often very precarious.

### ... and Entrepreneurs

How are these technologies, which are suited to the needs of rural populations, to be diffused as widely as possible? This is where the entrepreneurs come in, the craftsmen, small industrialists and farmers, who are both willing and able to take certain risks and who can translate the technologies developed by the public or non-profit groups into economically and socially viable innovations. For reasons which may be social, cultural or political, these entrepreneurs often go into activities which are economically unproductive, while those who do attempt industrial innovations usually find themselves faced with unsurmountable difficulties, many of which result indirectly from the government's development effort. For example, all investment decisions must be approved by the planning authorities, imports of machinery are very difficult, and the subsidies granted to large-scale industries tend to kill off small firms which use local technology. In fact the problem is not so much how to stimulate entrepreneurship—for it exists almost everywhere—as to refrain from stifling it in a systematic if involuntary way.

## Intermediate Technology and Public Authorities

The growing interest aroused by intermediate technology, both in the industrialised countries which supply aid and in the developing countries which have not benefited from the oil crisis, necessarily calls for some sort of co-ordination with national policies for science, technology and industry, although many practitioners are somewhat sceptical about the role which governments can play. If it is too early to set forth the exact content of overall policy to promote intermediate technology, it is possible to note some of its main lines.

### • *Information and Technical Assistance Services for Enterprises*

One of the conclusions which emerges most clearly from discussions among practitioners of intermediate technology is that the technical assistance which the governments of many developing countries provide for small enterprises must be made less expensive and more effective. Their contribution to the actual diffusion of intermediate technology is at present marginal. Information services are also very expensive and mainly benefit enterprises whose technical and industrial potential is already large.

### • *The Banking and Credit System*

In most developing countries small entrepreneurs usually have great difficulty in obtaining bank loans, the banks preferring to lend to large firms. Experiments in India, however, show that it is possible to change this state of affairs by establishing a system of insurance against credit risks and by familiarising the managers of banks and other credit institutions in the particular problems of innovation in small industry.

### • *Local Technological Traditions*

All over the world successive generations of craftsmen and farmers have accumulated an immense stock of knowledge and



*A young boy prepares spools of thread for home weaving on a spinning wheel built from an old bicycle.*

know-how, but these technological traditions are now rapidly disappearing, largely as a result of the development of modern industry. Without trying artificially to preserve the past and turn the rural areas of developing countries into technological museums, it is possible and often desirable to use this know-how as a basis for further innovations; the art of the village blacksmith, for example, can be very useful in making small-scale agricultural machinery and the art of the potter in constructing irrigation and water supply systems.

### • *The Role of Primary Education*

As the universities and large-scale industry provide the basis for our modern scientific and technological system, the primary school should be a key instrument in building up an innovation system in intermediate technology. One of the primary school's functions should be to give children some understanding of technology and to stimulate their inventiveness and interest in innovation. Teacher training schools have an important role to play in this respect.

### • *The Need for Decentralisation and Local Initiative*

In the developing countries as well as in many industrialised countries, the scientific and technological system is highly centralised administratively and very concentrated geographically, but experience seems to show clearly that decentralised systems are more conducive to innovation and to stimulating the entrepreneurship and initiative found at local level. Indeed, decentralisation would appear to be one of the necessary conditions for the success of intermediate technology. Rather than try to co-ordinate everything at national level it would be desirable to allow for more disorder and to try to stimulate rather than reduce competition and overlapping. If there has to be planning in this field, it should be regional rather than national.



Intermediate technology is now becoming popular and the success of several experiments shows clearly what results it can yield, but it must be remembered that they are not yet numerous or large-scale. It would be premature to expect miracles: success in this field requires much time, and time is precisely the scarcest commodity in the countries seeking rapid development.

# How to Estimate the Real Cost of Environmental Damage

The expense involved in installing pollution control equipment—and, more generally of taking steps to protect the environment—may seem prohibitive if considered in isolation. But to put these costs in the proper perspective, they must be compared with the expenditure society would have to bear if no action were taken.

OECD's Environment Directorate has

examined the question of how to put a monetary value on environmental damage; the most significant conclusions are summarised below (1).

## A Necessary Task ...

Any evaluation of environmental damage must start by directly quantifying

(1) A volume was recently published on this subject: *Environmental Damage Costs*, OECD, Paris, 1974. See also *Problems of Environmental Economics*, OECD, Paris 1972. A technical handbook on damage functions is in preparation for the use of decision-makers dealing with environmental policy.

*Testing of a noise barrier along a French motorway.*



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physical or even psychic effects—how many people are disturbed by a given noise level, for example, or are suffering from respiratory ailments due to atmospheric pollution. These are called *non-monetary damage functions*.

While these functions are the basis for making quantitative estimates of damage, they are in themselves of only limited use and should be regarded as only a first step, for by its nature environmental damage is very varied. For example, a motorway causes atmospheric pollution, water pollution by run-off, noise, esthetic damage, ecological damage, and so on. The problem is how to compare these different forms of pollution one with another and with the cost of the measures which could abate or prevent them. The answer is to make a monetary estimate of the damage, i.e. to calculate its *costs* to the community.

Such a monetary estimate enables several projects to be compared and the best one, i.e. the one which is the least bad for the environment, to be chosen. Another advantage is that it facilitates a calculation of how far one should go in controlling pollution, since in many cases it is no more desirable to "depollute" completely than to allow unbridled pollution: "depollution" too involves a cost which must be compared with the cost of the damage caused by pollution. Economic estimates can also be used to establish *environmental standards* which give maximum benefit to the community and, if necessary, to fix the rate of *charges levied on pollution* to attain those norms. A monetary estimate is also very useful, for obvious reasons, in systems which provide *compensation for damage*. Given the utility of such estimates, how are they to be made?

### ... But a Difficult One

Monetary damage may be defined as the sum of money required to compensate people who have suffered from a given environmental hazard. To estimate it one should distinguish between two types of damage involving either financial loss or loss of amenity.

By *financial loss* is meant expenditure due to degradation of the environment. This is an economic loss which can on the whole be directly calculated. Costs of atmospheric pollution have already been subjected to considerable study. The results are not always convergent nor do they necessarily cover the same cate-

gories of damage, but in general they distinguish between direct and indirect financial loss.

Direct financial loss includes damage done to materials exposed to pollution—varnish and paintwork, buildings, corrosion of materials, etc. Here the costs of cleaning, repair or replacement provide a direct money estimate of the damage. To this kind of loss must be added possible damage to vegetation, including deterioration of crops. The effects on

health are more difficult to deal with. How, for example, is one to determine the exact relationship between atmospheric pollution and various kinds of disease? When this relationship becomes known, the medical expenditure involved in treating the medical disorders can serve as a basis for making the monetary estimate. Indirect financial loss includes reduced output from manpower (sick leave) or even economic loss due to premature death.

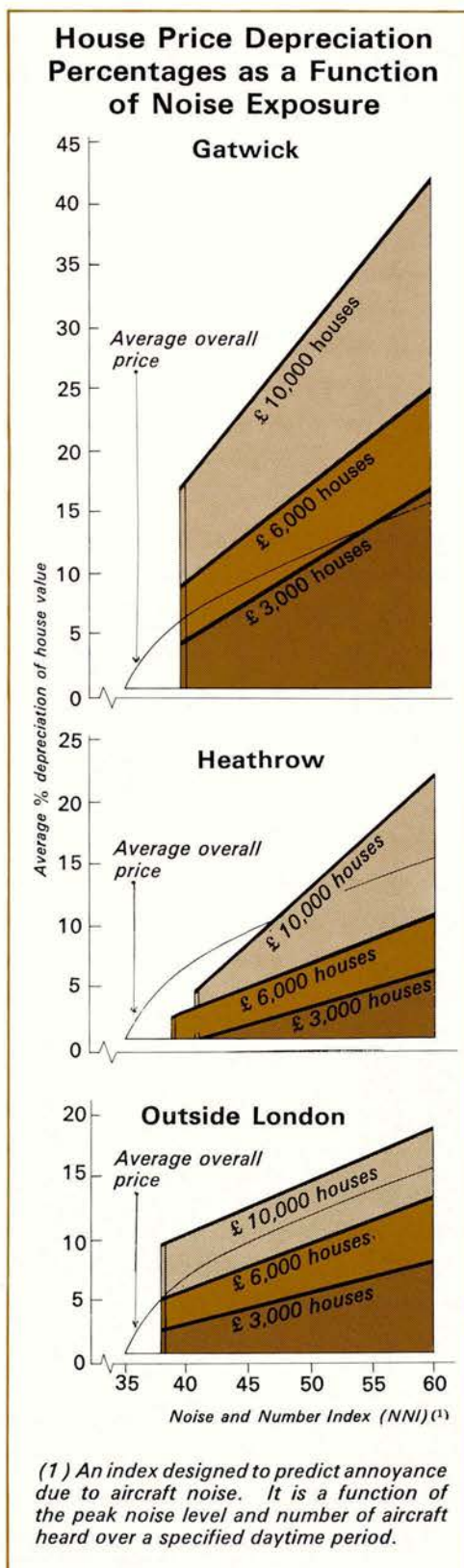
*Loss of amenities*, sometimes called "intangible" loss or "psychological cost", includes all forms of non-financial loss such as pain and suffering, esthetic offence, disturbance from noise, reduced recreational facilities (hunting and fishing), and so on.

Putting a money value on such intangible subjective factors is doubtless a difficult undertaking but a necessary and not always impossible one. For example, attempts have been made to deduce estimates of disturbance caused by noise near airports from the fall in the value of real estate in the neighbourhood and from the expenditure required to sound-proof housing. As regards water pollution, its impact on recreational facilities can be estimated by relating the loss of amenities to the fall in demand for a specific resource or activity, for example the way in which the number of people using an expanse of water changes with the degree of pollution.

While a monetary estimate of environmental damage is an instrument of special value to the decision-maker—though not the only one—it involves much uncertainty, especially where loss of amenity is involved.

However, even if a money estimate is not accurate, it can be useful. Take, for example, a project which is designed to improve the environment. A comparison is desired between the likely environmental benefits therefrom and the cost of carrying out the project. If one's estimate of the benefits is known to be lower than their real value but higher than the cost of carrying out the project, it will be as useful as a more accurate estimate because it leads to the same conclusion—to carry out the project.

Current environmental policies are still often based on purely qualitative and not very reliable data. Decision-making could therefore be improved, if we had a more thorough and accurate knowledge of non-monetary functions and could make better estimates of the monetary functions.



# Better Towns with Less Traffic

*"Towns are better with less traffic: so long as adequate provision is made for the mobility of workers and residents and the distribution of goods."*



This conclusion is one of those reached at an OECD Conference on "Better Towns with Less Traffic" held in Paris in April (1). The meeting, chaired by Prof. G. Scimemi of the University of Rome, opened by Ingrid Leodolter, Austrian Minister of Health and the Environment and attended by nearly 300 delegates from 23 countries, also endorsed limits on the use of cars and goods vehicles "when and where traffic congestion and its costs are severe and frequent".

The thinking about urban transport policy that emerged from the Conference had been foreshadowed by a survey of 300 cities with populations of 100,000 or more carried out by OECD. The returns show that municipalities which had previously relied largely on parking management and pedestrian areas to control traffic, are increasingly complementing these techniques with bus priorities and other measures that act positively in favour of public transport and thus can, in the opinion of the Conference, lead to an improvement in the environment.

At the Conference itself national statements of policy and case studies of seven towns—Besançon, Bologna, Munich, Nagoya, Nottingham, Singapore and Uppsala—told the same story but in much greater depth. →

*(1) The Conference conclusions together with the case studies of the seven cities and the summaries of the specialised sessions on such subjects as wider economic and energy issues, para-transit, and policies towards pedestrians and cyclists will be available shortly under the title "Proceedings of the OECD Conference on Better Towns with Less Traffic" from OECD's Environment Directorate, Urban Environment Division.*

*Time penalty... in Nottingham traffic signals are to be used to create "voluntary congestion" in order to limit the flow of cars into the city centre.*

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Nagoya, for instance, has 62 km of bus lanes used by 30 different bus routes, while both Uppsala and Besançon have bus-only streets that enable public transport vehicles to penetrate to parts of the centres of those cities that are out-of-bounds to cars. Nagoya has also made unprecedentedly wide use of techniques for protecting residential areas from through-traffic. Building on the experience of cities such as Bremen and Gothenburg, Japanese traffic engi-

neers have brought safety from through-traffic to about 100 square kilometres of Nagoya by means of NO ENTRY signs, one-way systems and short stretches of pedestrian streets.

### Penalties — Time or Cost?

However, such techniques may have the effect of merely redistributing traffic,

and some cities are therefore developing techniques capable of producing reductions in traffic over extensive areas in order to stop congestion from blocking buses and damaging the service they give. At Nottingham, for instance, traffic signals are to be used to limit the flow and number of cars entering the central parts of the town. And in Singapore, supplementary vehicle licenses (i.e. permits delivered against the payment of a special charge to allow the entrance of vehicles into the central area) are being introduced, together with increased parking charges, to raise the cost of commuting by car into the city centre. Park-and-ride interchanges served by express buses and exemption from charges for cars carrying four or more persons will enable people to go on getting to and from work even though fewer vehicles are in use.

Nottingham's techniques, which are due to come into operation before the end of 1975, rely on imposing penalties of *time* which will fall equally on all motorists while the Singapore approach, which is just starting now, rests on penalties of *cost* which will inevitably fall more heavily on poorer than on wealthier motorists. The fairness of this rationing by price was questioned at the Conference. A Singapore official said that his government had given careful consideration to this issue and had decided that pricing alone of all restraint techniques promised to be effective. He also noted that no exceptions—for doctors, diplomats or cabinet members—would be granted. The Singapore government, unique among the authorities described in the seven case studies, is also intent on curbing the growth of car ownership.



... and cost penalty; in Singapore supplementary vehicle licences have been introduced to limit traffic in the city centre.

NO 99982 DECEMBER REGISTRY OF VEHICLES SINGAPORE MONTHLY AREA LICENCE DISC FEE: \$ 50 Issuing Office Vehicle Reg. No.			printed figures for month December shown on sample  position for stamped figure for year
NO 99987 DECEMBER REGISTRY OF VEHICLES SINGAPORE DAILY AREA LICENCE DISC Fee: \$ 7 Issuing Office Vehicle Reg. No.			printed figures for date 16th shown on sample  position for stamped figures for month & year

## Improving Mobility

Limits on the use of cars are in all cases accompanied by measures to improve mobility by other means. Thus both Nottingham and Besançon have introduced new city-centre bus services that link stations and car parks with the main shopping and commercial streets. Both cities have expanded their bus fleets as well, in order to increase the frequency of service. Bologna has eliminated fares for rush hour travellers. Singapore is providing places for the owners of 10,000 vehicles to park on the fringes of the inner city and then ride on by express bus.

Experiments are also underway on



Opposite: Besançon — evenings and weekends, shared taxis replace municipal buses.



Below: Bologna — public transport is free during rush hours.



new kinds of public transport called "para-transit" that are designed to give more personal service than is possible with municipal buses. One of these involves the use of shared taxis in place of buses during evenings and at weekends. Services of this kind are in operation in Besançon and Munich. Experiments are going on elsewhere with dial-a-ride services that take travellers from door to door and with services to help car commuters give and get lifts from their neighbours thereby making greater use of smaller numbers of cars.

Other forms of transport are not being neglected. Nagoya has created a 284 km long network of cycleway, and a city-wide system of segregated pedestrian and cycleways in Vasteras in Sweden has led to increases in the use of two wheel transport.

While it might be thought that measures to limit the use of cars would be confined to cities where ownership levels are very high, this does not appear to be the case.

Thus, Singapore, Nottingham and Besançon are all intent on comparable objectives even though the number of inhabitants per car is 15, 5 and 3 respectively. The explanation is that congestion, declining transit services, traffic accidents and mounting environmental pollution are serious at all stages in the process of urban motorisation.

The case studies presented at the Better Towns with Less Traffic Conference also revealed that traffic restraint is being pursued in cities of very differing size as is indicated by the population figures for four of the cities examined: Nagoya (2,300,000), Singapore (1,500,000), Nottingham (548,000), Uppsala (105,000).

### **Rapid Implementation and Low Cost**

A recommendation made by OECD Environment Ministers in November 1974

stressed the importance of policies composed of rapidly implemented low-cost measures. The Conference accordingly did not study long term urban infrastructure building programmes with budgets which may run into hundreds of millions of dollars. On the contrary the measures being taken for instance in Nagoya to protect residents from the danger and noise of through-traffic work out at about \$ 30,000 per square kilometer, while the city's entire four year programme for limiting the ill-effects of traffic and improving public transport is costing \$ 28,800,000.

At Besançon the cost of extensive pedestrian areas, improvements to a diversionary traffic route ringing the city centre, new buses and a new bus depot is \$ 7,684,720. At Uppsala \$ 119,083 has been spent on environmental traffic management and at Nottingham \$ 217,013 a year is being spent on running improved bus services.

The implementing of traffic limitation policies typically begins within a year of an initial decision and then goes on for three or four more years. At Besançon, however, the pace of change was faster. A new policy was announced in January 1973 and was largely effective by October 1974. Speed has been of the essence in Singapore and Nottingham too.

The case studies in traffic limitation specify how the new approaches to mobility tie in with other objectives of public policy such as improving the environment and conserving energy and also describe popular reactions. While it is clear that further study is needed to identify the precise nature of energy savings resulting from traffic limitation, opinion polls carried out in Uppsala leave no doubt about the feelings of residents at least in that city. Following the introduction of priorities for pedestrians, cyclists and buses, 63 per cent of city centre residents and users expressed themselves to be very or fairly positive about the changes, while 79 per cent of bus passengers, 67 per cent of cyclists and, perhaps most surprisingly, 54 per cent of car drivers were also favourable.

### **The Consequences**

The new policies have brought about certain identifiable benefits. In Nagoya, for instance, the introduction of "traffic cells" designed to protect over 100 square kilometres of the city from the danger and nuisance of through-traffic, produced a 43 per cent reduction in deaths within

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the protected areas and on roads surrounding them. An average decline in noise of 3 decibels was also recorded within the cells.

The other side of the coin is revealed in cities such as Nottingham where the new central area bus services carry up to 100,000 passengers a week, and Besançon where a 31 per cent increase in passengers was recorded in the three months after the new arrangements came fully into operation.

Changes in policy frequently call for changes in methods of administration. Thus in Nagoya the new policies were worked out by an ad hoc traffic management committee composed of councillors and engineers which are attached to the prefect of police. And in Singapore a Road Traffic Action Committee was set up to design and implement new policy. In these and other cases the emphasis appears to have been on creating management groups that bridge departmental divisions and have clear objectives.

Would these policies to limit the use of private cars in towns—and to improve the service provided by alternative modes of transport—have a significant impact on production or employment at the national level? The discussions held during the Conference suggest that, on the whole, they would not. The drop in overall demand for private cars is likely to be limited because such policies are only likely to be implemented in cities of a certain size where traffic problems are severe and will therefore affect only a proportion of the cars (cities of more than 100,000 inhabitants have only 20 to 50 per cent of the cars in OECD countries).

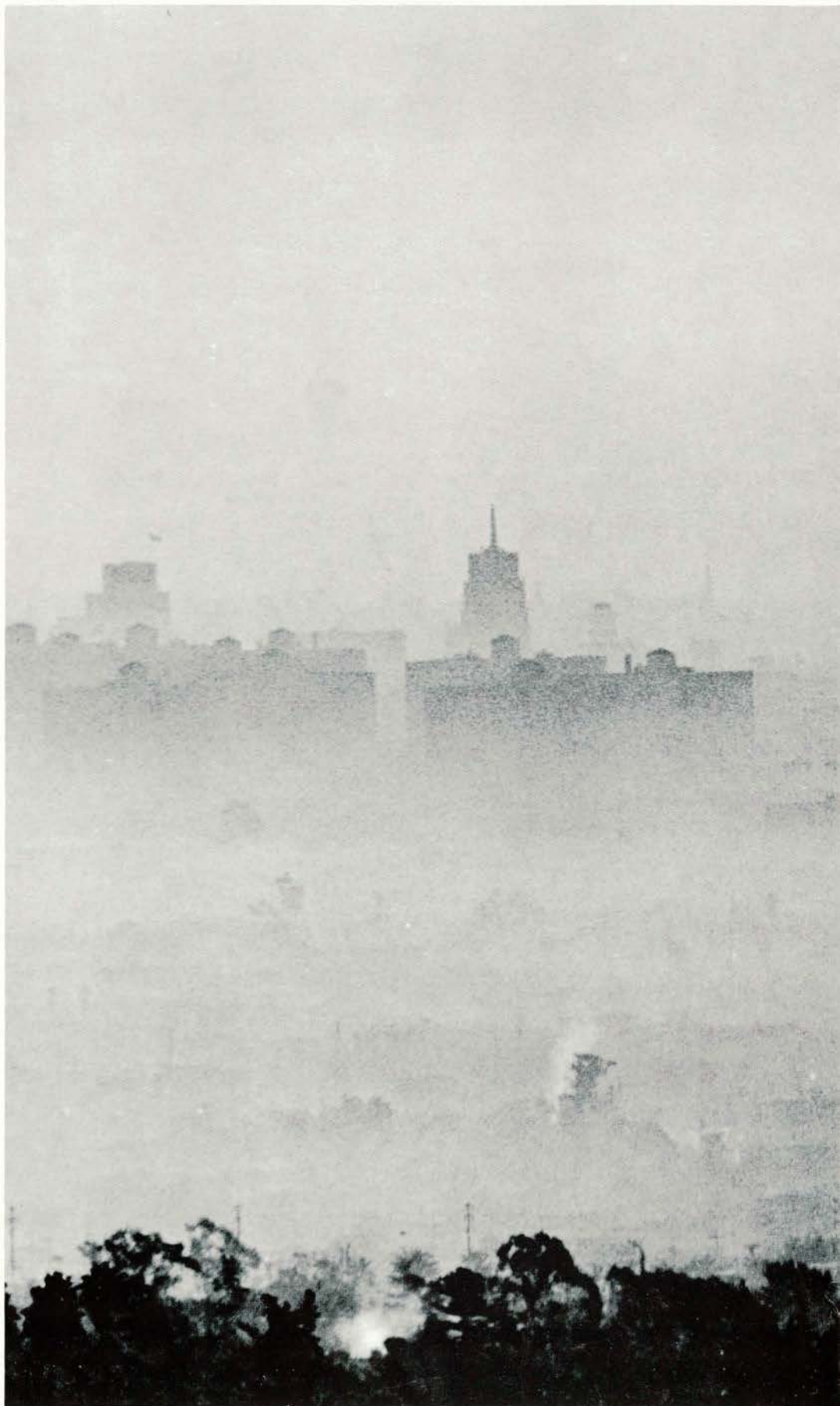
The drop in car sales moreover is likely to be compensated for by an increased demand for buses and other transport equipment and services generated by these policies.

Policies to limit vehicle traffic will also help to conserve energy in cities since private motor vehicle traffic is more fuel-consuming than most alternative modes (i.e. public transport, paratransit, etc.).

One of the most important tasks for the future is to evaluate and disseminate experience with measures, such as planned congestion and supplementary vehicle licenses, that are still moving from the realm of theory into actual practice. It is one thing to agree that towns are better with less traffic: it is another to make this new policy a matter of widespread, everyday practice.

*Photochemical smog was observed for the first time thirty years ago in Los Angeles.*

# Photoch



# Chemical Smog

*The increasingly frequent appearance of photochemical smog has become a matter of at least potential concern to virtually all the OECD countries. The reason is twofold: first, nearly 86 per cent of the global consumption of energy occurs in the band between 30° and 60° North; second, meteorological parameters favourable for oxidant formation—and hence for smog—such as atmospheric stability, plentiful sunshine and low wind speeds, occur periodically in most of these regions.*

*"Air Pollution by Photochemical Oxidants", a report to be published shortly by OECD, compares the experience of three countries for the first time. The three, all of which are OECD Member countries, are Australia, Japan and the United States and the main points of the comparative report are set out below. The Air Management Sector Group of the Environment Directorate intends to extend this initial study to Europe and Canada.*

**A**t the present time, there is insufficient knowledge of photochemical air pollution and its control; a comparative analysis of the experience of countries suffering from this problem can therefore yield information of great value. The three countries which have piloted this OECD study have described their national experience in case histories which has made it possible to collect, review and evaluate all available data relative to the formation and control of photochemical smog. The intention is to assist all Member countries to identify this phenomenon and to institute appropriate controls.

## What is "Photochemical Smog"?

"Photochemical smog" was first observed in Los Angeles in 1944, and is a type of air pollution that is quite different from the smog which arises under foggy conditions, especially in winter, from emissions of smoke and sulphur oxides and which caused thousands of deaths in London in 1952. In contrast, photochemical smog consists of a number of toxic compounds including ozone, nitrogen dioxide, peroxyacetyl nitrate and small particles. Because of certain chemical properties, these components are often referred to as oxidants. They form in the atmosphere as a result of reactions between certain organic compounds, such as hydrocarbons and oxides of nitrogen. Since they are not emitted directly from any source, the smog components are called secondary pollutants, while the hydrocarbons and nitrogen oxides are primary pollutants and are often referred to as photochemical smog precursors. Most of the reactions which result in the formation of smog occur only in the presence of direct sunlight, hence this smog is more severe during the warmer months.

## What are the Effects of Photochemical Smog?

The main effects on people are irritation of the eyes and throat, more frequent attacks in asthmatics and impairment of lung function. Photochemical air pollutants also cause damage to vegetation, result in the fading of colours in fabrics, attack rubber-based products and reduce visibility.

The effects first noticed in Los Angeles were vegetation damage and reduced visibility; shortly afterwards, eye irritation became a common complaint in that city. Similar difficulties were noticed at the beginning of the Fifties in New York and in the San Francisco area. In Japan, it was in 1970 that oxidants were first judged to have caused health damage, although significant concentrations had been found in previous years. High school students began exhibiting various physical complaints including eye irritation, sore throat, difficulty in respiration and, in extreme cases, numbness of the limbs. It is not certain however that the last two symptoms were caused by photochemical air pollutants. This incident was followed by many other similar incidents not only in Tokyo and its environs but in other large metropolitan areas.

In Sydney in November 1971, substantial damage to vegetation and considerably reduced visibility were reported at the same time as high oxidant values were recorded. Elevated ozone levels as well as other manifestations of oxidant pollution have been observed recently in other countries, notably Germany, Canada, the Netherlands, the United Kingdom and Sweden.

## How does it Propagate?

When first identified, the damage caused by photochemical smog was essentially local, being limited to the areas immediately surrounding major industrial towns. Damage is now spreading also to rural areas where it is carried by local winds. However, in some regions such as in the Netherlands, the relative proximity of urban centres and highly industrialised areas cannot be the main cause of the high oxidant concentrations measured at recording stations in rural areas. It must rather be assumed that in this case the precursors (hydrocarbons and nitrogen oxides) are transported from the major source areas and dispersed over a large area.

The control of primary pollutants is based on the expectation that atmospheric concentrations will decrease in proportion to the reduction in emissions. But the complex relationship between the secondary pollutants or oxidants and their primary precursors makes this theory less than certain.

Strategies for abating oxidants aim to reduce either the oxides of nitrogen or the hydrocarbons or both at once. Because of the expense involved in reducing these emissions, it is important to avoid excessive or unnecessary control. However, it could be 10 years or more before effective action is taken against certain pollutants, e.g. emissions of nitrogen oxides from motor vehicles. In the meantime, the problem can become considerable.

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rably worse; its impact on health and agriculture could have substantial human, economic and/or political consequences. Moreover, if a control decision is made that is wrong or ineffective, it will be five years or more before this is realised. Therefore early identification of an oxidant problem, correct selection of the control strategy and rapid implementation of the controls are vital.

### What Steps have been Taken to Control Photochemical Smog ?

The abatement policy developed in the three pilot countries are related to the degree and frequency of adverse effects and the major sources of precursor emission. The increased awareness of the smog problem has resulted in a progressive shortening of the time between the onset of adverse effects and the development of control measures.

Efforts are now being directed towards formulating more reliable predictions about the likelihood of a worsening of the photochemical smog problem where it already exists, and its appearance in areas which have not yet been affected. Policies are under constant review in order to take account of progress made in understanding the problem.

In the United States, abatement policies were first developed for the city, but as the cause and extent of the problem became clearer, State governments and ultimately the Federal government began to implement control measures. Initially, when the cause of photochemical smog was not known, efforts were directed to controlling emissions of sulphur dioxide, smoke and solid particles. It was not until it was demonstrated that photochemical air pollution arose from the reaction of nitrogen oxides and hydrocarbons that abatement policies could be developed on a more rational basis.

In order to avoid development of undesirable levels of photochemical oxidant pollution, it is necessary to reduce the ambient concentration of the precursors. Measures for doing so are usually based on emission control regulations or standards.

It is important to note that, owing to the temporary and usually infrequent nature of photochemical oxidant air pollution, it is also possible to envisage certain measures similar to those used for other types of pollution in emergency situations. Such measures are directed not at the emission itself but at the activity generating the pollution: for example cutting back or completely stopping fuel combustion in fixed installations and, as far as motor vehicles are concerned, prohibiting traffic in specific areas where a photochemical oxidant air pollution situation might arise a number of hours later.

### What is the Cost of Abating Photochemical Smog ?

The cost of abating pollution includes the cost of implementing the abatement measures and the cost of the measures themselves. The former includes the costs of research, development, planning, monitoring and enforcement needed to achieve environmental goals and standards; the latter, which is greater, is the cost of actually reducing the pollution.

No reliable estimate of the implementation costs related to oxidant control in the United States has been made, but quite

detailed estimates are available for implementation costs to the Federal government for all air pollutants. In 1972, these costs exceeded \$250 million, which is equivalent to 0.02 per cent of GDP.

In Japan, the cost to the national government of implementing the oxidant abatement policy in 1972 was 3.6 billion yen (1.1 billion yen for administrative costs and 2.5 billion yen for research and development), i.e. 0.003 per cent of GNP.

The available figures for the second type of cost, i.e. the cost of pollution control measures themselves, are not much better. For the United States, the cost of implementing air pollution abatement policies in general has been evaluated at \$2.4 billion for 1972 and about \$4 billion for 1973, equivalent to 0.2 per cent and 0.3 per cent of GDP respectively.

Only a fraction of these sums are diverted to control of emissions giving rise to oxidants. Primarily emission control is directed towards hydrocarbons, particularly those from motor vehicles, storage tanks, catalyst regenerators in refineries and solvent evaporation.

The annual cost of controlling motor vehicle emissions to the standards approved by the Federal government has been estimated to be \$1.9 billion for 1973. This cost relates to the control of hydrocarbons and carbon monoxide and, to a lesser extent, nitrogen oxides. Since hydrocarbon emission control is necessarily accompanied by control of carbon monoxide, it is assumed that the hydrocarbon control cost is roughly one half of the total motor vehicle emission control cost, i.e. \$0.5 billion for 1972 and \$1.1 billion for 1973.

Control costs for hydrocarbon emissions from refineries have been estimated to amount to roughly 20 per cent of the total refinery control cost, i.e. \$14.6 million a year. No reliable estimates for solvent emission control costs are available.

Similarly, no estimate is available for the cost of hydrocarbon abatement in Japan. The figures available refer to nitrogen oxide control and have not been calculated with precision. However a number of estimates exist: the cost of modifying boilers alone is apparently 40 billion yen; the cost of reducing hydrocarbons and nitrogen oxide emissions from 1973 model automobiles is estimated to range from 3,000 to 20,000 yen per vehicle, depending on engine size. Cars fitted with smaller engines (1,000 cc) are three or four times cheaper to control than vehicles having engines of 2,000 cc.

Little information is available on abatement costs in Australia. However, annual costs of achieving reductions in emission levels by means of motor vehicle emission control are estimated at Australian \$30 million (1) for 1974, rising in future years. This estimate assumes 600,000 vehicles at a cost of Australian \$50 per vehicle, figures based on American experience.

The objective of the oxidant abatement policies adopted in each of the pilot countries is to reduce oxidant concentrations to levels that are acceptable from the health and environmental standpoints. It is anticipated that this objective will be achieved and also that other consequences will follow. The costs to communities represent a significant portion of the total cost of pollution abatement. So far, however, action to abate pollution has not caused significant or widespread economic hardship. In the United States, after the promulgation of some state imple-

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(1) 100 yen = US\$ 0.34 and 1.38 French francs.  
One Australian \$ = US\$ 1.50 and 6 French francs.

mentation plans, the Environmental Protection Agency has received complaints that economic hardship will be incurred if certain control strategies are maintained. There is no doubt that it is possible for certain abatement strategies to cause substantial social disruption, but no government has yet enforced a policy which would result in such disturbances.

Long-term abatement policies which entail changes in behaviour and social development can have economically

favourable effects. Land-use planning and greater use of public transport are two ways in which oxidants can be controlled.

Finally, it is clear that the control of oxidant precursors cannot be isolated from other demands on society, economics and technology. Resource management and energy conservation in particular are likely to affect the type of industry and vehicles that will be used in the future. Oxidant abatement strategies will have to be developed which take account of these changes.

## ABATEMENT TECHNIQUES

### Control of Hydrocarbon and Nitrogen Oxygen Emissions from Motor Vehicles

Manufacturers have two basic techniques of abatement for hydrocarbons :

- redesign or modification of existing installations: lower compression ratios, spark retardation (both basic timing and a "slower" advance curve), leaner fuel mixtures, etc.
- new installations: insulated and heat resistant exhaust manifolds, catalytic converters, etc.

Aside from inspection and maintenance other measures can help to reduce emissions from motor vehicles:

- partial substitution of public transportation for private cars in urban areas;
- application of exhaust emission control devices to uncontrolled light-duty vehicles;
- planning of freeways and traffic control systems to minimize stop-and-go-driving.

Some long range planning options are:

- emergency actions to reduce vehicular emission when unfavourable weather conditions create an air pollution emergency;
- governmental certification of maintenance and inspection personnel (sensitizing them to problems created by emissions).

\*

### Control of Hydrocarbon Emissions from Stationary Sources

Methods used to control emission of organic substances include substitution of materials, operational process changes, use of control equipment. Substitution of photo-chemically non-reactive materials for reactive ones is

used in cases where the organic emissions cannot be collected or incinerated by practical means. Such is the case, for example, with the organic solvent emissions from painting of buildings. Control devices are classified into four categories based on the following control principles: incineration, adsorption, absorption and condensation. The relevant industrial processes include: petroleum refining, gasoline distribution systems, chemical plants, paint, lacquer and varnish manufacture, rubber and plastic products manufacture, application of surface coating, degreasing, dry cleaning, stationary fuel combustion, metallurgical coke plants, sewage treatment plants and waste disposal.

\*

### Control of Nitrogen Oxides from Stationary Sources

Public utilities and industrial installations using coal, oil and gas as fuel are among the most important sources. There are three main methods of controlling this type of pollution:

#### • Staged Combustion

Effective for the control of both thermal nitrogen oxides (nitric oxide fixation by high temperature) and fuel nitrogen oxide (oxidation of nitrogen chemically bound in the fuel). Essentially, the method consists of initially contacting fuel with less than the amount of air ( $O_2$ ) required for complete combustion, then subsequently adding more air after a time delay in one or more steps or stages. This method appears to be effective with thermal fixation because peak temperatures are reduced. The effectiveness with fuel nitrogen oxidation appears to result from the lack of oxygen present for

combination with activated nitrogen atoms produced when the fuel molecule is "cracked" by high temperature as the molecule approaches and passes through the flame zone.

#### • Low Excess Air Operation

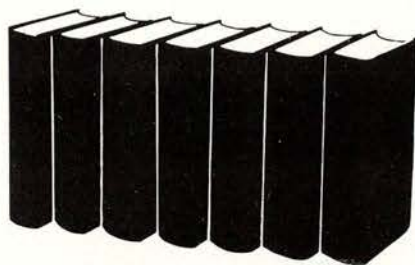
This method has been found effective in many boilers for reducing nitrogen oxide levels. Again the mechanism appears to be lack of oxygen availability for combination with either thermally activated or cracked fuel activated nitrogen atoms. This method has been combined with staged combustion to produce 40 to 70 % reductions in emission of nitrogen oxide consistently without seriously increasing carbon monoxide emissions.

#### • Flue Gas Recirculation

This method has been found to be effective for control of thermal nitrogen oxides. The recirculation of exhaust gases to the flame regions reduces peak temperatures and oxygen availability and thereby lowers nitric oxide formation. This method requires much greater capital investment and significantly increases operation control requirements, thus it is more difficult to apply.

Other methods currently under study include: burner design, water/steam injection, wet scrubbing with aqueous ammonia, load reduction, remixed fuel/oxidiser, removal of nitrogen from fuels, catalytic reduction of nitric oxide in stock processes and fuel substitution. Fluid bed combustion is a new concept under development presently at the pilot plant stage that holds considerable promise for using coal and at the same time reducing the generation of thermal nitrogen oxides.

Among the other stationary sources of nitrogen oxides are commercial and residential combustion, gas turbine and diesel engines, and nitric acid plants.



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