association news

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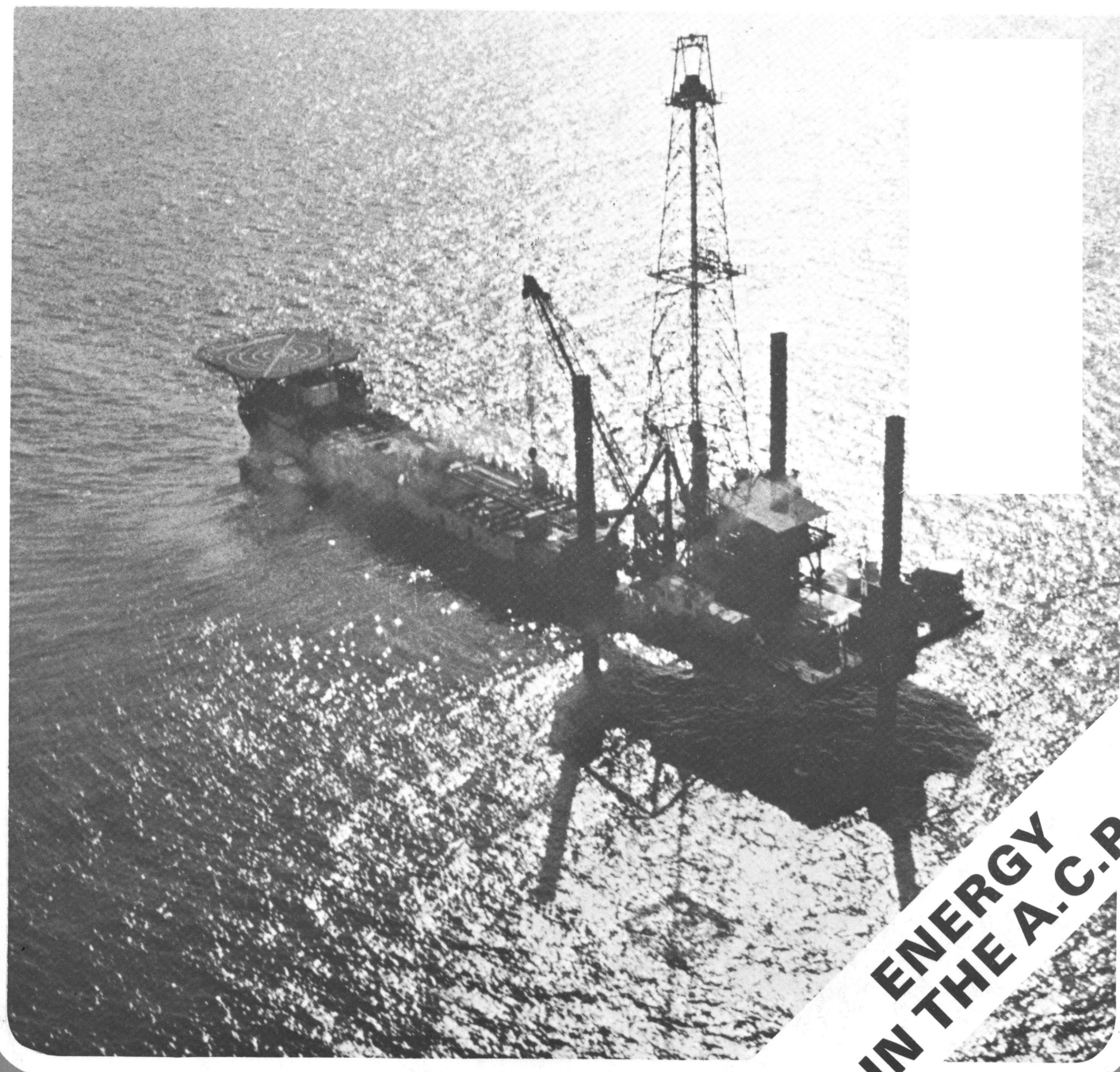


ENERGY IN THE A.C.P.

A NEW YEAR'S MESSAGE

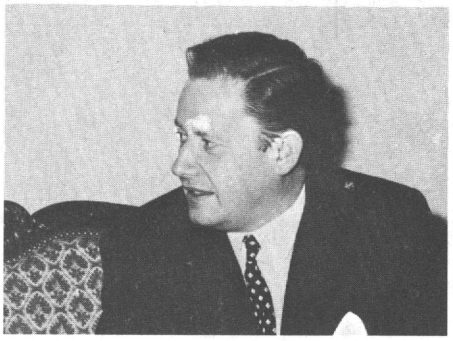
The year has turned, and "Association News" has a new cover. But the spirit in which the revue was created remains unchanged.

It is customary to take stock at such a time and I feel mutual congratulations are in order for the activity which, during 1974, marked the relations between Community, the Associated States, the future partner States and still others, resolved to maintain, enlarge or create the conditions of fruitful cooperation. The past year saw an increase in food aid; participation by the Community in the United Nations fund for the countries most seriously affected by the price rises in raw materials; progress in the negociations with the mediterranean countries; strengthened coordination between bilateral and international aid; and especially, the common will between the Community and the 45 States of Africa, the Indian and Pacific oceans and the Caribbean to reach a new Association agreement on the expiration of the Yaoundé Convention. In a difficult world, one can only emphasise that these are signs of cooperation bringing together people and nations on the basis of lasting common interests.

But 1975 is already with us to carry our hopes. At the dawn of this new year, I should like to take the opportunity to express my best wishes, in fraternity and in the hope of a more human and better balanced world, where each of us will be able to find the possibility of living as he chooses, in friendship with others.

E. WIRSING
Publisher

Gaston Thorn — "I consider M.Claude Cheysson must be thanked for having given a new dimension and a new impulsion to the Community's cooperation and development policy"... "I agree with your assessment of the importance of the results of the ministerial conference at Kingston"... "The Community owes itself not to let the spirit of cooperation with the Third World decay." **Page 3.**

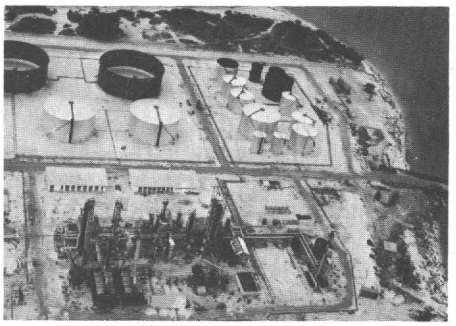


The Commission has been asked by the Council to put forward ideas on cooperation between the Community and the Third World for the coming years, in the context of the present and foreseeable world economic situation. M. Claude Cheysson recently presented this "fresco of Community action tomorrow" to the Press. **Page 6.**

The Europe-A.C.P. agreement "really offers a model for the establishment of a new international order between developed and developing countries" in the opinion of M. Oumar Sy, Senegalese Ambassador to Benelux. He adds: "The Senegalese have confidence in Eurafrica because it is an enterprise based above all on history in order to take the paths of the future. These paths of the future are to be found in cooperation between developed and developing countries". **Page 10.**

Fiji, Western Samoa, Tonga. Our interview with representatives of the smallest A.C.P. group in the negotiations covers their particular development problems and shows how they are affected in their relations with the European Community by their connections with the southern hemisphere and their importance as a crossroads in the world's biggest ocean. **Page 12.**

Energy is one of the vital subjects of the moment, especially for the A.C.P. States. A lucky few can take advantage of soaring oil prices to establish their own industrialisation. Most are thrown back into the gravest economic difficulties. The first Dossier of 1975 takes an overall look at the energy scene in the A.C.P. at a critical time, and traces the main lines of present and future energy sources. **Page 16.**



ASSOCIATION NEWS

No. 29 — January-February 1975

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EDITORIAL

Energy: A condition of development

For the past year, throughout the world, energy has been the subject constantly in the news. There have been many analyses, discussions and conferences, but very few of them have examined the problem from the standpoint of the A.C.P. What was lacking was a first survey of the resources, the equipment, the prospecting and research, and an attempt to assess the consequences of the rise in oil prices, survey the possibilities of other energy sources and appraise the interventions of the European Development Fund and the European Investment Bank, etc. To this end the Dossier in the present issue is devoted to the energy problems in the A.C.P.

The design is an ambitious one, and specialists will no doubt spot the shortcomings and limits of such a survey. We decided to take the risk, nevertheless, because the matter is so important and so topical, and many of our readers had asked us to tackle it. Without energy, there can be no industrialisation and, for practical purposes, no development. As things stand, more than half the 30 A.C.P. countries in Africa show a consumption of primary energy (1971 figures) of less than 100 kg coal-equivalent per head per annum, which compares with a world average of 2 000 kg. This is one of the most obvious indications of an inadequate state of development and is justification in itself for attempting, however lamely, to review the problem. Moreover, this is the first time the theme of our Dossier can be treated from the standpoint of the A.C.P. countries as a whole.

One fact is fundamental. In the energy consumption of the A.C.P. countries, oil is by a long way the most important primary source. For no less than 36 of the 44 countries, oil and its products account for 70% or more of their total energy consumption. Apart from a few countries, such as Nigeria, Gabon and the special case of the Caribbean, practically all the countries are net importers of energy, and in 15 of them the reliance upon imported energy is total.

Among the alternatives to oil, coal is comparatively scarce; natural gas is not widely available, except in the Caribbean; the mining of bituminous shale in Madagascar is up against technical difficulties; uranium, from which nuclear energy is derived, is produced exclusively for export; and other primary sources —such as solar, wind, tidal and geothermic energy—do not seem capable of playing more than a marginal role in the near future. In a number of countries of Black Africa, however, water power seems capable of playing a proportionately more important part than in most other countries.

In the world as a whole, water power appears simply as a useful supplement, contributing in 1970 the equivalent of only 300 m tons of oil in a total supply of 5 000 m tons oil-equivalent. Forecasts for 1985 put the contribution at only 500 m out of 11 000 m tons; and for the year 2 000 at 700 m out of nearly 20 000 m tons. Africa, however, is in a special position, for its hydro-electric, or water power, potential is very large indeed. It is estimated that Africa possesses two-fifths of the world's energy capital in this form.

About 90% of Africa's hydraulic resources are concentrated in the equatorial and tropical zones, because of the mountains and the abundant rainfall. Zaïre, for example, has within its borders 13% of the world's hydro-electric capital, or 50% of that of Africa; but its production of electricity is still less than 5% of this potential. According to the experts, the hydraulic potential in this part of Africa exceeds the energy equivalent of the combined oil and coal production of the entire continent. It may well be asked why these vast potentialities are not brought into more extensive use.

The chief reason, of course, is the very big investment needed. Moreover, geography dictates where the energy could be produced, and this is not necessarily in the same places as where it would be used. There is also the fact that many of these consumption centres do not have the present capacity to absorb electric energy to the full extent of the production capacity, and electricity is difficult to transport over long distances. The latter argument is only of relative importance, for Zaïre intends to transport the energy produced at Inga as far as Shaba, nearly 2 000 km away, which currently ranks as the longest transmission economically possible.

Also to be borne in mind is the fact that, even before the rise in oil prices, water power was already the cheapest way of producing electricity, provided the initial investment could be carried out. Water power differs from oil in that its availability does not run out but is constantly renewed by the annual rainfall. It does not pollute; and the necessary dam building has another important use in the irrigation of farmland, which makes it specially desirable in the Sahel countries so badly afflicted by the recent drought.

Underlying the whole problem, nevertheless, is the increased price of oil and its derivatives, because of the predominant part played by energy in this form. For the A.C.P. countries as a whole the bill for oil and petroleum products in 1972 was $395 m. In 1974 it will have increased to about $1 500 m and the estimate for 1975 is $2 100 m. The problem is world-wide, and can be overcome only by co-operative action leading to genuine international solidarity. ■

Gaston THORN, Head of Government and Foreign Minister of Luxembourg

"The Community owes itself not to allow the spirit of cooperation with the Third World to decay"

Luxembourg is the smallest member of the European Economic Community, but its location in the very centre of Europe, and related political factors, give it a more significant part to play as a catalyst and a moderating influence than its size and economic status would suggest. When the second Yaoundé Convention was under negotiation, the action of Luxembourg had a decisive influence. With the Europe-A.C.P. agreement now coming closer to reality, Mr. Gaston Thorn, the Luxembourg Head of Government and Foreign Minister, has told us his ideas about the special part his country can play as a member of the Nine-nation Community, and his assessment of the Europe-A.C.P. agreement itself and the responsibilities of Europe towards the Third World.

Mr. Thorn is one of the youngest heads of government in the world and one of the leading european personalities with whom cordial and immediate contact can most easily be made. He has been head of the Grand Ducal government since June 1974; and in addition to the offices of Prime Minister, and Foreign Minister, he is Minister of Physical Education and Sport. Academically he is a Doctor of Law; and he first entered the Luxembourg Parliament in 1959. Since 1970 he has been President of the Liberal International.

Théo Mey — Luxembourg

▶ *Besides being Premier Mr. Thorn, you are also Minister for Foreign Affairs and so in charge of cooperation; and it is in this capacity that I have the privilege of talking to you. For a long time you have been very conversant with cooperation problems, and for some years you used to be Chairman of the European Parliament's Standing Committee dealing with these matters. Could you describe in a few words the established position of Luxembourg in this field?*

Luxembourg never had any responsibility of its own under colonial history and it has never made its efforts on behalf of the Third World conditional on a commercial counterpart. It is therefore free to decide upon its policy without any complex or heritage from the past, and without any ulterior motive. From the very first the Luxembourg government has been a keen supporter of close and confident cooperation with the Third World as a whole and primarily with those countries with which our historical and geographical links are closest. I myself, when I was a young member of the European Parliament, and later when I was a member of the E.E.C. Council of Ministers, supported every effort towards the accomplishment of the great scheme of the Eurafrican Association. As we saw it, this association was bound to gather increasing substance as its experience developed, and to bring more and more advantage to both sides.

In practice it was on these lines that things developed; and after Yaoundé I

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and Yaoundé II, the negotiations now in progress will mark a new stage in the broader and deeper association between Africa and Europe. Quite apart from this special standpoint, the Community cannot avoid concerning itself about the destiny of the other countries of the Third World at a time when the simultaneous rise in prices for raw materials, food products and industrial goods are leading these countries into dramatic and even catastrophic situations.

▶ *At a press conference in September, Claude Cheysson, who is responsible for development and cooperation in the E.E.C. Commission, summarised what the European Community has done about cooperation. This, he claimed, is a field in which Europe has successfully defined the objectives, initiated action and played the part of a prime mover in the struggle to help those countries which are disinherited. Europe's policy of cooperation can thus be regarded as a factor of unity for Nine-nation Europe and as a positive point in the building of Europe, to which Luxembourg has always been so strongly attached. Is this your view?*

In my view it is much to the credit of Mr. Claude Cheysson that he has given the E.E.C. cooperation and development policy a new dimension and a new impetus. The dimension is new because the modulus for the policy will in future be the difference between the situations prevailing in the various regions of the Third World, following the upheavals in economic backgrounds in recent months. The impetus is new, because of the increase in the number of countries eligible for Community action and the intensified effort which the Community is to make.

It goes without saying that these measures will undoubtedly be an important element in the process of european integration. It stands to reason that a Europe which is aware of the poverty of the Third World, and determined to contribute to the limit of its possibilities in providing a remedy, will enjoy a status which can but reinforce its determination to stand together in the pursuit of such a policy. It is encouraging to note that the Commission's proposal to set up an emergency fund for the least favoured nations secured unanimous support among the Nine governments; and that throughout the sixth special session of the UN General Assembly dealing with raw materials and development, the Community was able to speak with a single voice and was the leader among the industrial countries anxious to put their relations with the Third World into a new framework.

All the same, we should not overestimate the positive effect which our development policy has on the image of Community activities as a whole. It is only a reality so long as we make it identifiable. By this I mean that in future, whenever we take direct action in favour of developing countries, and whenever this action is proved to be as effective as that of the many multilateral organisations catering for the needs of the poorer nations, we should call attention to it. In this way we could counter the unduly frequent accusations of mercantile egoism.

▶ *Luxembourg, small though it is, clearly plays a part in Europe far greater than could be accounted for by its area, the size of its population or its economic strength. I have seen this for myself at least once. This was when it played such a major part, when you yourself were President of the Council of Ministers of the Six-nation Community, and the 2nd Yaoundé Convention was being negotiated. The fourth ministerial meeting was held in the Kirchberg building in your own capital, and the fundamental points had so far eluded settlement. The spokesman for the A.A.S.M. was the Minister Conan Bédié; and it was you who took him aside for several hours discussion, and came back to the meeting with a package deal which resulted during the night in the new Convention being settled and initialled. Was it not in fact the case, that your work as negotiator was made the easier by the fact that you represented a very small country, which gave you added authority as spokesman for the interests of everybody concerned?*

It is certainly true that Luxembourg plays a more important part than the size of the country and its economic status would suggest. This is largely because Luxembourg's diplomatic activity, more especially in european economic organisations, is not exclusively angled on defending the country's own interests which, in the nature of things, are far less numerous than those of the other partners. This special circumstance enables the Luxembourg representatives to take a much more neutral view of the problems, and to seek solutions on a less partisan basis.

I hasten to add that this does not mean we pretend to any monopoly of wisdom. It results rather from the good relations Luxembourg maintains with all its partners, so that the voice of the Grand Duchy is listened to and respected. I think the example you have quoted is an illustration of these special circumstances which, nevertheless, apply only when the native genius of a small country is given free rein and not submerged in the corporate anonymity which might result from excessive efforts at integrationism.

▶ *It happens of course in any negotiation, that a point is reached when the experts can get no further and the unblocking of the discussions depends on compromise solutions being found by those in charge on the political side. This presupposes a common political will to reach solutions. Has it not often happened that other parties have fallen in with the action taken or suggestions made by Luxembourg, so that the Grand Duchy has played the part of a catalyst in bringing the political will into the forefront of discussion?*

This question follows from the last one. The answer is that Luxembourg lies in the heart of Europe and has close economic ties with many countries, so that it has throughout its history been able to play the part of a catalyst. It has been directly submitted to the dire effects of action by its powerful neighbours; and, armed with the experience it has gained with its Benelux partners, it can reasonably claim to have an objective view of the matters laid on the negotiating table. It is thus the easier for Luxembourg to think up a compromise solution which will be acceptable to everybody. Even

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this, however, is becoming an increasingly arduous task, because our Community partners—and even our Benelux partners—so often adopt rigid and unchanging attitudes which leave little room for manoeuvre. Moreover, all attempts at compromise are illusory if the other capitals are lacking in the political will which must underlie them.

▶ *It is just this political will which the Kingston Conference brought to the surface, both on the Community and on the A.C.P. side. It has been said of the new agreement with the A.C.P. that it marks the beginning of a new type of relationship between industrial and non-industrial countries. Do you agree?*

I accept your evaluation of the Kingston results, in that the Conference brought together 44 countries from Africa, the Caribbean and the Pacific on one side of the table and nine European countries on the other, and they sketched out together the outline of an entirely new type of convention. The Community has indeed done an original job in the field of relations between industrial countries and developing countries. It has done this by giving improved access to the Community market to a greater number of products from the A.C.P.; by devising machinery for stabilising the export receipts to these countries for some of their basic products; by setting on foot systems of industrial cooperation marked by the transfer of technology and knowhow; by establishing the principle that future agreements shall be very largely under joint management; and by giving reality to the prospect of increased financial cooperation. It is to be hoped that the Kingston impetus will not be allowed to run down, and that the negotiation will come to a quick and successful conclusion within the next few weeks.

▶ *The European Community is now the biggest importer of any trading area in the world. The countries associated with it need a Europe which is united, powerful and prosperous, carrying such weight as will make its voice heard in the counsels of the world. Now as things stand, the world is passing through a phase which seems likely to be difficult for some time to come, and the building of Europe seems to be hanging fire. On the eve of the forthcoming Summit Conference, are you still reasonably optimistic?*

Tony Krier — Luxembourg

Gaston Thorn

"... An open-minded policy free of the influence of the past."

World conditions today are specially difficult, and there is a growing danger that the reflex of nationalism may gain the upper hand. This is a time when the Community owes itself not to let the spirit of cooperation with the Third World decay. Now that the different organisations of the United Nations are working on a new charter setting out the economic rights and duties of individual States, there is one matter to which I give special priority. I am thinking of the state of mind which will allow policies to be defined and solutions sought in the only way possible, which means in the absence of all constraint or pressure of whatever kind and from whatever source. To this end the Community has an important part to play; and it can only do so if its internal cohesion is under no threat but growing stronger every day. I am not by nature a pessimist, but the forthcoming Summit meeting can only be successful if it is adequately prepared. We are engaged on this at the present moment, but with the meeting only three weeks ahead (1) I am sorry to say the differences of view still run deep. My hope is that my colleagues and I will be able to find the political impulse which is indispensable if solutions are to be found and definite attitudes defined, as is so urgently necessary in the difficult circumstances of the moment. ■

Interview by
Alain LACROIX

(1) This interview took place on November 19, 1974.

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Development aid: "fresco of Community action, tomorrow"

At the suggestion of the Council, the Commission has compiled a paper on the problems arising in development countries and its ideas about how they should be tackled in the longer term.

This amounts essentially to determining the lines of Community action, internal and external, in the light of current negotiations with the Third World and the current crisis, with special reference to raw materials. M. Claude Cheysson, Member of the Commission responsible for development and cooperation policy, has made this note available to the press.

The fundamental choices

The underlying philosophy of the Commission approach can be summarised in a single phrase—"to each according to his needs by bringing all our means to bear". The first task is accordingly to determine what are the needs of these countries, and then to bring the appropriate means into play.

The needs

At the end of the colonial period it was customary to think of the Third World as a single entity. In practice, an examination of the requirements of the different countries brings out the fact that they differ in kind as well as in degree, and it is now in the light of these differences that they should be considered. The Commission is not the first organisation to take this line; but it is important to begin at the beginning.

An examination of these differences shows the existence of three fundamental situations:

— the situation of the poorest countries where the primary target is survival. A thousand million people are in this situation;

— the situation of countries which have already reached some degree of development, but need aid to attain their maximum prosperity;

— between the two is the situation of a number of countries which possess resources and can reasonably hope to reach some degree of development (e.g. by expanding their exports).

These three situations are totally different.

Further classification. An attempt at further classification of the states of underdevelopment leads to the countries being sorted into categories defined by their:

— level of development,

— population,

— export capacity.

Selective cooperation policy. The original feature in the Commission approach is that the analysis is not limited to financial aid, which is regarded as the least "useful" of the forms in which aid can be given. The diversity of requirements calls for a diversity in the lines of action. The most "useful" aid is of an economic and social character.

The form of the aid has to be adapted to the requirements of the country concerned. In broad terms the division is as follows:

— for the poorest of the countries, recourse must be mainly to finance aid and food aid, supplemented by technical assistance;

— for the wealthier countries at the top of the scale, the main approach is through industrial cooperation. This does not exclude trade cooperation, the ultimate aim being real economic integration from the producer to the market;

— for the third, or intermediate group, in which the resources still need to be developed, the action should be directed mainly to the stabilisation of export receipts, access to markets and trade promotion.

The means to be used

Associations. Among the various possible frameworks for a policy of development aid, the association formula is very conducive to progress in the developing countries. It contains all the elements needed for promoting their adaptation, and the agreements are durable, irrevocable and stable. They are a fundamental aspect of the policy of development cooperation.

Finance cooperation and food aid. Food aid is the primary instrument for helping the poorest countries, and the amount of it ought to be increased. It is a matter for regret that the increase proposed by the Commission, and its organisation under a pluriannual programme, was not adopted in practice. At present we are still at the stage of maintaining the previous appropriation.

The finance aid already provided for associated countries could in future be supplemented by finance cooperation for the benefit of non-associated countries.

This aid, however, should be increasingly reserved for the poorest of the countries. Under this heading the Community is at present contributing to the United Nations emergency campaign.

M. Cheysson takes the view that public development aid should be materially increased. In practice it is continously decreasing and now amounts to less than 0.3 % of the G.N.P. of the donor countries. Contributions should also be organised from the wealthier countries of the Third World for the benefit of the poorer countries.

Trade cooperation. Among the principal instruments of commercial policy used by the Community, the system of generalised preferences is an important contribution, even though there is still progress to be made in securing a better distribution of the advantages among the beneficiary countries.

As regards the stabilisation of export receipts, it is not possible to envisage a Community commitment going beyond what was agreed in the ministerial conference at Kingston. Further action must necessarily be on a world basis.

The position of Europe. Europe appears particularly well placed for action in this context. It appreciates the

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need for diversifying the lines of approach and its knowledge of the Third World is intimate. It is a net importer of raw materials; and the very serious crisis currently affecting its balance of payments is an inducement to seek new export markets.

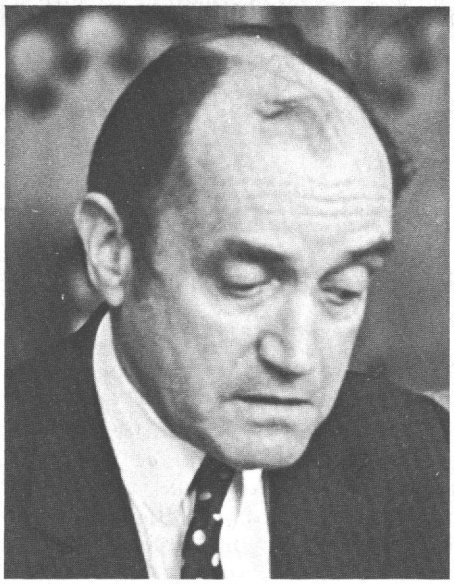
Between 60 and 70 % of these potential markets are in the countries of the Third World.

The Commission lays down the main guidelines of its future action in the first part of the paper, resuming them as follows: "To each according to his needs, by bringing all our means to bear". Below is the section relevant to the Associations and the preferential cooperation agreements.

"It is relatively easy to apply these principles within the most complete system the Community has set up to contribute to development.

Whether cooperation is organized within a collective framework—today with the Yaoundé countries, tomorrow with the A.C.P., or on an individual basis, with each of the countries included in the "overall approach towards the Mediterranean"—the intention is always to employ the different means of action which have been described above jointly and on an overall basis; this is a golden rule of the Association. Moreover, our Associates and ourselves sit round the same table; in this club, priorities and programmes are set by our Associates and not by ourselves; mutual aid is *de rigueur:* consultations and meetings, whether institutionalized or not, must be frequent; not only the executive bodies, but also the driving forces behind public opinion and the economy, members of parliament, manufacturers, businessmen and trade unionists must get together, get to know each other and exchange views. In this fashion it should be relatively easy to appreciate the real needs and, consequently, to adjust our means within the limits of our possibilities.

Two other factors will contribute to this necessary adaptation within our associations: there are 44 A.C.P. States, and there will shortly be 47; they represent Black Africa; they are justly proud of the fact and truly confident, and this ensures a certain equality in the dialogue between them and ourselves.



Claude Cheysson

And, since the expression is being used, it must be noted that there is also the impression of a relative equality between Israel and the Community and between the Arab countries and the Community, but for other reasons previously stated.

The Associations, moreover, are the result of contractual Acts.

Once the conventions are signed, our Associates are assured of Community aid in all its forms: we have the right neither to revoke nor to modify our undertakings for the duration of the contract; this is a valuable stabilizing factor for development.

Since the very philosophy of Association includes the requirement to adjust to needs, we should not be surprised to perceive that such adjustment is taking shape during the present negotiations wherever there is a need for it.

At the level of trade cooperation, there is no call for fresh comment on the methods of action used in the past. They will be improved in various respects (rules of origin, agricultural products) for all the Associates, and their field of application will be broadened for the Mediterranean countries.

The introduction of the principle agreed in July at Kingston for the stabilization of export earnings in money terms constitutes a very important innovation. It may be compared to recognition of the right to unemployment and sickness benefit for workers in our countries. Of course, it does not constitute index-linking, the sliding scale requested by the Third World, but it is an important step towards a new economic order. And as regards one product, sugar, the Commission recommends going further by more or less linking the price guaranteed to A.C.P. producers to that paid to the Community producers, which would introduce a relation with the effects of inflation clearly taken into account in some fashion when European agricultural prices are fixed. In the case of sugar, guaranteed supplies and outlets go hand-in-hand, thus completing the system.

The stress laid on industrial cooperation is new. Naturally enough, at Kingston, our Associates asked us to give it an important place, which was accepted. Interest in it is even greater in the Arab countries and in Israel. It is no exaggeration to say that, as far as the most developed of them are concerned, it is the main issue, the only one which really counts in cooperation with the Community and the European countries. It is also an aim of prime importance in the Euro-Arab dialogue. We shall therefore have to use a lot of imagination, of flexibility, whether we are dealing with investment guarantees, systematic organization of meetings between the circles concerned, or support of our operators in these ventures. This is a consequence of our desire to adapt our aid to the specific needs of our partners.

The new guidelines are therefore being drafted in the current or imminent negotiations. In one field, however, there will have to be difficult decisions in the coming months, that of financial aid. The Community has already decided to increase appreciably the volume of grants and loans placed at the disposal of our A.C.P. and Maghreb Associates. But, in the A.C.P. club, the conclusion will also have to be drawn from the remarks made previously on the shifting of financial aid—more especially grants and concessional aid—from the countries which are now better-off to the poorest countries, the worst hit by the crisis. Thus the poorest countries—unfortunately the A.C.P. group contains many—will benefit not only from the upgrading in money terms agreed by the Council, but, additionally, from some transfer of Community aid previously allotted to less deprived countries". ■

PORT-LOUIS:

Joint Committee of the Association Parliamentary Conference

PORT-LOUIS (Mauritius) — The Joint Committee of the parliamentary Conference of the association between Europe and the A.A.S.M. met at Port-Louis in October, 1974 under the chairmanship of Mr. Kasongo Mukundji (Zaïre). At the opening meeting an inaugural speech was made by Sir Seewoosagur Ramgolam, Prime Minister of Mauritius. The new agreement now under negotiation in Brussels, he said, could be the "cement of union" between the European Community and the A.A.S.M.

The dais at the Joint Committee meeting at Port Louis. The Chairman is Mr. Kasongo Mukundji, the Vice-Chairman Mr. Pierre Deschamps.

The Nine-nation European Community, said the Mauritius Prime Minister, has "recognised its responsibility to the countries of Africa, the Caribbean and the Pacific", but we have now reached the state of "translating into acts the good intentions which have been expressed". Speaking of markets for raw materials, he stated his view that the countries producing bauxite and copper had taken legitimate action in following the oil producers in their decision to be masters of their own natural resources. He asked, in particular, for more flexible legislation about exports, and for some modification of the E.E.C. countries' joint agriculture policy to take account of the obstacles to the export of products into the Community markets.

On the sugar problem, Sir Seewoosagur said he favoured "seeking a guarantee

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for a stated quantity of sugar at freely negotiated prices for an indefinite period".

In the discussion which followed, Mr. Pierre Deschamps, Deputy Chairman of the conference (Belgium; Chr-Dem.) called for a close analysis of world economic development and the setting up of a system for stabilising import receipts and satisfying the needs both of exporters and of importers. He also called for the operations of the European Development Fund to be brought up-to-date.

The speech of Mr. Alioune Sissoko, Ambassador and Head of the Mali Mission to the European Communities in Brussels, was concerned with european aid in general, both in its quantitative and its qualitative aspect, and especially with the amount of the next European Development Fund and with the Cheysson plan.

"The effort the E.E.C. is making, even though it be insufficient, is at least praiseworthy. There are indeed other powers which are wealthier than the Community; but with some of them we do not even enter into discussions because their aid lacks the positive quality we find in the aid from Europe. As for the other countries with which we cooperate, it has to be recognised that, though their aid may be bigger than that of the E.E.C., we are often faced with bitterness and disappointment. The aid you give us may perhaps be insufficient in quantity, **but in quality it is far ahead of the rest.** For this reason we take no offence when you remind us that you have done a good deal, and that we ought to take this into consideration and allow for your present difficulties. It is indeed true that you have the greater oil requirements, but what do you think of our difficulties in securing our energy supplies? What is your view of the extra burdens falling upon us, because of rises in world prices from which we are suffering much more severely than you are? We are, nevertheless, taking your problems into account; and in the special case of oil, let me tell you that there is much prospecting in progress in our countries, and the day may well come when we shall be able to discuss this with you as between friends. This should be some solace to you, and an indication that our association goes beyond mere sympathy and may lead to a balanced sharing of profits..."

On the question of **the amount of the next European Development Fund,** Mr. Sissoko's remarks were in substance as follows: "We have been asked how much we need; and we have replied honestly and frankly. If Europe finds the amount excessive, she has only to amend the invoice and put in the sum which suits her. It is not for us to say our needs are smaller than they are. If you were to stop short at a rule of thumb adjustment of the present E.D.F., raising it in simple proportion to the 180 m people in the future association, compared with the 60 m people covered by the present Fund, you would not have made any progress. You would have changed nothing; and you would indeed be offering less than you are now giving, because you would not have allowed for the deterioration in our terms of trade and taken to yourselves the benefit of the fall in the purchasing power of money. In fact you would not have brought the E.D.F. up-to-date".

The Mali representative went on to discuss the **Cheysson plan.** "We are well aware", he said "of the prodigal efforts the E.E.C. is making to aid the whole of a Third World so stricken by the oil crisis and the flare-up in world prices. It has invited other countries to join with it; and though the affirmative answers have been but few, it is still persevering. Much the same story can be told about the generalised preferences, in relation to which we ourselves were distrustful, and rightly so. The Community took its own action on this, though it was not successful in persuading the super-powers to rally round. Those who did not follow the Community's lead were not the poor countries, but simply those which had not the will to act. This demonstrates the moral, social and international attitude of Europe. The day will come when we shall all of us be answerable to the public opinion and the judgement of history; and our Association will have to justify itself in the eyes of coming generations. When this time comes, our joint achievements will weigh heavily in the balance against those other States which have lacked the will to corresponding action". ■

FINAL DECLARATION

The Joint Committee adopted a final resolution expressing the opinion that:

• the amount of the future European Development Fund—which is standing evidence of the full solidarity of the Community with the Associated countries, irrespective of the difficulties through which the Community is passing at the present time—should provide the A.A.S.M. with the same advantages at current prices as they now enjoy; and the criteria for the determination of equivalent treatment for the new Associated States, should include:

— the increase in the population affected in virtue of the new A.C.P. Associates;

— the effective purchasing power of the aid;

— the real economic and social development requirements of these countries;

• and emphasising the importance of the E.D.F. being operated on a joint basis.

It invites the Association Council to make forthwith the decisions necessary for the operation of transitional measures, to ensure the continuity of the existing Association in respect of trade, financial and technical cooperation and the institutions of Association, pending the entry into force of the new Convention, and asks the E.E.C. Commission to propose as a matter of urgency the adoption of special measures to enable certain provisions of the new Convention to be brought into application in advance.

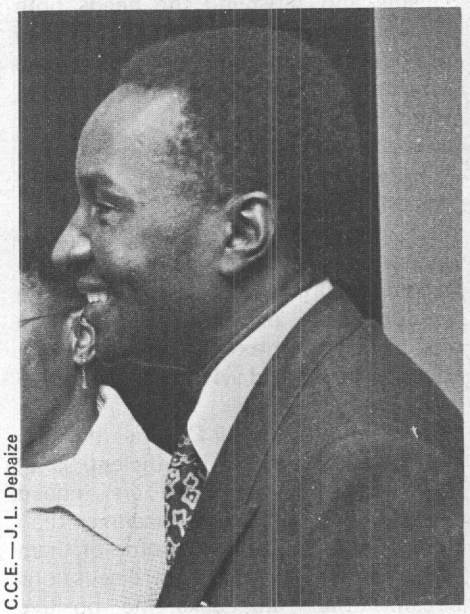
In regard to the African nations, which have recovered, or are about to recover their political independence in respect of Portugal, the Joint Committee desires that the Association be held open to the possible adhesion of Guinea-Bissau before signature of the forthcoming agreement, and that a simplified procedure be made available for adhesion after such signature of the other States which have not as yet attained their full international sovereignty. A similar simplified procedure should be open, also, to Namibia. ■

Seydina Oumar SY, Ambassador of Senegal:

The Europe-A.C.P. Agreement: "a model for a new international economic order"

Senegal is one of the most attentively regarded African countries in international circles. The ideas of the President, Mr. Léopold Sédar Senghor, have unquestionably played a major part in working out the new cooperation Convention between Europe and the A.C.P.

Senegal was particularly hard-hit by the disastrous drought which has done so much damage to six Sahel countries during the last five years. Its economic activity has now been resumed and the economic prospects seem better. With the new agreement between Europe and the A.C.P. now almost ready, Mr. Seydina Oumar SY, Ambassador of Senegal in Brussels and head of the country's mission to the European Communities, describes the food situation in his country, and talks of the importance of the forthcoming agreement for Senegal's economic and social progress.



C.C.E. — J. L. Debaize

Seydina O. Sy

▶ *The drought in the Sahel has unfortunately moved into second place among international topics. Catastrophe nevertheless still lies at the door. What is the present food situation in Senegal, which was one of the countries most affected by this long drought?*

To the best of my information, the food situation in Senegal is good. It must be stated, nevertheless, that the region is on a knife-edge balance. So far as Senegal itself is concerned, the help we received and the organisation brought into being by the Senegalese government enabled the gifts which came to hand to be distributed in good time to the most remote parts of our territory, so that up to the present we have not yet had to deplore any instance of real famine.

▶ *You mentioned the regular distribution of the aid received. Two years ago, and last year again, it was said that the help was held up in the port of Dakar through lack of material and organisation for its distribution to the most remote and worst affected regions. Was this true?*

If you are talking about the distribution of the aid received by Senegal inside Senegalese territory, the answer is no—there were no problems and no complaints. According to the information which has reached us here, the aid earmarked for Senegal and coming into Senegalese territory was distributed in good time—and I'd almost say in record time—from the port of Dakar to the most remote corners of the country. The complaints you raise refer to the distribution of aid sent into Dakar and earmarked for other countries, such as, for example, Mali. In these cases it was transport rather than organisation which was lacking. The railway rolling stock was old and there was not enough of it, so that there was certainly some delay in the transport and distribution of the aid to Mali and other countries. At one time it was reported that the aid had been piling up in the port of Dakar, and it was even said that some of it had perished or been lost because it had not been sent out quickly enough. All this was because of the lack of transport material and not through any fault in the organisation. Strictly speaking, it can be said that there was some lack of coordination between the machinery set up by the different countries affected by the disaster as, for example, between what had been done by Senegal and by Mali. For sending out the supplies to Mali there was nothing but the express train and the goods train, and even this shortage was accentuated by the obsolescent condition of the rolling stock.

▶ *The A.C.P. countries (Africa, the Caribbean and the Pacific) are negotiating a cooperation agreement with Nine-nation Europe. Mr. Seydou Djim Sylla, the executive Secretary of the A.C.P. negotiating group, considers that the new agreement will leave no aspect of development cooperation uncovered, and that it "will be more complete than any existing agreement". What do you think about this?*

Yes, I also believe the agreement we are now negotiating will be more complete than all agreements so far. It does indeed lay down a pattern for a new international order in the relationships between developed and developing countries. I am entirely in agreement with the opinion expressed by Mr. Djim Sylla.

▶ *What have been the main difficulties in this negotiation?*

Unfortunately all the difficulties have not yet been overcome, and some of

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them are still there. Among them is the problem of the stabilisation of export receipts, which is a new undertaking, both for the Europeans and for ourselves, and contains a number of complexities. A number of other questions are still unsettled, including the increased participation of the A.C.P. countries in decision-making. In all these matters we are busily searching for the right formula. The discussions have not been brought to an end, and we do not despair of finding satisfactory arrangements. In any case it must be borne in mind that the major difficulties were smoothed out at the Kingston Conference. If there were important obstacles they have been cleared away. I do not mean there are no more obstacles and that Kingston solved everything, but Kingston was an occasion for both the Europeans and the A.C.P. to reaffirm their common will to overcome whatever obstacles may arise in the course of the negotiations. For the moment these consist largely of the E.E.C. Agriculture Policy and the stabilisation of A.C.P. export receipts which I mentioned just now, and there is also the question of settling the rules of origin for A.C.P. goods entering the european market. These are difficulties which I am sure can be overcome so long as there is goodwill on both sides.

▶ *What are Senegal's special expectations in the new Europe-A.C.P. agreements?*

A contribution towards a more just and more equitable world, by setting up a new international economic order with its roots in a fairer trade policy. This is what we particularly aspire to see in the new Europe-A.C.P. agreements.

▶ *As regards future development, what are the fields of special interest to Senegal?*

The future development of Senegal is concerned in the forthcoming agreement because of the financial and technical cooperation aspects. The European Development Fund has of course contributed a great deal, and I hope it will in the future contribute still more to the execution of important projects for senegalese development and for the expansion of senegalese trade. If the deterioration in the terms of our trade is successfully brought to an end by the trade clauses in the agreement, combined with the system of export receipts stabilisation, this will indeed be a contribution to the development of Senegal.

Senegalese industrial policy, too, will be furthered by the new Convention, which will assuredly have a special section on industrialisation. It is also of special interest to Senegal that the accent is to be put on regional development, for the country is doing all it can in its own sub-region to promote projects which depend on solidarity between different interests.

▶ *On the subject of regional policy, how does the Economic Community of West Africa stand at present? What is the Senegalese government going to do to restimulate this regional cooperation, especially between countries bordering on the Senegal river?*

There is no question of restimulating this regional cooperation. It is not stagnating. It has already come into action and is developing satisfactorily. Senegal, through its presidency of the O.M.V.S. (Development Organisation for the Senegalese Valley) means to continue and accentuate the initial impulse given under President Moktar Ould Daddah, and see that the projects adopted by the Council of Ministers find the necessary finance. The West African Economic Community still continues. It is, I believe, still in the process of being set up, and I have every hope that it will accomplish useful work.

▶ *In the Senegal Valley development scheme, there is a proposal to build a dam and a hydro-electric complex at Manantali. How important will this dam be to the supply of electric power in this region? Will it cover the potential demand for power for all the countries in this region?*

I think I should remind you that the organisation of the River States no longer exists, and has been replaced by the O.M.V.S. The Manantali dam is indeed a project of some importance to us. Its location will be in Mali which, however, will not be the only country concerned. There will in fact be another dam at Manantali, to be built in the delta and therefore in Senegal. This will retain considerable quantities of water, and will serve both for electric power production and for regularising the flow of the river. It will thus provide farmers with much more irrigated land than at present. This makes the project very important, and the first step at Manantali will have to be the delta dam. At a later stage the Gouina dam may also be built, and perhaps others will follow. These are all parts of a single integrated project, calling for a total investment of over F-CFA 200 000 m.

▶ *One more question, Mr. Sy: to refer to a recent statement by President Senghor, that solutions to many crises of the present time are to be sought in cooperation and not in confrontation. This is true enough; but he added that it is in the Eurafrica framework that these solutions should be sought. Do you take a confident view of the Eurafrica concept?*

Yes. We Senegalese pin our faith on Eurafrica because it is an undertaking which relies primarily on the facts of history to trace out the paths of the future. This future lies in cooperation between developed and developing countries. The need for Eurafrica, we believe, lies also in the fact that the Europeans lack raw materials and we have them, while we lack advanced technology and the Europeans have it. Rather than embark upon economic warfare which would be a disaster for everybody, would it not be better for us to pool our resources and unite our efforts to secure growth in the european economies and development in those of countries which are still backward? This is precisely what President Senghor meant. Confrontation will do no good to anybody; and in a confrontation between the strong and the weak it is always the weak who go to the wall. As things stand it is we who are the weak; and among the countries producing raw materials, the oil-producing States are in a position of strength. It has to be recognised that all countries do not have reserves of oil; and that in any case it is to the interest even of the oil producers to seek systems of cooperation rather than confrontation with the countries which are not producers. ■ Interview by

Lucien PAGNI

The Pacific A.C.P. States

The Pacific A.C.P. States, Fiji, Western Samoa and Tonga, are probably less well-known to our readers than Africa and the Caribbean because of their geographical position and relatively small size. Association News now meets four representatives of the Pacific negotiating in Brussels: Mr. B.R. Davidson of the South Pacific Bureau for Economic Development, Co-ordinator of the Pacific Secretariat; Mr. Michael McGeever, Fiji Chargé d'Affaires; Mr. Iulai Toma, Assistant Secretary to the Western Samoa Government; and Mr. E.H. Jones, Chief Agricultural Economist to the Fiji Government.

▶ *Mr. Davidson, as coordinator of the Pacific Secretariat, perhaps I can you ask first: how did the Pacific territories get involved in the A.C.P. negotiations in the first place?*

Davidson. — Well, as associable countries under Protocol 22 to the Act of Accession.

▶ *Was there any discussion in the Pacific beforehand as to whether this affected you in the first place? Because you do have rather more links with New Zealand and Australia and Canada than with Europe.*

Davidson. — I don't know if there were initial discussions amongst the Three, whether they would in fact take up the offer of negotiating...

R. Heiderscheid

M. McGeever

McGeever. — The fact that they are being offered association, as you say, arises directly out of Protocol 22. We were Fiji, Western Samoa and Tonga, the three independent Commonwealth countries of the Pacific which had special relations with Britain in the spheres of trade and aid and for whom Britain felt that some special substitute arrangements would have to be made as a result of joining the European Community. The trade—although you say that our links with Australia, New Zealand and Canada are important, this they certainly are for geographical reasons—the trade element of our relations with Britain is one which is certainly not to be sniffed at, small perhaps in quantitative terms, in qualitative terms, for our countries, it was certainly very important and continues to be very important. Fiji sugar—the great proportion of Fiji sugar—and the copra and coconut oil of Western Samoa and Tonga and Fiji and the cocoa of Western Samoa all find their principal markets either in Britain or in the Europe of the Nine.

▶ *Do you think the future Convention means the same to you as it means to the Africans and the Caribbean? What is the importance of it to the Pacific?*

Davidson. — Well, in relative terms it is important both in trading and in aid terms. In trade terms, as Mr. McGeever said, the major export commodities of each of the three countries are directed towards Europe.

Toma. — Yes, in terms of trade it is very important to us; but the significance of an association with Europe is slightly different in our case to the case of Africa, because naturally, due to their geographical situation, they find it rather more natural to have an all-embracing kind of association with Europe; a comprehensive relationship with Europe. In our case we are a long way from Europe and although we consider it vital to have a firm relationship with Europe, for trade reasons especially, we would not feel it so natural to have as full a relationship as the Africans might have with Europe.

▶ *So for the Pacific States the trade aspect of the future Convention is probably the most important, as opposed to the institutional or financial or the aid aspects?*

Jones. — I am not sure that I necessarily agree with that. Trade certainly is important because, as Mr. McGeever said, a lot of our exports are directed towards Europe; Fiji, 140 000 tons of sugar; copra for Tonga, Western Samoa; coconut oil for ourselves. And after all, we shall be losing Commonwealth preference with Britain, as from early

FIJI, SAMOA, TONGA

The Pacific A.C.P. States, Fiji, Western Samoa and Tonga, straddle the Date Line some 3 000 km from Australia. They include more than 1 000 islands, of which only a handful are of any real size, and have a total population of less than 750 000 inhabitants. Their geographical isolation, while helping to preserve their traditions, poses special development problems.

Fiji and Tonga became independent of the United Kingdom in 1970 and Western Samoa of New Zealand in 1962. These links still account for the main sources of aid, by a small margin. The islands' economy is agricultural and largely dependent on coconut products, with the important exceptions of sugar from Fiji and cocoa and wood from Samoa. Fiji has a considerable industrial development and important tertiary sector. Agricultural techniques generally are relatively advanced.

The population is mainly of Polynesian and Melanesian origin, with the exception of Fiji where 51 % is of Indian origin. There are European and Chinese minorities.

The islands have connections with a number of international aid organisations and the Fiji capital, Suva, is the headquarters of the South Pacific Bureau for Economic Development (Australia, New Zealand, Cook Islands, Fiji, Nauru, Tonga, Western Samoa, Papua, New Guinea), founded in 1972 under the auspices of the South Pacific Conference to develop co-operation in the area. Regional co-operation remains one of the islands' main concerns.

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next year, and if we do not associate then we will be third countries and, although association will put us in as advantageous position as we have been in, we should be in a worse position if we did not associate.

▶ *Are there any special aspects of the negotiations which only concern the Pacific States, or have you gone along with the A.C.P. in general as a bloc?*

Toma. — We have gone along with the A.C.P. Group as a total group. I don't think any aspect of the negotiations has arisen that is of peculiar interest to us. So far, what has been of interest to the A.C.P. Group as a whole has also been of interest to us.

▶ *Because it could perhaps seem strange that a group such as the Caribbean, which has a much more 20th century financial and economic structure than, on the whole, the Pacific States have, can negotiate side by side with you. Does this not pose any problems?*

McGeever. — Not really. I think I'd agree entirely with Iulai Toma that there has been no single issue where the interests of the Pacific have varied or diverged in any material respect from those of the African and Caribbean participants in these negotiations. This has been the striking feature of the negotiations. Obviously there have been differences of degree, things which are intensely important to certain of the African or Caribbean States do not have quite the same degree of importance for us, but the principle remains the same—the emphasis may be different only. On the question of aid, for example, which I repeat is an important element to us in these negotiations, particularly as Europe has expressed a special interest in wanting to encourage regional co-operation, inter-regional cooperation; one of our great problems, due to our geographical situation, is the need to forge regional and inter-regional relationships which will be to the advantage of all the countries that are in our area. But on this question of aid, the A.C.P. I believe, as a principle, would support the untying of aid, for instance. As a principle it has its importance, but in practical terms perhaps for certain of the A.C.P. countries the effects of tied aid from Europe are not so keen, whereas to the Pacific with the question of distances involved and delays in time and cost of freight, the question is not really one of principle but it assumes a certain practical importance—and so there are all these differences of degree. But as regards any differences of substance, I don't think there will have been any in the whole course of the negotiations since last July.

Jones. — Of course there's the question of coconut products, which is of particular interest and probably only of interest really to the Pacific, but this has been built into the general scheme of export receipt stabilisation and has been accepted as such by the rest of the A.C.P. Group.

▶ *To what extent does the Pacific economy depend on coconut products, and in particular copra?*

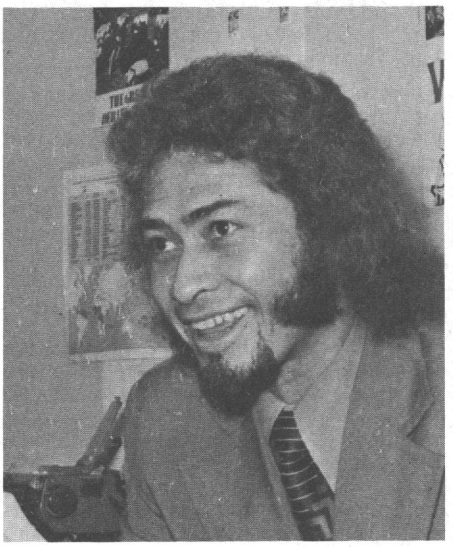
Jones. — Fiji to a much lesser extent than Tonga and Western Samoa, where it is of very great importance. But even in Fiji, where, say, 10% of our export earnings come from coconut products, it is of vital importance to a very important section of our population as virtually their only means of obtaining cash.

▶ *Perhaps I could take this opportunity to ask you respectively to describe not only the economic structure but also the social structure of the Pacific Territories. Some commentators have suggested that various aspects of the Pacific are still some two or three hundred years behind the rest of the world. This seems a very good idea if you believe the travel agencies who say the South Sea Islands are still a paradise, but I can't believe that's entirely true. Mr. Toma, perhaps I could start with you for Samoa?*

Toma. — Well... The commentator you referred to obviously thinks that something two hundred years old means lack of progress. He may be saying in fact that we are primitive. No, it's difficult to describe our social set-up. It is very much a set-up that belongs to us; the Samoan social system has remained fairly much intact over the years despite the long contact with the Western world. Now it is politically itself an independent State with structures modelled on the Westminster example, and this has been made fit in with the indigenous social structure. I cannot hope to explain it in a few minutes, much less to an audience from the opposite side of the world. It's a very complicated set-up.

▶ *I would nonetheless ask you to present, if possible, a brief sketch of the Pacific territories to African and Caribbean readers and perhaps to talk more particularly about the risks of changing violently this traditional social structure by opening the States to Europe particularly, and to the outside world in general. Is this going to involve a lot of problems?*

McGeever. — I don't think there is any suggestion that what is going on here is in any sense going to open up the Pacific territories to the outside



R. Heiderscheid

I. Toma

world or to the influence of Europe. This is something which has been going on for a long time and we are far from being un-opened up. We have a very flourishing tourist industry, for instance, which involves the local population in all three territories, I think it's true to say—possibly more in Fiji because of its central position than Tonga and Western Samoa—it involves the local population in frequent contact with people from Europe, from Japan, America, Australasia and so on, and there is no question at all of what is happening here bringing to pass any violent changes in our societies.

▶ *Would you say that contact with the West, and especially contact through workers who have gone for instance to New Zealand, has brought no movement towards unionisation for example, towards different fashions of life...?*

McGeever. — Indeed it has! Indeed it has! This is a process that has been going on in the Pacific for some time, but what is happening in Brussels on the question of our association or non-association with Europe I would not see as being a decisive factor in either accelerating or accentuating the natural processes that are going on.

As far as Fiji is concerned, if you'd like a sketch of Fiji, again I would say with Mr. Toma that it's very difficult to do this in a few words. Fiji is rather different from the other two Pacific countries in that it has a multi-racial society, the two principal elements of which are the indigenous Fijian population who are of Polynesian and Melanesian origin and an immigrant population of Indian origin who came to Fiji under

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the indenture system round about the turn of the century, principally to participate in the sugar industry.

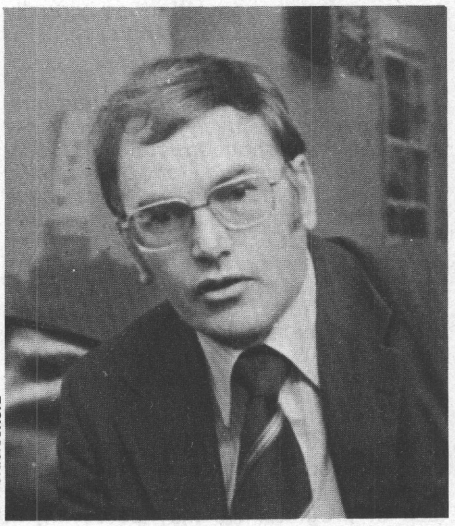
The population as a whole must now be approaching 600 000—I don't think we've quite got there yet. There are two main islands, Vanua Levu and Viti Levu, on which sugar is grown, at least on part of those islands, on the dry side. These are the two major areas of the population but there are in addition a number of other islands, at least another three hundred odd, some of them quite large. Some of what we might call minor islands would be bigger than Barbados, for instance; and then we have islands going down to one or two square miles or even less in extent, scattered over a very wide area of sea. And it is these outer islands, the centres mainly of the Fijian population, which are dependent on products such as copra and on subsistence agriculture with copra providing their cash income. As regards our trade generally, sugar has for the last few years provided a very substantial element in it, and of course the proportion of that sugar that has been marketed in Britain has been the cornerstone of stability within the industry. Apart from that, we have coconut oil, which varies as a percentage of the total exports, but is around about 10 or 12% in terms of value. We have a gold industry which for many years was in the doldrums, and in fact was the subject of a Government subsidy because it supported a whole community and was responsible for two or three thousand jobs, which the Government was simply not in a position to let run down. It only consists of one mine and it is in one isolated area. It has, in common with gold mines everywhere else in the world, benefited a little from the freeing of gold price of a few years ago, and I think I'm right in saying that for some time now it's no longer been necessary to pay them a direct subsidy to pay the divident with. And indeed the Company paid its first divident for, I think, certainly twenty odd years, last year. So the gold industry is enjoying a resurgence but, of course, is entirely dependent on the continuing world price of gold.

We have a tourist industry which has been the subject of quite a bit of Government promotion over the last few years, with tourists coming principally from Australia and New Zealand but to a considerable extent from the United States and Canada and to a lesser extent from Europe. Fiji is, or has been, at the centre of Pacific air communications, being an international airport en route between the United States, Canada and Australasia. For the same reasons it is a bit of a crossroads for maritime transportation, and we've had a lot of tourism from cruise-liners and so on and so forth. This of course has suffered of late because of the oil crisis and the general financial crisis which the world is undergoing. So that has not continued to be as dynamic a sector of our economy as perhaps it was three or four years ago. What else have we got in Fiji that's important?

Davidson. — Have you mentioned its importance as a trans-shipment port in the Pacific?

McGeever. — This again is part of its crossroads position. It has a certain entrepôt trade and transhipment rôle.

▶ *To come to the smallest of the territories, Tonga, perhaps I could ask Mr. Davidson to give a sketch of the economic situation of Tonga?*



R. Heiderscheid

B. R. Davidson

Davidson. — Tonga is a small island. It's unique. It's a kingdom with its own economies and social structure. It depends almost soley for its export income on coconuts and copra and to a much smaller extent on dessicated coconut which it exports, I think, almost solely to the United Kingdom. It has a population of about 90 000 people.

▶ *About 60% of whom are under 21?*

Davidson. — You may be right—I'm not sure of that—it probably is. This is a feature of both Tonga and Western Samoa and I think Fiji, that there is a large proportion particularly under the age of 15.

▶ *If that's right, this would seem to pose a big problem in the next five years, namely employment. Can the Convention help you to create jobs in the Pacific?*

Davidson. — Well, we would hope so... if I could just pick up a point, it's a more general point, that Mr. McGeever made on the question of regional cooperation. This is the particular interest that my organisation has in the Pacific, and we see our operation here in two stages in a context of regional cooperation. First, there's the substantive point that we look to Europe for aid, as distinct from the trade, and under the European Development Fund we'll get financial support for regional politics. In fact there has been at our suggestion some agreement that E.D.F. money can be used for regional projects which may include other countries in the region, for example my organisation comprises eight countries, in addition to the three Pacific Associables, there's Australia, New Zealand, the Cook Islands and Papua New Guinea, as well as Fiji, Tonga and Western Samoa, and we will be looking to regional projects part of which could be financed by the European Development Fund. But also there is a more general point that we see, that the very fact that the Pacific countries are negotiating together is to our mind a very important point of regional cooperation, by the three countries being together in this particular exercise—it has brought those three countries together—by their having discussed this with other countries in the region, this has tended to be an important aspect of furthering regional cooperation in the Pacific.

Toma. — On this question of employment, you are quite right that employing the young people of today is going to be a major cause of worry to all our three Governments in the next few years, and you asked if the current exercise with the European Community could afford us some help in this area. Yes, in this respect: back in our countries, although we can try and create job opportunities by starting up or developing industry—small industries etc.—one of our greatest hopes is agriculture. This is where we can employ large numbers of people. But we face another problem; we find that the youth of today go reluctantly to agriculture, they want to come to the towns and find jobs in the town. This trend is worsened by the fact that the return in agriculture is very poor and fluctuates enormously. It does not encourage an earnest fellow to make a career of agricultural production, say in copra or cocoa. So during this exercise we hope to get some kind of scheme of stabilisation out of Europe and we think this will go some way in assisting us to create or keep our people satisfactorily employed.

▶ *Is this equally true of the other territories?*

General agreement.

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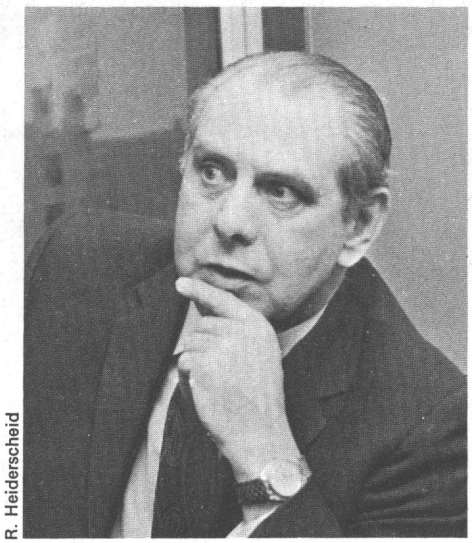
▶ *Mr. McGeever, perhaps you could tell me if it is of general interest to the Pacific countries to be involved in the institutions of the new Convention?*

McGeever. — The question of institutions is one which is yet to be tackled by the A.C.P. Group, who've always taken the view that it would be premature to consider institutions before the shape of the Convention which they are meant to serve is much clearer. Obviously, if the Pacific countries are to be Associates under the new Convention, they would expect to play as full a part in the running of that Convention as is necessitated by their membership of it. But at the same time it is rather difficult for us as newcomers to form any clear idea on this question of institutions until a rather fuller discussion of it takes place within the A.C.P. Group. The present Association, I think, has a set of institutions which by and large, from what we hear, appear to have functioned quite well. What changes will be brought into these will obviously depend on the debate that is to be held; but perhaps the only point that we can make from the Pacific aspect at this stage is that we are the furthest away from Europe of any of the Groups participating in the negotiations. As a group of three countries I think we certainly represent some of the smallest of the countries involved, and we should be very concerned that the institutions finally adopted should not involve us in expense in both terms of money and manpower which we would find hard to justify by the participation that we have in the Convention. These problems of expense and manpower are going to be particularly acute for the Pacific in terms of its active participation in the institutions of the Convention, and the number of the institutions which it will feel in a position actively to support. We look forward to the debate on this question.

▶ *One general question. It would be a pity to change something that has suited the way of life in the Pacific since the beginning. Is there any danger of an opening towards Europe involving new political institutions or commercial establishments etc. which would completely change the successful traditions of the Pacific way of life?*

Jones. — I don't think that association under a new Convention would have any danger of this whatsoever. There seems to be an exaggerated idea about the closed nature of our societies in the Pacific. They are anything but closed. We are after all in very close proximity to two very successful developed countries, Australia and New Zealand, and the inter-change between us and those countries is going on all the time. I personally don't see that being members of this Convention will open our sacks up any more than they are already open.



R. Heiderscheid

E. H. Jones

McGeever. — At the outset I think that the very reason why we are here, put in its very simplest terms, is the preservation of some kind of, if not a status quo, of a series of relationships which we already have, particularly with Great Britain. And I don't think in the short-term, perhaps in the course of the next five years, we would anticipate that any major changes will come as a result of the Convention. Obviously there are going to be opportunities for increased contacts, contacts of a more intimate nature, with European countries other than Great Britain and we shall welcome the opportunities when these arise; but it's not as though we do not at the moment have contacts with France and Germany in both a commercial and in other senses, so it's not something which is going to be revolutionary in any sense for our part of the world.

▶ *What might be the immediate preoccupations of the Pacific States after the Convention is finally signed. For instance, stabilising export receipts is something of great importance. I suppose you'll work on that?*

Davidson. — In terms of what might arise out of the Convention, yes, this would be the most significant feature for the economies of the three countries concerned. And also for Fiji, of course, sugar, whether it's inside or outside the stabilisation scheme...

Jones. — Let's face it, for Fiji probably the most important part of the Convention, or the arrangements which are now being negotiated, is sugar. And what's going to happen to the 140 000 tons which we've always been able to export to the UK under the Commonwealth Sugar Agreement?

▶ *Could you not hope to sell them on the world market at a much higher price?*

Jones. — Well, we're here because we are seeking a long-term agreement. If we didn't want a long term agreement and wanted to sell at the world market price, we shouldn't be here! The importance is long term.

▶ *Is it in any way true to say that with Britain going into the European scheme, and therefore no longer being one of your primary markets, you would replace the advantages you had in Britain with the advantages you will have in Europe?*

Jones. — We're not talking specifically about sugar here?

▶ *Largely but not specifically.*

Jones. — Well, as I said before, even if we become party to the Convention, with the trade arrangements which are now being negotiated we shall not be in as advantageous a position, in many respects, as we are now trading with Britain under the Commonwealth Preference Scheme. The only thing is that if we didn't become Associates, we should be in an even worse position. ■

Interview by
Barney TRENCH

The Pacific States are relatively further from Europe than the rest of the A.C.P., but "'tis distance lends enchantment to the view": sea and sun, coconuts and bananas give the islands their almost romantic South Sea charm.

Naud

Oil refinery at Port-Gentil (Gabon).

Energy in the A.C.P.

Energy, the foundation stone of the universe, is the basis of the industrial development that has divided the world into rich and poor. Ultimately, nuclear fusion—as opposed to the fission process that powers our present nuclear stations—promises an almost indefinite source of energy, but there is no way to predict when the fusion that gave us the atom bomb will be controlled to provide useful energy. Until then, the world will have to rely on fossil fuels, coal, oil and gas, imperfect nuclear power and the natural energy of the sun, wind, rivers and tides and the heat of the Earth.

The developing countries only consume some 15% of the energy presently produced in the world. Supposing that their development broadly follows the pattern of the industrialised countries, their needs might multiply by ten by the end of the century, quadrupling world consumption to 17-20 000 million tons equivalent oil a year. Inevitably, by the relative advantages it presents in production, transport and use, and because of the present dependence upon it, oil will provide the bulk of this energy. If gas, coal, nuclear power, hydro-electricity and new technology manage to supply half the needs for the year 2000—a big "if"—up to 10 000 million tons of oil a year will still be required. This seems an almost impossible target. Present production is a quarter of that figure. The world has so far discovered 140 000 million tons of oil and burnt 35 000 million of them. Already the O.P.E.C. producers are talking of reducing their output to conserve reserves. Recent oil strikes, in Mexico and the North Sea, for example, are no contradiction of expert opinions that undiscovered world oil reserves amount to perhaps 130 000 million tons, between an alarming minimum estimate of 40 000 million and a very optimistic maximum of 300 000 million.

The oil producers are making hay while the sun shines. By the end of the century, the end of the oil age will be in sight. What are the alternatives?

The figures quoted are highly provisional, above all in their assumption that developing countries will follow the pattern of energy production of the industrial countries. This pattern is hugely wasteful. Except, notably, in transport, fuel is burnt in a few big centralised plants to produce heat, mechanical energy, electricity and then industrial and domestic energy, transported over considerable distances. A high percentage of the original energy is lost in the process. Long-distance transport of electricity is economically feasible over little more than 1000 miles, a small distance on the African scale. Much more efficient use of energy can be made on the local scale by the use of whatever source is at hand or is most easily adapted to particular needs. Oil producers among the A.C.P. such as Nigeria, Gabon and the Caribbean will naturally develop oilfired industry, while countries with great rivers will use hydroelectricity.

But local power plants are often a more logical alternative than centralised power stations for the scattered populations of the A.C.P., on grounds of cost, efficiency, fuel and technical adaptability. While the industrial world struggles with massive research programmes into nuclear power, alternative oils and natural energy, the developing countries can lead the way in adapting on-the-spot energy supplies fuelled by anything from the sun to kitchen rubbish, at the same time as they harness their great central resources. This "dossier" looks at the range of possibilities open to the A.C.P. in the vital field of energy.

Current situation and problems of the energy sector in the A.C.P. countries

by Günter F. EICH

The role of energy in the context of development policy and the economic growth of non-industrial countries has not received much attention up to now. Only recently has this subject become of interest from the scientific point of view and from that of economic policy. In the perspective of the current world energy crisis, this article undertakes a first résumé of energy resources and production structures in the A.C.P. For most of these countries, oil evidently constitutes the main energy source and therefore the basis of their national economies. Because it is the prerequisite for development, the full weight of the oil price rises has come to bear on these countries, and their problems can be appreciated.

As regards **method**, a theoretical distinction between commercial and non-commercial energy seems necessary, such a distinction being significant for developing countries above all. Non-commercial sources of energy such as animal traction, wood (1) and animal dung for heating and cooking purposes still play a substantial role in the energy budgets of the developing countries. Of course, there is no useful documentation or statistical data on this.

The problem of **insufficient and not very up-to-date** information on commercial sources of energy as well makes it extraordinarily difficult to assess the situation and the development prospects of energy in most of these countries. Incomplete and not sufficiently comparable statistics and information make it difficult to be exact or indicate certain fine differences. However, an attempt has been made on the basis of the documentation and information available to give an initial sketch of the energy situation in the A.C.P.

(1) See page 69: "Making better use of wood for energy".

Energy resources and structure in the A.C.P.

GENERAL CHARACTERISTICS

An analysis of the data in Table 1 (*)—which gives a survey per country of the occurrence and application of primary sources of energy in the form of a kind of simplified energy balance sheet—enables conclusions to be drawn for each case.

Low level of energy consumption

Energy consumption is one of the first significant indicators of a country's level of development. In comparison with the industrialized countries, the energy requirements of the developing countries are absolute and relatively slight. The best yardstick for the energy consumption of a country is its per capita consumption of energy.

The associated countries in Africa, from the point of view of their relative energy requirements, occupy the bottom end of a world scale which is topped by the highly industrialized countries. For 1971 the values (expressed in terms of kilos of bituminous coal) are: U.S. 11 200, U.S.S.R. 4 500, Western Europe 3 900 and Japan 3 300. The world average gave a level of consumption of not quite 2 000 kg. As opposed to this more than half the 30 African associates showed, for the same period, a per capital energy consumption of less than 100 kg. Table 1 gives the following picture for the individual countries:

— 13 countries have an annual average per capita consumption of below 50 kg;

— 9 countries have an annual consumption of between 50 and 100 kg;

— 13 countries consume between 100 and 500 kg;

— only 1 country (Gabon) consumes more than 500 kg.

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(*) The comparative data are based on UN surveys and refer to the situation in 1971. This is the last reference year for which roughly comparable world figures were available when this article was completed.

This extremely low level of energy consumption fits in to a large extent with the other traditional indicators of economic well-being, such as the average per capita income and gross national product, which reflect the generally low level of economic development in the countries under review.

A special position is occupied by the Caribbean, where the relatively high level of energy consumption is something like that of the industrial countries. Here, however, the decisive factor is that these countries, as the sites of large export refineries, have a relatively high consumption of energy with a comparatively small population.

This remark applies also to some of the African countries at the upper end of the consumption scale, most of them likewise having an energy-intensive crude processing industry.

Dominance of oil

As regards the different forms of energy production, the following main structural characteristics can be discerned.

Only in 11 countries do *solid fuels* i.e. mostly coal, play any role at all. Of course such fuels, with four exceptions, have mainly to be imported. The use of *water power* is largely a reflection of its minor importance from the production point of view. An international grid, i.e. the export of electrical energy over the frontiers, exists only in embryo form. To some extent, *natural gas* also contributes to energy supplies in the four countries which have natural gas deposits that are exploited on a commercial scale. Without exception, however, all the A.C.P. countries are consumers of oil which, in the form of motor and heating fuel, is by far the most important source of energy.

Table 1 below shows in dramatic fashion the central importance of mineral oil imports in the energy budget of the associated partner countries. For no fewer than 31 of the 45 countries under review, oil accounts for more than 90% of their total energy needs, while for 15 of the them the figure is even 100%. In a further 7 countries the figure is over 50% and there are therefore only 2 countries remaining where oil accounts for less than half of their total energy consumption.

Energy supplies mainly dependent on imports

A characteristic feature of the assets side of the balance sheet, consisting of domestic production and imports, is that these countries' own production of primary energy is in general insignificant. This applies both to the absolute dimensions of domestic energy production and also to its relationship to domestic needs. Only two countries—*Nigeria* and *Gabon*—constitute a noticeable exception as producers and exporters of *crude* on a world scale. The *Congo* should also be mentioned as a new producer of crude in significant quantities. Only 5 countries produce their own *coal* and Zambia, especially, offers interesting prospects for further development. *Natural gas* deposits are exploited in 4 countries, inter alia, in the 3 oil-producing countries mentioned. In 20 countries there are *hydro-electric* power stations, but the installed capacity for the production of primary current is relatively slight.

With only a few exceptions, therefore, almost all the countries are net importers of energy. In most cases energy imports are the basis for energy supplies and in 15 countries the total energy supply is dependent exclusively on imports.

Nevertheless, exports play a considerable role in a number of cases. In the foreground of course are the growing crude exports from *Nigeria* and *Gabon*, which have become net exporters of energy.

In addition, bunkering for international sea and air transport should be taken into account. In the case of countries with numerous outside contacts and in a favourable strategic situation from the transport point of view, or with international military bases, this is of some significance.

An intensive and large-scale trade in oil is also characteristic for the islands in the *Caribbean*, which import crude for refining and export finished products. An exception is above all Jamaica which, in order to cover a relatively high domestic energy requirement, has become a net importer of energy.

ENERGY RESOURCES

This part of the survey presents a list of the energy sources known and opened up so far and the level of their development in the A.C.P. It should be said straight away that considerable changes are not excluded for the future. This applies above all to hydrocarbons and although to a lesser extent to the production of electricity from water power.

Coal

Up to now, coal deposits have been found and opened up in only a few of the associated countries. On the list of coal producers the only countries are *Nigeria, Swaziland, Zaire* and *Zambia* all, however, with relatively small outputs. So far, in all the associated African partner countries some 500 million tons of exploitable bituminous coal reserves have been located. These estimated reserves are broken down as follows: Nigeria 350 million tons, Zambia 115 million tons, and Zaïre, 73 million tons. In addition, Madagascar has some 60 million tons of known reserves. Finally small brown coal deposits have also been noted in Nigeria and on Madagascar, but no reliable verdict can yet be given regarding the possibilities of economic exploitation.

On the subject of future potential development and the presence of further bituminous coal deposits on the African continent, more particularly in the countries concerned here, the experts disagree, which is also true as regards the further working up of deposits which have already been found and are being exploited, assessment of mining conditions and the qualitative composition of the coal produced.

The most important producer of bituminous coal among the African associates is *Zambia* whose production is forging ahead, with an annual output which is rapidly nearing the million ton mark. The chances for further development of bituminous coal mining in Zambia are regarded as favourable.

Second place among the coal producers is occupied by *Nigeria* where production, after the interruption in the form of the civil war, has become largely normal again, with a yearly

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Tabl

Production, foreign trade and energy consumption i

REGION AND COUNTRY	PRODUCTION				
	Total energy	Coal and lignite	Crude	Natural gas	Electr. (hydro-electr.)
WEST AFRICA					
Ivory Coast	0.017				0.017
Dahomey					
Gambia					
Ghana	0.364				0.364
Guinea	0.003				0.003
Upper Volta					
Liberia	0.027				0.027
Mali					
Mauritania					
Niger					
Nigeria	99.826	0.194	99.286	0.149	0.197
Senegal					
Sierra Leone					
Togo	0.001				0.001
CENTRAL AFRICA					
Burundi					
Cameroon	0.142				0.142
Congo	0.045		0.018	0.020	0.007
Gabon	7.562		7.520	0.041	
Equat. Guinea					
Central African Rep.	0.005				0.005
Rwanda	0.012			0.001	0.011
Chad					
Zaire	0.542	0.112			0.430
EAST AFRICA					
Botswana					
Ethiopia	0.034				0.034
Kenya	0.040				0.040
Lesotho					
Madagascar	0.016				0.016
Malawi	0.018				0.018
Mauritius	0.006				0.006
Somalia					
Soudan	0.011	0.003			0.011
Swaziland					
Tanzania	0.044	0.003			0.041
Uganda	0.102				0.102
Zambia	0.930	0.812			0.118
CARIBBEAN					
Bahamas					
Barbados	0.004			0.004	
Grenada					
Guyana					
Jamaica	0.016				0.016
Trinidad & Tobago	10.802		8.694	2.107	
PACIFIC					
Fiji					
Tonga					
W. Samoa	0.001				0.001

Source: U.N.O.

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the A.C.P. countries in 1971 ('000 tons equivalent coal)

FOREIGN TRADE			CONSUMPTION					
Imports	Exports	Bunkering	Energy total		Solid fuels	Liquid fuels	Natural gas	Electr. (hydro-electr.)
			Total	Per capita (Kg coal-equiv.)				
1.281	0.149	0.110	1.246	282		1.228		0.017
0.101			0.101	36		0.101		
0.026			0.026	68		0.026		
1.376	0.150	0.665	1.648	186	0.031	1,254		0.364
0.401			0.404	101		0.401		0.003
0.074			0.074	13		0.074		
0.664	0.150	0.105	0.583	371		0.555		0.027
0.128			0.128	25		0.128		
0.182	0.011		0.171	143		0.171		
0.105			0.105	25		0.105		
0.102	93.333	0.060	3.334	59	0.208	2.780	0.149	0.197
2.206	0.118	1.575	0.550	137		0.550		
0.478		0.264	0.273	105		0.273		
0.147		0.003	0.145	72		0.144		0.001
0.039			0.039	11		0.036		0.003
0.434			0.576	97		0.434		0.142
0.221	0.018	0.007	0.240	251		0.213	0.020	0.007
0.009	7.233		0.522	1.033		0.481	0.041	
0.052			0.053	183		0.052		
0.093			0.099	60		0.093		0.005
0.027			0.038	10		0.027	0.001	0.011
0.111		0.007	0.104	27		0.104		
1.542	0.270	0.052	1.839	82	0.438	1.008		0.392
1.067	0.122	0.039	0.997	40	0.010	0.953		0.034
3.594	1.583	0.662	2.006	172	0.082	1.848		0.077
0.757	0.261	0.131	0.501	73	0.023	0.462		0.016
0.222	0.015		0.225	49	051	0.156		0.018
0.316		0.173	0.150	183	0.001	0.143		0.006
0.090			0.090	31		0.090		
1.930	0.030	0.054	1.913	119	0.001	1.901		0.011
2.015	0.986	0.040	0.944	60	0.005	0.899		0.041
0.675	0.040	0.007	0.730	72		0.665		0.065
1.086	0.004		2.011	470	0.830	0.663		0.518
16.415	13.448	0.851	0.939	5.078		0.939		
0.671	0.162	0.248	0.276	1.155		0.272	0,004	
0.739		0.012	0.727	988		0.727		
2.662	0.272	0.494	2.402	1.266	0.001	2.386		0.017
19.089	28.223	2.226	4.082	3.693		1.975	2.107	
0.518	0.052	0.240	0.225	424		0.225		
0.017			0.017	119		0.017	0.001	

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Table 2

Share of oil (%) in total consumption of primary energy in the associated A.C.P. countries

(Situation: 1972)

	100 %	99-95 %	94-90 %	89-80 %	79-70 %	69-60 %	59-50 %	49-40 %	39-30 %
Africa	Dahomey Gambia Upper Volta Mali Mauritania Niger Senegal Sierra Leona Somalia Chad Togo	Ivory Coast Ethiopia Guinea Equat. Guinea Liberia Mauritius Sudan Tanzania	Burundi Gabon Kenya Madagascar Central African Rep. Uganda	Congo Nigeria	Cameroon Ghana Malawi	Rwanda	Zaïre		Zambia
Other Regions	Bahamas Fiji Guyana West Samoa	Barbados Jamaica						Trinidad & Tobago	

output today of some 350 thousand tons. A relatively small output of bituminous coal on Madagascar was discontinued at the end of the sixties for economic reasons (for further details see Table 2 below).

Compared with the world situation the output of coal in the associated countries is small. Total output in 1972 reached 1.4 million tons, as opposed to a world production of 2 046 million tons, the associated countries accounting for only 0.5 per thousand of this world figure. On the known coal reserves side of the balance sheet there are the 500 million tons of the African associates, in comparison with 6 641 billion tons of world reserves.

In the light of these considerations, the relatively insignificant role of coal in the A.C.P. energy budgets is explained. Imports of bituminous coal also show a relatively weak trend. However it is not excluded that, under changed energy supply conditions in general, coal imports may experience a certain upsurge.

Water power

Suitable geographical and climatic conditions are the prerequisite for the use of water power to produce electrical energy. The use of water power is dependent upon sufficient and continually available reserves of water. Such conditions do not exist in all the A.C.P. Especially in the desert countries, which are short of rain, the use of water power is excluded right from the start. In other tropical rainy countries, however, there are prospects for a not inconsiderable expansion in the use of these natural resources.

In 20 of the countries under review water power is already today either the sole source or the main basis for the production of electricity.

Only for 1971 are the figures sufficiently detailed to arrive at a breakdown of the development of electricity production according to origin. We are interested here exclusively in the production of primary current, i.e. the production of electricity from water power, other primary sources for the production of electricity being considered later. For these, however, there are no useful statistical data. In the available figures, the difference can be seen between current produced from water power and the total production of current in mainly oil-fired thermal power stations.

On the primary energy balance sheets of the individual countries, the contribution of water power is usually a small one. On the other hand, estimates regarding the technical potential for the development of water power are usually much more generous; in most of the only lsightly industrialized countries they are two or three decimal points better. Only at the cost of comparatively very high investment expenditure would it be possible in some of the A.C.P. to open up further potential for the production of electrical energy. In a number of cases such projects could also produce desirable results for the country's water reserves.

The manifold advantages of electrical energy, however, are counteracted by certain disadvantages. Since the electricity produced from water power can only be transported to a limited extent and at relatively great expense over high-tension lines, it has to be possible to use it either on the spot or within a comparatively small radius. Where there is no large-scale electric grid—and this is the case in almost all the developing countries—together with the building of dams and power stations, investments have to be made in energy-intensive industrial undertakings and in the transport of the raw materials and finished products of these industries.

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At present there are three large hydro-electric power stations under construction in the A.C.P., namely, *Zaïre* (Grand-Inga, 34 000 MW and Inga, 5 180 MW) and *Zambia* (Kafui-Kariba). It should be mentioned that the Grand-Inga project is the largest currently underway in the whole world.

Other primary sources of electricity

Among the natural sources of primary electricity are *nuclear energy, geothermal energy* (heat from the interior of the earth), *solar energy* and *wind power*.

It seems that for the foreseeable future and for many reasons the use of nuclear energy offers little likelihood in most of the A.C.P. of making a substantial contribution towards overcoming the strained energy supply situation. The main reason is that the minimum economic size of a nuclear power unit makes it too big to be absorbed by the electric grid of a region with little industry, or would involve a disproportionate reserve power capacity. Further in the industrial countries plans for the expansion of nuclear energy have lagged far behind the initial high hopes.

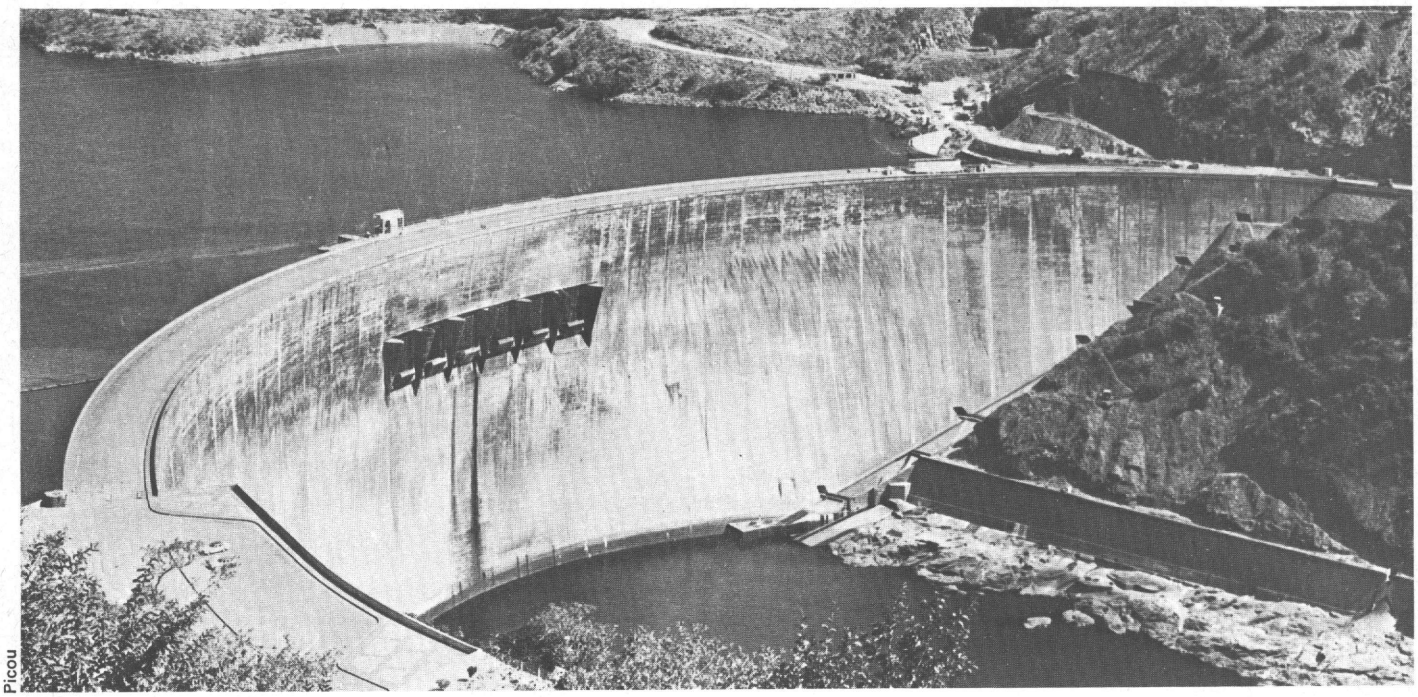
On the other hand, the use of windpower to drive generators is of some importance for the local production of electricity insofar as weather conditions guarantee a sufficiently uninterrupted supply of wind. Here, too, however, no significant data are available. There are only a handful of sites in the world where tidal power schemes would be worth serious considerations.

In all, this sector of primary energy production, except for water power, plays only a marginal role, which, however, in some circumstances, opens up interesting prospects.

Uranium

Uranium ore itself is not a source of energy but merely a raw material for the production of fissile materials. However, the inclusion of this raw material as the point of departure for the production of today's most modern form of energy is necessary and justified in a review of the natural energy resources of the associated countries.

Uranium ore deposits have already been discovered on the African continent on quite a large scale and there is reason to assume that there will be further deposits, which have not yet



Picou

The Kariba dam on the Zambesi river.

In some of the countries solar energy and sometimes geothermal energy could offer practicable possibilities for enriching the store of primary energy resources. Of course, the use of these unconventional energy resources is still subject to certain limitations on account of the attendant technical problems. Heat from the interior of the earth will in any case be of only local significance, since it rarely occurs in sufficient intensity. An economically viable solution to the technical problems connected with solar energy is still far off, although research in this respect is having ever greater funds devoted to it.

been located. Uranium ore prospecting is being carried on intensively in many African countries. As an aside here it should be mentioned that in very many cases uranium ore prospecting is associated with prospecting for hydrocarbons.

Of the 36 African A.C.P., 13 during the period 1973/1974, i.e. certainly a quarter, were actively prospecting for uranium ore (see map).

The number of countries in which prospecting for uranium ore deposits is carried on has increased rapidly in recent years. In four of the associated countries significant deposits have

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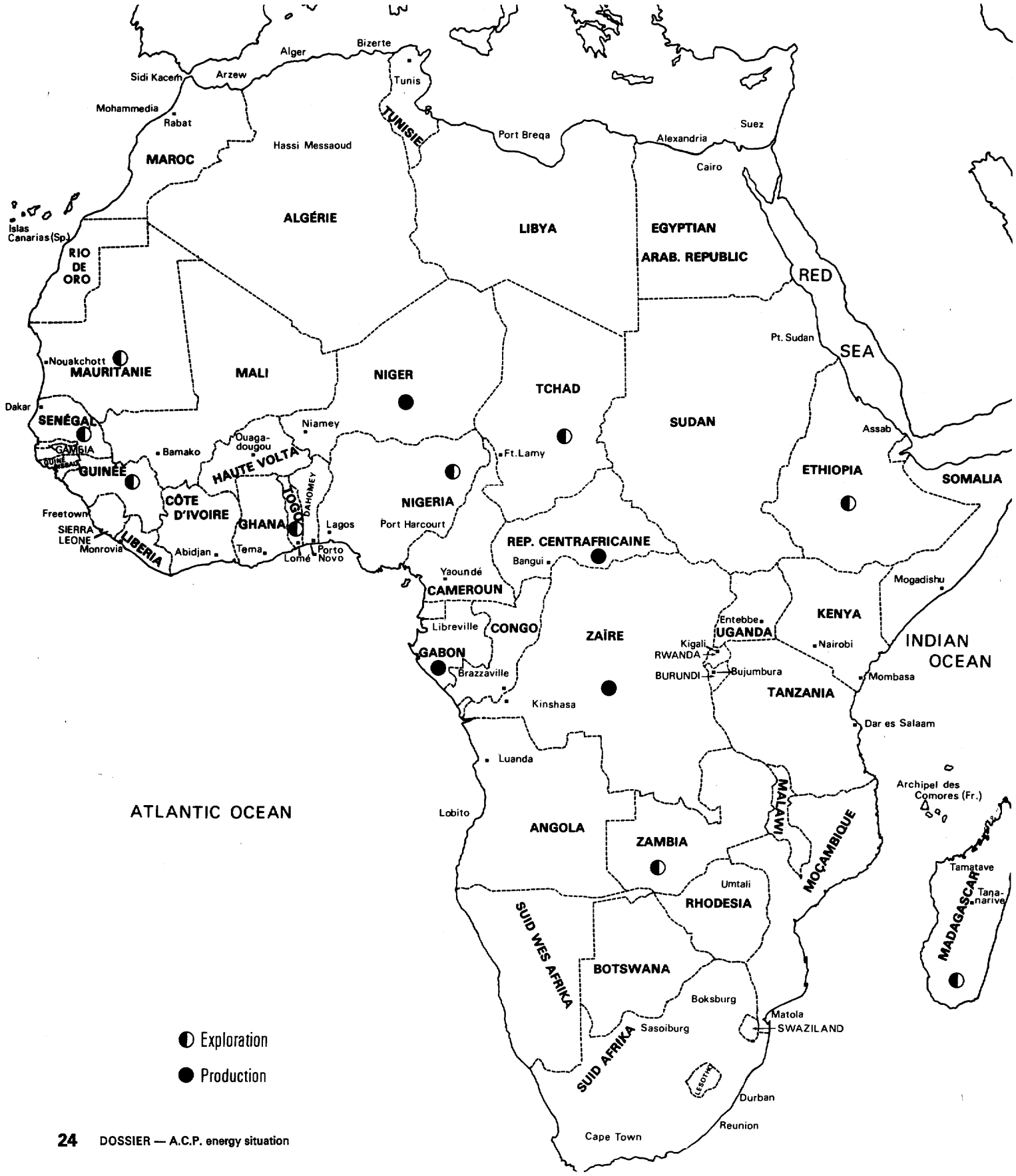
Uranium: prospecting and production in the A.C.P. countries in Africa
(beginning of 1974)



Association countries in Africa: estimated uranium resources
(Data available in January 1973)

Type of resources	Exploitable at less than $10 per pound of U_3O_8				Exploitable at less than $10 per pound of U_3O_8			
	Reasonably certain resources (reserve)		Additional estimated resources		Reasonably certain resources		Estimated additional resources	
	10^3 tons of uranium	10^3 short tons of U_3O_8	10^3 tons of uranium	10^3 short tons of U_3O_8	10^3 tons of uranium	10^3 short tons of U_3O_8	10^3 tons of uranium	10^3 short tons of U_3O_8
Gabon	20	26	5	6,5	—	—	5	6,5
Niger	40	52	20	26	10	13	10	13
Central African Rep.	8	10,5	8	10,5	—	—	—	—
Zaïre	1.8	2,3	1,7	2.2	—	—	—	—
TOTAL A.C.P.	69,8	90,8	34.7	45.2	10	13	15	19.5
WORLD TOTAL (rounded off)	866	1126	916	1191	680	884	632	821

(*) Dollars at price for March 1963: $1 = 0.829 u.a.

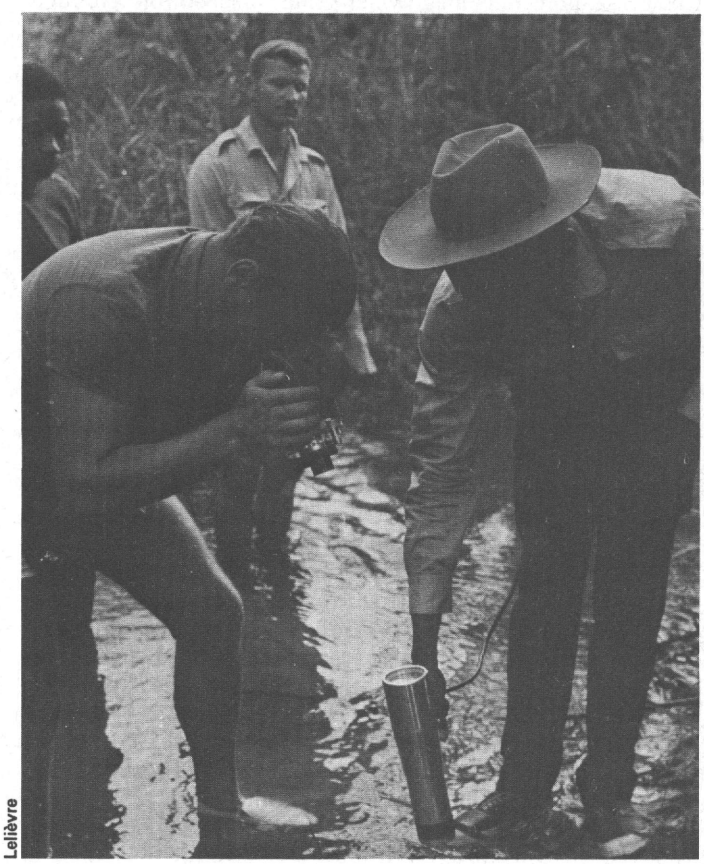
Source: O.E.C.D

already been located: *Niger, Gabon, Chad* and the *Central African Republic*. In Senegal also uranium ore deposits have been located together with phosphate deposits.

In *Niger* (1) and *Gabon* the production of uranium ore has been started. In *Gabon*, since the beginning of the sixties and in Niger since 1970, the deposits have been exploited on a commercial scale. Although *Niger* is the youngest member of the world uranium ore producers club, this country already occupies a top place in the league.

The Table below gives a few supplementary details regarding production and the size of estimated uranium reserves.

We have already mentioned above that the use of nuclear energy in the associated partner countries is subject to fairly narrow limitations. Uranium ore, as a source of energy for the producer countries can, therefore, only be considered to a certain extent. The economic significance of uranium mining is determined in the first place by export possibilities, and these are certainly very considerable. There exists, therefore, a specific community of interests between the developing and the industrial countries. The proceeds from exports of one raw material for energy (uranium) could moreover make a big contribution to financing imports of an other, namely oil.



Lelièvre

Using a Geiger counter in uranium prospecting.

Oil

Oil is already produced today in three of the associated partner countries on the African continent and on the island of *Trinidad* in the Caribbean.

Experience up to now and noticeable trends would seem to indicate that there will be a further considerable upsurge in significance for this sector in the future.

The *African continent* has recently become significant as a producer of crude oil and natural gas. Since the sixties North Africa has been one of the established crude producing regions in the world. However, in the countries south of the Sahara, and in the offshore regions in this part of the world, significant

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(1) See article: "Niger: the strangest uranium mine in the world" (p. 59).

production is being developed and there are increasing signs of the presence of further deposits. Of the African A.C.P., 24 are already prospecting. In 7 countries hydrocarbon deposits have already been located. In 3 countries, meanwhile, regular exploitation has started. In this connection, developments above all in *Nigeria* are impressive; oil production was started in 1957 with an annual result for 1973 which was already in excess of the 100 million ton mark, giving this country a place in the top league of world crude producers. In Gabon and the Congo, too, the annual production of crude is showing remarkable expansion after initial difficulties. In *Zaïre* oil production was started in significant quantities in mid-1974 and in *Dahomey* also preparations are being made for the production of oil on an economic scale.

On *Trinidad* (*Caribbean*) and in the island's offshore areas, oilfields have been exploited for many years. Annual production has fluctuated for some time between 5 and 10 million tons.

The oil obtained is mainly exported. The main markets for West African crude are Western Europe and the U.S. Only a modest fraction of the oil produced here remains to cover the country's regional needs and those of its close neighbours.

The production of crude in *Trinidad* goes entirely to the island's export refineries which ship finished oil products mainly to the U.S.

Natural gas

For the associated African countries natural gas is the newest source of energy but one which offers some interesting prospects for development. In **Nigeria** at the end of the fifties, a start was made with the exploitation on an economic scale of natural gas, in connection with the opening up and exploitation of the large oil deposits there. In **Rwanda** a deposit of natural gas has been exploited to cover regional supplies since 1966. In **Gabon** and the **Congo,** in connection with the opening up of oil deposits, natural gas which occurs there has been used on an economic scale since 1969. The trend for domestic use of the gas shows steady expansion. In the ten years from 1960 to 1971 the annual quantities produced have increased more than ten times. The total quantity of 77 million m^3 produced in 1971 is still extraordinarily small in comparison with the potential for this form of energy. However, large-scale injection of natural gas into the energy structure of these countries is dependent upon the creation of a distribution and supply network of pipelines, the building of which would raise exceptional difficulties in the A.C.P. It is therefore not surprising that in order to export her considerable natural gas reserves on an economic scale, **Nigeria** is looking around for suitable export possibilities among the non-African countries.

In the Caribbean, natural gas deposits occur and are being exploited on **Barbados, Trinidad** and **Tobago.** In Trinidad, especially, the annual production of natural gas is showing a remarkable expansion. Annual production rose from 766 million m^3 in 1960 to 1.7 thousand million m^3 in 1972. These quantities serve mainly to supply the considerable energy requirements of domestic refineries. The known reserves are, however, of such dimensions that preparations are being made for the export of liquified natural gas to the U.S.

Oil-bearing shale

The last of the oil-bearing resources, the oil-bearing shale deposits on **Madagascar,** must also be mentioned. These, with North American deposits, are among the largest in the world. However, the problem of extracting the liquid hydrocarbons from the ore has up to now been solved only imperfectly. In practice, the economically viable utilization of these natural resources still involves exceptional difficulties. However, it is not impossible that one day the current intensive research in this direction will bear fruit and the economic exploitation of this large energy potential will become possible.

Hydrocarbon deposits - situation and prospects

The particular significance of hydrocarbons as sources of energy and natural wealth requires a few additional comments regarding oil and gas deposits in the A.C.P. countries (1).

Prospecting activities

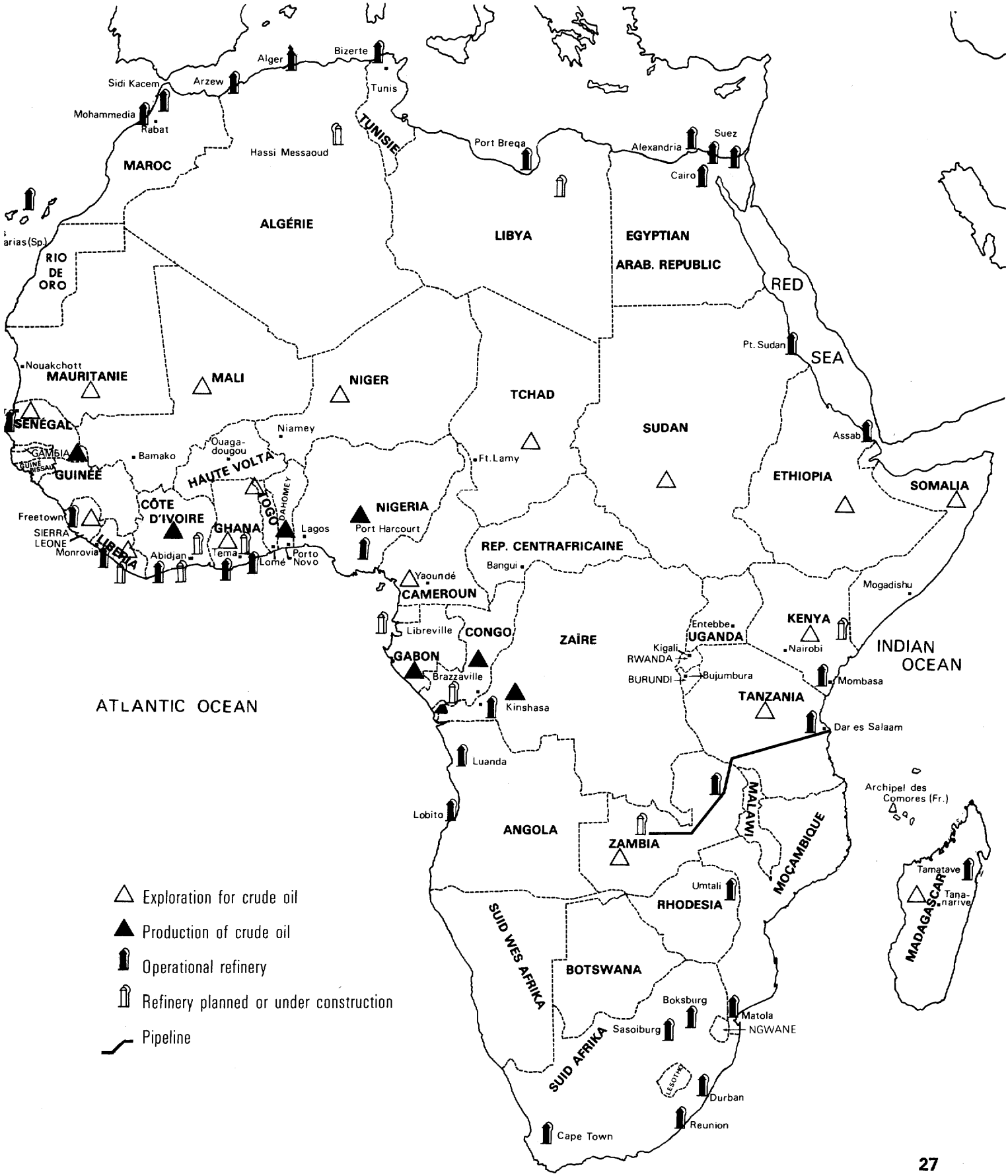
In the wake of an overall intensification of the quest for oil and natural gas deposits and the geographical extension of prospecting activities, efforts in this direction in the **African region** have been stepped up. Companies have acquired concessions not only on the African continent, but above all in the offshore regions of the West and East African coasts. The offshore areas of the Cape of Good Hope and then north again through the Straights of Mozambique up to the Gulf of Aden at the entrance to the Red Sea, especially, are recognized by experts as being very likely candidates for hydrocarbon deposits. A significant proportion of these prospecting areas belong to the A.C.P. As had already been said, most of the African associates are today the scene of intensive prospecting activities both on the mainland and in the territorial waters off the coast. The successes achieved in prospecting up to now, i.e. the fact that numerous promising oil and natural gas fields have already been located, has helped considerably to speed up prospecting activities in recent years (2).

The Caribbean, too, has experienced an upsurge in its significance as a promising territory for prospecting. Here, oil deposits have been exploited in some cases since the turn of the century. The island of Trinidad, where regular crude production was started as early as before the First World War, is one of the oldest producer countries. Prospecting over a wide area, i.e. to a large extent the offshore areas of the Caribbean archipelago and the South American coast, is opening up new and promising prospects. This applies especially to some of the countries and also some of the dependent territories which are to be associated with the European Communities, or which enjoy relations of a similar status.

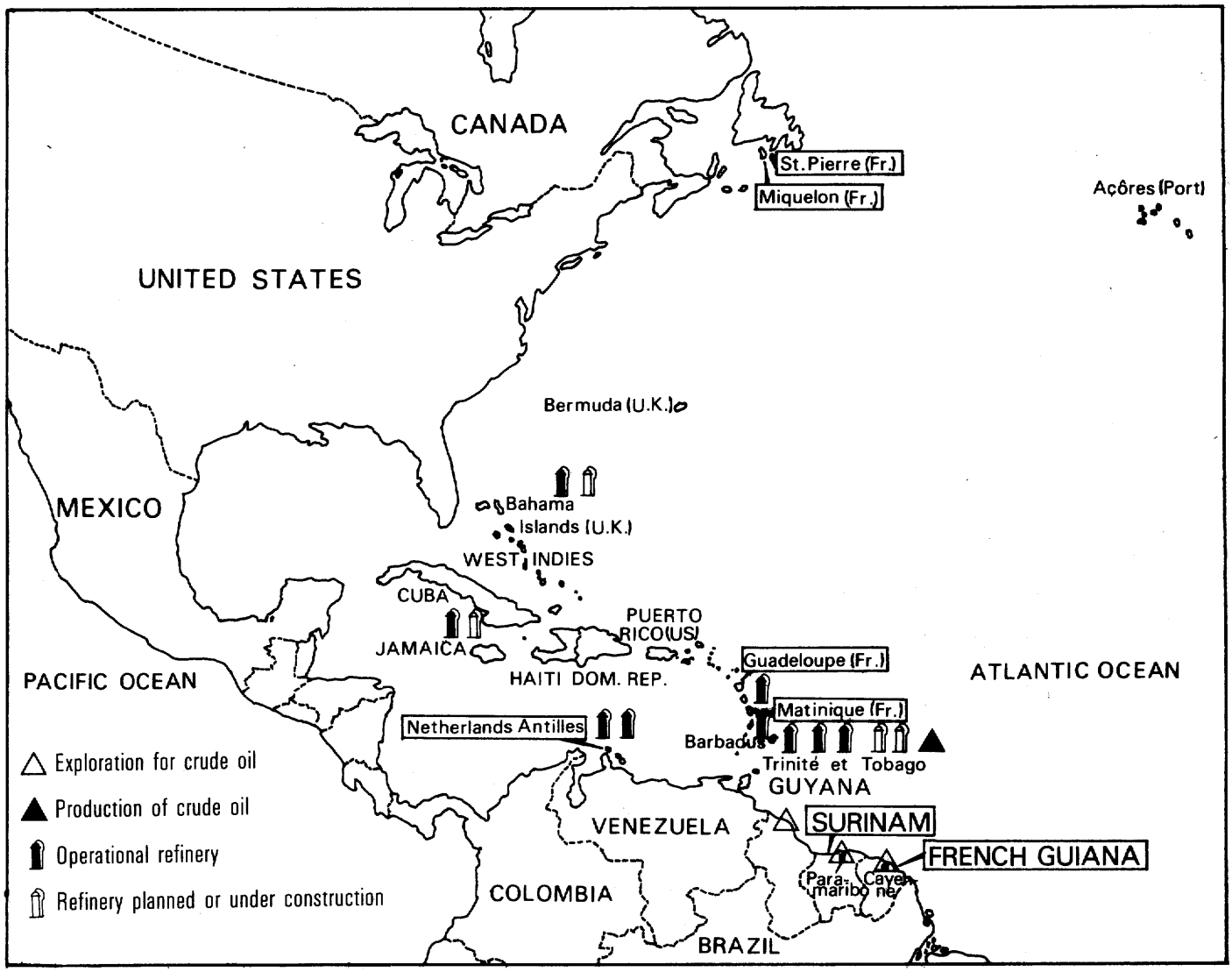
(1) Additional data on this subject will be found in: G.F. Eich, "The Petroleum Situation in the Overseas States and Territories of the European Communities", and in "European Petroleum Directory", Hamburg, 1970 edition, pages 15-173.

(2) See the detailed survey: G.F. Eich, "Oil in the African States and Madagascar" in "Courrier de l'Association", Brussels, May-June 1971, pp. 16-21.

Oil activities in the A.C.P. countries in Africa
(beginning of 1974)



Oil activities in the A.C.P. countries in the Caribbean
(beginning of 1974)



THE CRUDE-PRODUCING COUNTRIES

Nigeria

Among the A.C.P., Nigeria undoubtedly occupies a leading position from the point of view of mineral oil. After many years of prospecting activities which in some cases started shortly after the turn of the century, but were not intensified until the period after the Second World War, the first economically viable deposits were found in the Niger basin in 1956. In 1957, annual production was 173 000 tons. Since then more than 70 individual fields on the mainland and more than 20 others in the territorial waters off the coast, together with a number of natural gas fields, have been found. Annual crude production shows—with a relatively short-lived interruption as a result of the civil war disturbances—a rapid increase. In 1970 the 50 million ton mark was passed and in 1973 the 100 million ton mark was reached. As a result, Nigeria today occupies eighth place among the world oil producers and on the African continent she occupies second place after Libya. Known and exploitable reserves were estimated in 1974 at 2.9 thousand million tons, i.e. a volume of reserves which, on the basis of present production, will be sufficient for 28 years. In addition, in some twelve **natural gas deposits** discovered up to now, exploitable reserves of 1 120 thousand million m^3 exist. Present production is within fairly low limits and future exploitation of the deposits, which in some cases are situated deep inland, is not yet certain. The most important **oil producers** in the country are Shell and BP which in 1973 via a joint subsidiary, accounted for 65.6

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Oil activities in the A.C.P.

Situation : mid-1974

Region and Country	Prospection		Production of crude oil		Natural gas	Refineries a)	Petro-chemicals a)	Liquified gas a)
	Onshore	Offshore	Onshore	Offshore				
WEST AFRICA								
Ivory Coast	●	●				●○		
Dahomey	●	●		●				
Gambia	●	●						
Ghana	●	●				●		
Guinea								
Upper-Volta								
Liberia		●				●○		
Mali	●							
Mauritania	●	●						
Niger	●							
Nigeria	●	●	●	●	●	●		
Senegal	●	●	+	+	+	●		
Sierra Leone	●	●				●		
Togo	●	●				○		
CENTRAL AFRICA								
Burundi								
Cameroon								
Congo	●	●	●	●				
Gabon	●	●	●	●		●		
Equat. Guinea								
Central African Rep.								
Rwanda								
Chad	●							
Zaire	●	●	●		+	●		
EAST AFRICA								
Botswana								
Ethiopia	●	●				●		
Kenya	●	●				●○		
Lesotho								
Madagascar	●	●				●		
Malawi								
Mauritius								
Somalia	●	●						
Soudan	●	●				●		
Swaziland								
Tanzania	●	●				●		
Uganda								
Zambia	●					●○		
CARIBBEAN								
Bahamas						●○		
Barbados						●		
Grenada								
Guyana	●	●						
Jamaica						●○		
Trinidad & Tobago	●	●		●		●●●○○	●	○
PACIFIC								
Fiji								
Tonga								
W. Samoa								

+ Discoveries of no commercial value

a) ● represents an existing refinery, ○ a refinery being planned or built.

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million tons, about two thirds of national production. Among the European Community countries, the French ELF/Erap group is active with 3.4 million tons in 1973, and the Italian ENI subsidiary, AGIP (1973: 2.4 million tons). Further producers are the US companies Gulf Oil (18.2 million tons), Mobil Oil (10.9 million tons) and a joint affiliate of Chevron and Texaco, producing relatively small quantities. The Nigerian government has begun to participate in the oil companies and is aiming ultimately at complete control of the country's oil industry.

Gabon

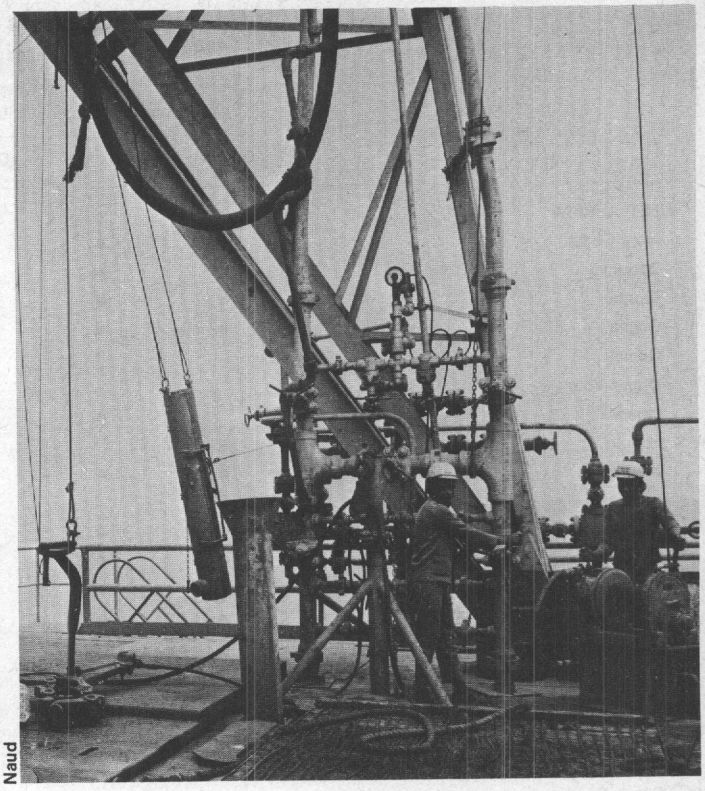
Although distinctly behind Nigeria, Gabon is the second largest oil producer among the A.C.P. The production of crude in this country started at almost the same time as in Nigeria. After completion and commissioning of an extensive system of pipelines, which was necessary to collect and transport the crude produced, growth in the quantities produced annually speeded up. In 1973 annual production amounted to 7.5 million tons. Of this, 6.3 million tons were produced by ELF/Erap alone, while the rest was accounted for by Shell. Today, there are some two dozen individual fields in Gabon, of which about half are on the mainland and the other half in the area off the coast. At the beginning of 1974 the figures for known reserves were 214 million tons of oil and 182 thousand million m^3 of gas. The economic exploitation of natural gas is making relatively rapid progress and the figure for 1973 was approx. 55 million m^3. Known reserves will permit the economic exploitation of much larger quantities as soon as suitable markets have been found.

Congo

The opening up of hydrocarbon deposits in the Congo took place in close association with, and to a large extent at the same time as, similar activities in the neighbouring country, Gabon. Even so, the expansion of production got off to a very slow start and for a fairly long period even tended to decline until, with the commissioning of the offshore field Emeraude in 1972, a substantial rise in production was recorded with 15 000 tons in 1971, 335 000 tons in 1972 and 1.7 million tons in 1973. Production is accounted for by two roughly equal groups, namely an affiliate of the French ELF/Erap group and a consortium consisting of the Italian AGIP concern and the Congolese government, each with a 50% participation. Up to now, four individual fields have been found and brought to the production stage, two being on the mainland and two off the coast. At the beginning of 1974 known reserves were some 700 million tons of oil and 28 thousand million m^3 of gas.

Zaïre

After preliminary prospecting which lasted many years but which was to some extent affected by uncertain legal and ownership questions, the first field was found in the Congo estuary. These reserves were estimated at 28 million tons of oil and 2 000 million m^3 of gas. In 1973 production on an economic scale was started experimentally and it is expected that, in the course of 1974, substantial and regular production of crude will be started in this country also.



Naud

Oil prospecting off the Gabon coast.

Other African countries

As well as in the countries mentioned and in a number of cases for some time already there have been sure signs of the existence of hydrocarbon deposits in the following countries as well: **Cameroon, Dahomey, Ghana** and **Senegal.** The size of these deposits and the question of exploitation on an economic scale are not entirely clear, however. If we look at the Caribbean we see that among the A.C.P. here, there is oil production on Trinidad. Since 1908 numerous oil fields on the southern half of the island and in the offshore region have been operated by mainly US groups. The annual production figure has been varying for some time between 6 and 10 million tons per year. In 1973, 8 million tons of oil were extracted from the deposits. The prospects for the opening up of new and larger deposits, above all in the island's offshore region are regarded as favourable. At the beginning of 1974 known reserves were estimated at 314 million tons of oil and 140 thosuand million m^3 of gas.

There are also positive signs of the presence of hydrocarbons on the island of **Barbados** where for several years small quantities of natural gas have been exploited on an economic scale.

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In this connection it should be pointed out again that prospecting in the territorial waters off the coast of South America is generally regarded as extremely favourable. This applies also to **Guyana.** Here it should also be stated that the regions to the east of the latter, **French Guyana** and **Surinam** (previously Netherlands Guyana) have already qualified as promising prospecting areas.

IMPORT-DEPENDENT OIL SUPPLIES

Apart from the small number of countries which have already worked up oil production of their own, most of the associated partner countries are dependent on imports of oil. In this respect, therefore, there is even to some extent a community of interests with the supply structures of the import-dependent industrial countries.

In terms of quantity, imports of finished oil products dominate the scene. Of course, the share of crude oil in total imports is growing at the same extent as the building of new crude oil refineries in the African countries, insofar as each country does not have its own, exploited, crude oil deposits. This trend, which is characterized by the building of new and comparatively small refineries in more and more African states, seems altogether to be the dominating one. It is accompanied by a gradual strengthening of the share of crude in total oil imports.

On the other hand, there are more and more signs that the supply of finished oil products on the world market will increase and will require markets in the developing countries. The O.P.E.C. and O.A.P.E.C. countries, especially, are endeavouring to supplement their crude exports by an increasing number of finished products. Import-dependent developing countries are considered in this respect to be promising markets. These conflicting trends—the importing countries wish to set up their own crude oil refineries on the one hand, and the attempt to increase exports of finished products by the crude-producing countries on the other—will certainly cause problems for the future.

In the **breakdown of imports according to origin,** the supply structure of the associated countries displays the following characteristics: in the **West African region** there is an increasing tendency to obtain supplies from the neighbouring producer countries and this applies both to supplies of crude and those of finished refinery products. The **East African countries** and **Madagascar** obtain their oil almost exclusively from the Middle East. The islands in the **Caribbean,** with the exception of **Trinidad** and **Tobago** obtain the crude for their export-orientated refineries mainly from neighbouring Venezuela.

On the other hand significant quantities of African and Middle East crude have recently been refined. There are not many signs of any radical change in the geographical basis of the supply structures for the foreseeable future.

THE REFINERY INDUSTRY

The level of efficiency of a country's refinery industry continues to be regarded as the main sign of its significance regarding mineral oil; refineries are an image and a symbol of modern industrial life.

The installed **crude refining capacity** of the A.C.P. amounted at the beginning of 1974 to some 66.4 million tons per year. In the regional breakdown, however, there is a distinct concentration of installed capacities in the Caribbean. Here alone, 49.9 million tons of annual processing capacity is concentrated among 6 major refineries, among them one plant with an annual output of more than 25 million tons and another with an output in round figures of 18 million tons.

The total refinery volume in the 14 refineries of the African partner countries amounted to only 16.5 million tons per year. The average output of the individual refineries is thus situated at around 1 million tons per year. The 3 largest plants with an annual output of over 2 million tons are in Nigeria, (3 million tons per annum), Kenya (2.4 million tons per annum) and Ivory Coast (2.2 million tons per annum).

In **technical equipment** also there are distinct differences between the refineries in Africa and those in the Caribbean. The African refineries, which are equipped to supply the domestic markets or neighbouring countries, mainly have relatively simple technical equipment and are tailored to producing the most important oil products for domestic needs. On the other hand, the export-orientated refineries in the Caribbean are quite different and, in both the range of products and the level of quality, are directed at the extremely high requirements of the demanding US market.

The importance of the Caribbean

The **Caribbean,** in particular, is increasing in importance as an **international refinery centre.** The original reason for this was its particularly favourable geographical situation for supplying east-west and north-south international air and sea traffic and the fact that it is a supply axis between sources of crude in Latin America, the Eastern Hemisphere and the North American markets.

Not only the traditional refinery sites such as **Trinidad** and **Tobago** are profiting from this upsurge in significance and are planning new plants and expanding capacity but, over the last 10 years, the associated countries such as **Jamaica,** the **Bahamas** and **Barbados** have also built refineries and are planning in some cases to build further plant. Numerous other countries on the chain of islands between South America and North America are also endeavouring to take advantage of their favourable supply and marketing situation between the crude-producing countries and the import-dependent North American market. Alongside the sovereign island states which are associated with the European Community there are further regions with which the Community has relations similar to Association and which also have a highly developed and significant refinery industry. These are the **Netherlands Antilles** and **Martinique.**

African characteristics

The following comments are also of interest for the mineral oil processing industries in the **African region.**

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Trend for known reserves of crude in the associated African Countries

(Situation at the beginning of each year)

Mill. t.

Year	Nigeria	Gabon	Congo	Zaïre
1963	55	25	—	—
1964	69	25	—	—
1965	137	25	—	—
1966	408	25	1	—
1967	475	29	1	—
1968	482	49	1	—
1969	543	65	1	—
1970	679	70	1	—
1971	1 263	96	1	—
1972	1 576	104	440	—
1973	2 024	152	669	—
1974	2 860	214	700	28

Situation as regards known reserves of hydrocarbons in the Associated A.C.P. Countries

(Situation: beginning 1974)

		Crude Millions tons	Natural gas 1000 mills. m^3
Africa	Congo	700	28
	Cameroon		
	Dahomey		
	Gabon	214	182
	Ghana		
	Nigeria	2.857	1.120
	Senegal		
	Zaïre	28	2
Caribbean	Barbados	?	?
	Trinidad & Tobago	314	140

Consumption of oil per inhabitant in the Associated A.C.P. Countries

(Situation :1972)

	Less 25 kg	25-50 kg	50-100 kg	200-300 kg	200-300 kg	400-500 kg	900-1000 kg	1000-2000 kg	4000 kg and over
Africa	Burundi Upper-Volta Niger Mali Rwanda	Dahomey Ethiopia Malawi Nigeria Somalia Tanzania Chad Zaïre	Cameroon Gambia Guinea Madagascar Centre. Afric. Republic Togo	Ghana Equat. Guinea Kenya Mauritius Mauritania Senegal Sierra Leone Sudan Uganda	Congo Ivory Coast Liberia Swaziland		Gabon		
Other Regions				W. Samoa		Fiji	Guyana	Barbados Jamaica Tinidad & Tobago	Bahamas

The trend up to now and projects and plans which have become known would cause one to expect that in this region an increasing number of small and medium-sized refineries, i.e. with an annual processing refinery capacity of between 1 and 5 million tons per year, will most probably be built in the course of the next few years. A characteristic of most refineries in the African region is that they are owned by a consortium. Alongside the joint interests of French, Netherlands, British, Belgian, Italian and American oil companies, there is in most cases a participation by the host country in the national refinery industry. The ownership structure of the refinery in Gabon is of particular interest here; in addition to foreign investors, i.e. seven multinationals, the governments of four neighbouring states also have a stake (1). To this extent, the refinery represents a genuine model of an international joint refinery on African territory and perhaps an example which may lead to similar thinking In other countries.

(1) Ownership of the SOCIÉTÉ ÉQUATORIALE DE RAFFINAGE in Gabon is as follows: CFP 18.75%; ELF/ERAP 18.75%, Mobil Oil 12.50%, SHELL 12.50%, TEXACO 6.00%, PETROFINA 3.50%, BP 3.50%, Gabon Government 5.60%, Cameroon Government 5.00%, Chad Government 5.00%, Central African Rep. Government 5.00%, Congo (Brazzaville) Government 5.00%.

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Refining capacities

(Situation as at 1 January each year)

(In millions of tons/year)

REGION	1939	1957	1961	1972	1973	1974
West Africa						
Ivory Coast	—	—	—	1.000	1.000	2.200
Ghana	—	—	—	1.300	1.300	1.300
Liberia	—	—	—	500	500	500
Nigeria	—	—	—	2.750	2.750	3.000
Senegal	—	—	—	600	600	900
Sierra Leone	—	—	—	500	500	500
Central Africa						
Gabon	—	—	—	600	600	850
Zaïre	—	—	—	700	700	800
East Africa						
Ethiopia	—	—	—	500	500	720
Kenya	—	—	—	2.400	2.400	2.400
Madagascar	—	—	—	500	500	500
Sudan	—	—	—	1.000	1.000	1.100
Tanzania	—	—	—	680	680	850
Zambia	—	—	—	—	—	1.230
West Indies						
Bahamas	—	—	—	12.500	12.500	25.000
Barbados	—	—	—	750	750	150
Jamaica	—	—	—	1 325	1 325	1.650
Trinidad & Tobago	3.900	5.050	14.350	21.825	22.825	23.050
Total A.C.P.	3.900	5.050	14.350	49.430	50.430	66.700
Percentage of world capacity	1.2	0.8	1.3	1.8	1.7	2.1

LONG-DISTANCE PIPELINES

Long-distance pipelines are significant for an oil nation's industry.

The far-flung pipeline network of **Nigeria** occupies first place here. In recent years an extensive network of pipelines has been established and this connects the regionally scattered individual oil fields, via collection and transport pipelines, with the collection and shipping points on the coast. The building of this efficient system of pipelines was the necessary prerequisite for the development of Nigeria's deposits of crude and their exploitation. In all, in this country today there are some 1 000 km of mainland and offshore long-distance pipeline.

The development of crude oil supplies in **Gabon** was similarly dependent on the building of an extensive network of pipelines by means of which fields off the coast and on the mainland were connected with the shipping points. The overall length of the pipelines laid in Gabon is today approx. 200 km.

The **Congo** also now possesses the beginnings of a pipeline network for the further development of its recently started oil production.

Whereas the above-mentioned system of pipelines is exclusively export-orientated, i.e. it conveys crude from the fields to the shipping points on the coast, the important supply pipeline we come to now conveys crude oil from the coastal ports to an inland refinery. It connects the port of Dar-es-Salaam in **Tanzania** with a refinery (a second is planned) in the inland state of **Zambia** over a distance of 1 500 km.

On **Trinidad** too, the individual oil deposits are to some extent inter-connected by a long-distance network of pipelines, which in turn serves loading points.

Ports

For the oil-exporting countries, after pipelines and collection plant, the availability of suitable ports or loading points is a prerequisite for the development of domestic crude production. In the world-wide supply and logistic strategy of the international mineral oil system, the transport factor plays a very important role in bridging the almost inevitable physical separation between oil supplies and the regions of consumption.

Africa's significance from the point of view of mineral oil supplies has also been increased recently by the establishment of important loading points. In Nigeria there are today 5 major loading points (Escravos, Forcados, Brass River, Bonny, Calaba) which can all be served by tankers with a displacement of up to 150 000 tons. In Gabon there are 2 loading points in operation, one of them being the port of **Gamba** which can also be used for fairly large tankers with a displacement of up to 150 000 tons. In addition there is the loading point, **Cap Lopez,** which is accessible only to fairly small tankers, however. Two loading points for Congo crude have also become available meanwhile.

The significance of such ports and loading points is not confined only to Africa, but should be placed in an overall logistical context covering the supply stream from the Middle East region round the Cape of Good Hope and northwards along the West African coast to Western Europe and on in some cases to North and South America.

The effects of increases in the price of crude oil

The escalating increases in crude prices in recent years by the producer countries belonging to the **Organisation of Petroleum Exporting Countries** (O.P.E.C.) and the **Organisation of Arabian Petroleum Exporting Countries** (O.A.P.E.C.) have increased financial expenditure for payment of the mineral oil imports needed by the import-dependent countries to such an extent that many of them have landed in serious financial difficulties. This applies not only to numerous industrial countries, but also to the great majority of the developing countries, i.e. most of the associated partner countries of the European Communities.

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THE CRUDE OIL PRICE TREND AND ITS CONSEQUENCES

Crude prices, which since 1961 had shown hardly any change, have been displaying since the end of 1970 a tendency to rise and this subsequently became rapidly more acute resulting in the course of 1973 in a doubling for the first time of the price of crude by comparison with the level at the beginning of the sixties. This price rise continued on into the summer of 1974 with the result that today the price of crude is some 5 to 6 times as high as it was before the beginning of the price escalation process. Whereas the price of crude up to 1970 was on average $2 per barrel (approx. $14 per ton) the crude price in the spring of 1974 was already from $10 to $12 per barrel (i.e. between $70 and $84 per ton).

The reason for this trend were the decisions by the O.P.E.C. countries to increase sharply the taxes and dues on the crude produced in their countries. In a series of joint decisions, the producer countries have permanently changed the procedure for calculating government dues on national oil production, with the result that the average government income per ton of crude produced has in some cases increased tenfold.

In the wake of this trend the flow of foreign exchange from the oil-importing countries to the O.P.E.C. countries has increased many times over and has piled up there in hitherto unknown quantities. Provisional estimates drawn up in various competent quarters lead us to expect that the revenue of the O.P.E.C. countries will rise from 8 000 million dollars in 1970 to approx. 100 thousand million dollars in 1974. Since these massive accumulations of capital can find investment outlets in the O.P.E.C. countries themselves only to a small extent, serious difficulties have already arisen in inserting these funds into international economic life without completely disrupting the whole international currency system and its machinery. The complexity of this problem has much in common with an attempt to square the circle.

Effects on the oil-importing countries

The first immediate consequence of the oil price increases is a substantial rise for the oil energy bill and a corresponding burden on the balance of trade of the oil-importing countries. These additional burdens on the balance of trade will lead to a growing deficit balance vis-à-vis the O.P.E.C. countries. It is already clear today that in the years to come many countries will have great difficulties in keeping their foreign trade balances in equilibrium. In the years to come Western Europe, for example, will presumably have to devote nearly half of her total foreign exchange income to payment of her oil imports.

For the developing countries the ratio is in principle similar if they, like the industrial countries, are dependent upon oil imports. World Bank calculations have shown that the developing countries as a group will need for 1974 additional injections of outside capital of some 2.6 thousand million dollars and for 1975 some 6.8 thousand million dollars in order to be able to pay for their urgently needed oil imports, after their modest foreign exchange reserves have been used up.

EFFECTS ON THE A.C.P. COUNTRIES

It is always a special problem if an attempt is made to go into detail in such overall quantitative calculations for a small group of countries. This applies also if one is endeavouring to quantify the amount of the actual foreign exchange burden, i.e. extra burden, for the associated A.C.P. countries. Insufficient data and problems of method are the basic reason for the difficulty in establishing the actual import needs of the individual countries. In particular, it is possible only to a certain extent to discover actual net import needs, i.e. to eliminate from total imports any transit quantities such as bunkering supplies for international shipping and air traffic. In some cases there is also a not inconsiderable oil requirement for the supply of foreign military bases. Occasionally such quantities even make up the main proportion of these national needs which, however, cannot be set off against these countries' foreign exchange. Finally, there is the methodological problem of assessing the oil foreign exchange balance in the case of the oil exporting countries of Nigeria and Gabon which, as a result of the general rise in the prices of crude show a considerable surplus on income which in future will increase even more. These two countries have therefore been excluded from the following calculation.

The financial burden of the individual A.C.P. for 1972-1975 can be calculated on the basis of domestic needs in 1972. This is the last year for which appropriate data ware available. Insofar as, from the documentation available, there was no difference between actual domestic needs and imports, both values were assumed to be identical. On the basis of the further hypothethis that, in the following years 1973 to 1975, no substantial change in the requirements would take place, the foreign exchange burden may be obtained by assessing the basic quantities for 1972 together with the expected oil price trend for the various years.

On the basis of this calculation, which should be regarded as a **minimum** one, since it applies to the volume of consumption for 1972 and did not take into account any possible increase in needs, it turns out that there was an increase of financial expenditure for the payment of oil imports into the A.C.P. countries from 295 million dollars in 1972 to 1.1 thousand million dollars in 1973 and to 1.5 thousand million dollars in 1974. For the countries on the African continent alone, there is an increase of the financial burden from 260 million dollars in 1972 to over 1 000 million dollars in 1974. Depending to what extent import trends have meanwhile tended to rise, the values shown can in individual cases be raised by a few percent.

Different burden for the individual A.C.P. countries

However, the individual associated partner countries are affected to a varying degree and in different proportions by the very general trend shown here.

Insofar as they already have a developed production of crude, such as **Nigeria** and **Gabon**, the countries are even favoured by the general price increases. The same will presumably apply soon to the **Congo** and also **Zaïre**. It should be pointed

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out here already that Nigeria has been a member of O.P.E.C. since 1971 while the Congo too has enjoyed the status of an associate member of O.P.E.C. since the end of 1973. Both countries, therefore, automatically benefit from the price policy pursued by O.P.E.C. which, however, in turn is partly to the disadvantage of other partner countries associated with the European Community.

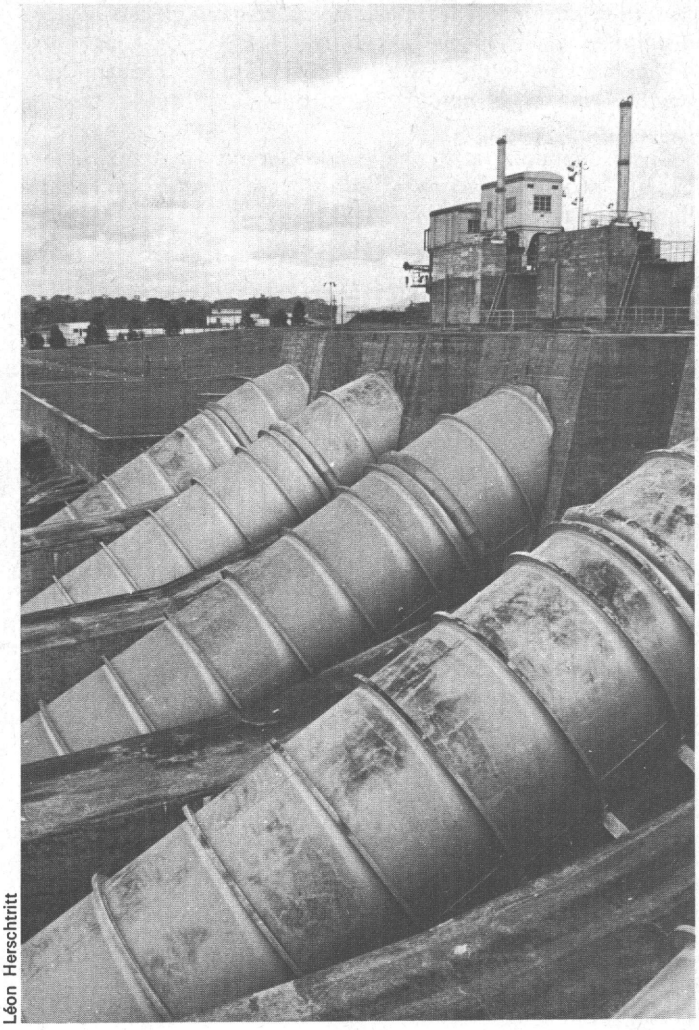
An exception is also constituted by the island states in the Caribbean which, as the sites of highly developed and export-orientated refineries, can pass on higher crude prices to others by means of the export proceeds from oil products.

Certain other countries present a relatively favourable picture as regards foreign exchange. They have benefited from the increased prices for their main export goods and can now dip into relatively comfortable foreign exchange balances.

Another group of countries is made up of those associates which in the not too distant future may be expected to start producing crude on an economic scale, possibly exporting it.

If we do not take into account the specific situation of these favoured countries, there are still quite a number of countries left over which are already confronted with problems of which they certainly cannot overcome by their own efforts. The economic potential of these countries is not sufficient to scrape together the foreign exchange needed to pay for their oil imports. With their oil imports imperilled, these countries are faced with a situation in which they cannot even maintain their economies at the level reached, let alone carry out the desired development programme.

Among those associate partner countries whose economic situation is not very strong and whose foreign exchange reserves have been stretched for years are the following in particular: **Ghana, Kenya, Tanzania, Madagascar,** the **Sudan, Ethiopia, Somalia** and, in the Caribbean, **Jamaica.** The economic distress of these countries is further emphasized by the fact that some of them, in accordance with the World Bank definition, are low income countries whose gross net product is less than 200 dollars per head per year, namely, Ethiopia, Kenya, the Sudan and Tanzania.



Léon Herschtritt

Giant water conduits at the Edéa dam (Cameroon).

NEED FOR JOINT INTERNATIONAL ACTION

For most of the developing countries and quite a number of the A.C.P. the additional problem of financing the fertilizer imports they need arises as an indirect consequence of the rise in oil prices and the resulting higher cost of petrochemicals. No less dramatic for the predominantly agricultural developing countries than the question of their oil is guaranteed fertilizer supplies, this being a question of vital significance in view of the (for many, catastrophic) food situation and explosive demographic growth. Giving up fertilizers would mean a shortage of already insufficient food and would bring in its turn the need for additional imports of foodstuffs for which, again, additional exchange expenditure is necessary. A negative spiral has started: the oil price increase, the foreign exchange burden and the shortage of fertilizers are only aspects of a complex, all-embracing situation of economic distress which includes the energy sector just as it does the foodstuffs sector and demographic growth, as the basic components of all economic and social development and which, in the economic realities of today, can no longer be looked at in isolation.

The **Commission of the European Communities** looks at the energy situation and the problems of the associated partner countries in a spirit of solidarity and also in accordance with the dictates of sheer necessity. The Commission fully realizes that the energy problems are the result of the increases in the price of crude, the phenomena arising as a result having in many cases become the cardinal problem in the economic and social development and the future of the associated partner countries.

At the beginning of October 1974 the Council of Ministers of the European Communities gave its consent to the payment of 150 million dollars as part payment of a total sum of 500 million dollars which the European Community intends to put into a **United Nations** emergency fund and which, as such, is intended as first aid for the 25 countries worst affected by the oil price increases. Of the first instalment of this total sum, 120 million dollars were placed directly at the disposal of the

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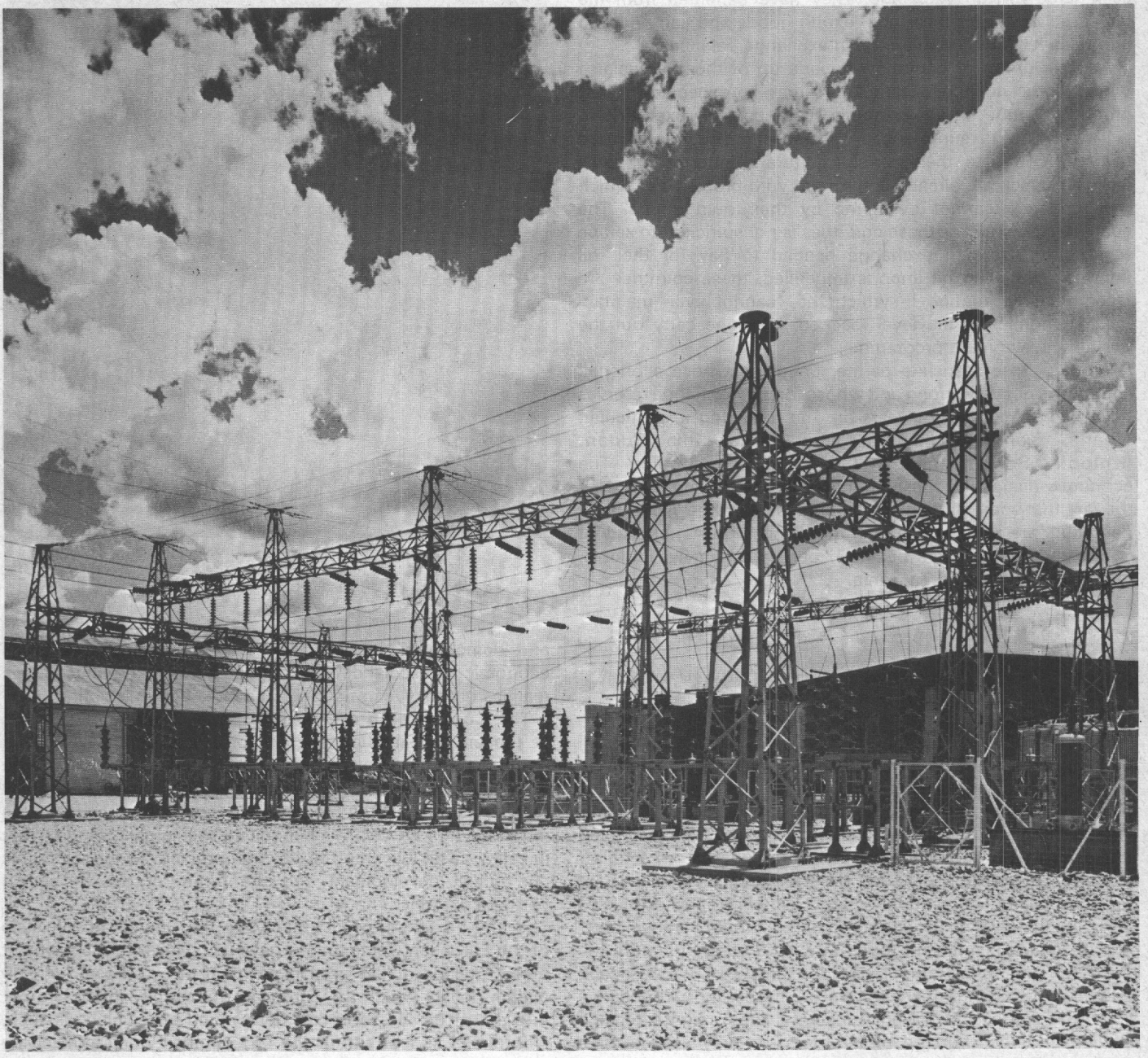
countries affected. The remaining 30 million dollars will be distributed via a special UN fund. This will be supplied in addition to the funds made available by the European Community, with equal amounts from other industrial states and the O.P.E.C. countries.

The Community is of the opinion, rather, that the vicious circle can only be looked at in an overall context and that a joint solution can be contributed to by means of world wide efforts.

The problems on the road ahead are doubtless considerable. However, the opportunities presenting themselves as a result of cooperation by all the groups of countries concerned in these questions should not be overlooked either. The problems and the possibilities of the developing countries represent a challenge to the combined efforts of the economies of the industrial countries and the financial possibilities of certain oil-exporting countries. ■

G.F. EICH



Production and distribution of electricity: a basic industry.

The A.C.P. and the oil crisis

by Franco NICORA

Since the Teheran decision of December 22, 1973, there has not been much detailed comment on the effect of the higher oil prices on developing countries. There have of course been various general remarks and summary statistics; but little has yet been published about the impact upon the poorer countries, which include many of the countries associated with the Common Market, and others in Africa, the Caribbean and the Pacific.

It is a known fact that the developing countries which are importers of oil products will have to pay an extra $ 10 000 m for their supplies in 1974. This is equivalent in amount to the total public aid provided in 1973 by all the industrial countries of O.E.C.D. ($ 9 415 m). The figure is often compared with the additional resulting credit to the payments balances of the Organisation of Petroleum Exporting Countries (O.P.E.C.) as an indication of the change which has now occurred in the very concept of the Third World.

The aim of this article is to get behind the total figures and into the realm of specific realities. The first question is how the extra cost incurred since Christmas 1973 has affected individual countries and major groups. The next is how the A.C.P. countries have fared, both as a group and individually.

It has been suggested that since the developing countries are only slightly industrialised, their energy requirements are comparatively small, and the higher prices for oil are less important to them than they are to industrial countries. It is certainly true that the smaller a country's industry the less are its energy requirements. Some commentators have even suggested, rather precipitately, that the developing countries might thus be able to economise on their transition to the stage of becoming a consumer society.

Whatever intellectual solace some people may find in this, it is no substitute for at least a summary assessment of the impact, and the different way the countries are affected and have reacted. The important factor is not the quantity of oil involved, but the effect its higher price may have on the nascent industries in countries where the economic structure is extremely weak.

We propose to examine the impact of the oil crisis on the A.C.P. from this angle. The short, medium and long-term effects require separate discussion, as to the various measures—international and other—for dealing with it.

IMPORTANCE OF THE IMPACT

Early in 1974 a number of calculations were made preparatory to the steps taken by the Community to help eliminate the effect of various international price changes upon the countries most affected by the crisis. These calculations related to over 70 countries which are net importers of oil products (1). They were aimed in the first place to estimate the effect on the trade balance of the rise in oil prices alone (see table 1).

The figures show that the total imports of oil and oil products into these countries in 1974 can be estimated at around $ 14 000 m, of which nearly $ 9 000 m can be ascribed solely to the rise in prices between 1972 and January 1974 (2). Of the latter total some 45 %, or $ 4 000 m, is the additional cost sustained by Asia and Oceania and another 35 % (or $ 3 000 m) by Central and South America. The figures include an additional cost for India of $ 900 m, South Korea $ 1 200 m and Brazil $ 1 300 m.

The A.C.P. countries comprise 34 out of the total sample of 73 countries, but they account for only 12 % of the total additional cost, or around $ 1 100 m. This is of the same order

(1) A.C.P. countries not included in these calculations were:
— oil producers—Nigeria, Gabon, Trinidad and Tobago and Barbados;
— owing to lack of statistics: Bahamas, Fiji, Granada, Guinea-Bissau, Tonga and Western Samoa.

(2) The average f.o.b. (Arab light Ras Tanura) for crude in January 1974 was $ 7.80 per barrel. Allowing for shipment costs this is equivalent to about $ 9 per barrel cif european port. The f.o.b. price of crude, which was around $ 1 in 1970 rose to $ 1.40 in the following year, $ 1.60 in 1972 and an average of $ 2.15 in 1973 and $ 7.80 in the first quarter of 1974.

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of magnitude as the extra cost estimated for the eight countries of the Mediterranean and the Near East (1), which amounts to nearly $1 000 m.

The A.C.P. countries are shown in the figures as bearing a comparatively small part of the immediate effect of the crisis; but this is no matter for surprise, since the share is roughly proportionate to the population and economic status of the countries concerned. The effect of the shock, however, depends on a country's capacity to withstand it; and, though it has differed from case to case, it is by no means negligible.

It will be seen below that the impact has been offset, and in some cases more than counter-balanced, by the changes in other foreign trade items; but even if we limit our survey to the immediate effect of the higher price of oil, we find an important part has been played by the diversity in the geographical and economic conditions in the various countries.

On the **geographical** side it is almost a paradox that the countries which are worst hit are those usually considered specially favoured by their ease of access to the sea. For them the rise in the f.o.b. prices for oil has affected a larger portion of the c.i.f. price of their imports, than has been the case for countries less well situated. In Togo, for example, the five-fold rise in the f.o.b. prices for crude is reflected in a rise of about 120% in the c.i.f. prices of refinery products; but in Upper Volta 600 miles up-country from the coast, the corresponding rise is no more than 50%. In the same way the countries of East Africa and the Caribbean, where freight conditions are favourable, are similarly penalised (2). The case of Jamaica is a good illustration: in 1969-70 the average price of imported crude was $7.80 per ton, compared with $17.50 for the Ivory Coast and $13.50 for Tanzania. In 1974 the same rise multiplies the price of imported crude in Jamaica by 4.8, whereas for the Ivory Coast the corresponding figure is 3.1 and for Tanzania 3.6.

Economic conditions in the individual countries were and still are another important factor affecting the reaction to the rise in oil prices. Determinants were such elements as transport activity and business conditions in general, the rate of growth and the scale of industrial development. Here again—provided we still limit our survey to the impact of higher energy costs—the **trend has run against those countries who were formerly considered best placed in their economic growth.** It is easy to see, for example, that the effect must be worse in the Ivory Coast, which imports (1972) 180 kg of oil products per head per annum, than in Togo where the corresponding figure is 50 kg, or Upper Volta where it is no more than 10 kg (3). The impact is the more severe in a country such as the Ivory Coast, which has its own refinery capacity and thus bears the full brunt of the fact that crude oil prices delivered Abidjan were multiplied by 3.1 between 1972 and 1974, whereas the multiplier for imported products was only 1.8.

(1) Cyprus, Egypt, Jordan, Morocco, Syria, Tunisia and Turkey.

(2) Of the $1 100 m supplementary oil bill for the A.C.P. as a whole, nearly $500 m, or 45%, falls upon the countries of East Africa (including Madagascar, Somalia and Mauritius), $330 m (30%) is borne by West and Central Africa and no less than 25%, or $270 m by the only two A.C.P. countries in the Caribbean—Guyana and Jamaica—included in the sample.

(3) Imports in 1972: Ivory Coast (net) 950 000 tons; Togo 105 500 tons; Upper Volta 55 000 tons.

Table 1

Effect of the rise in oil prices 1972-74 on trade balances of developing countries (66 countries including 34 A.C.P.)

	Oil bill 1969/70 (av.)	Oil bill 1974	
		est. at 1974 volume	of which: due to price rise 1972-74
	(million dollars)		
1. **Tropical Africa**	**331**	**1 380**	**819**
West Africa	84	376	231
Central Africa	62	193	95
East Africa	185	811	493
A.A.S.M.	**130**	**492**	**277**
Associable countries	**201**	**888**	**542**
2. **Central and South America**	**797**	**4 649**	**3 080**
Associable countries	**41**	**360**	**274**
3. **Asia and Oceania**	**791**	**6 065**	**4 000**
4. **Mediterranean and Near East** (excl. O.P.E.C.)	**308**	**1 561**	**986**
5. **Total**	**2 227**	**13 655**	**8 885**
6. **A.C.P. total**	**372**	**1 740**	**1 093**

Thus, the shock to the system caused by dearer energy products considered by itself has been accentuated or moderated in individual countries through their geographical location and their level of development; but it has been severe enough everywhere to set up a disturbance, and in some cases it has been dramatic.

This can be seen in Upper Volta which, from the arguments outlined above, might be thought to have been one of the countries least adversely affected. In practice the extra cost of oil products imported in 1974 was 1% of the G.N.P. in 1972 and 15% of the total value of exports and 5% of the imports in the same year. The effect is the worse for the fall in exports because of the drought, and the total imports of oil products in 1972 (the total, not merely the additional cost) were about 8% by value of the total imports into the country.

The extra cost by itself is 15% of the annual receipts by way of external public aid, and more than 1 1/2 times the total budget expenditure in 1971 for the rural economy, covering agriculture, stock-raising and rural engineering.

These direct effects on the balance of payments are only part of the story. The indirect effects are felt in many fields, such as rising costs for transport, energy distribution, agriculture (especially irrigation and drainage pumps). They are felt, too, in the administrative departments connected with economic development, such as the education and popularisation campaigns in agriculture and stock-raising; and they are felt in the public finances, especially in the subsidies needed for first-necessity consumption items, and in functional costs in general.

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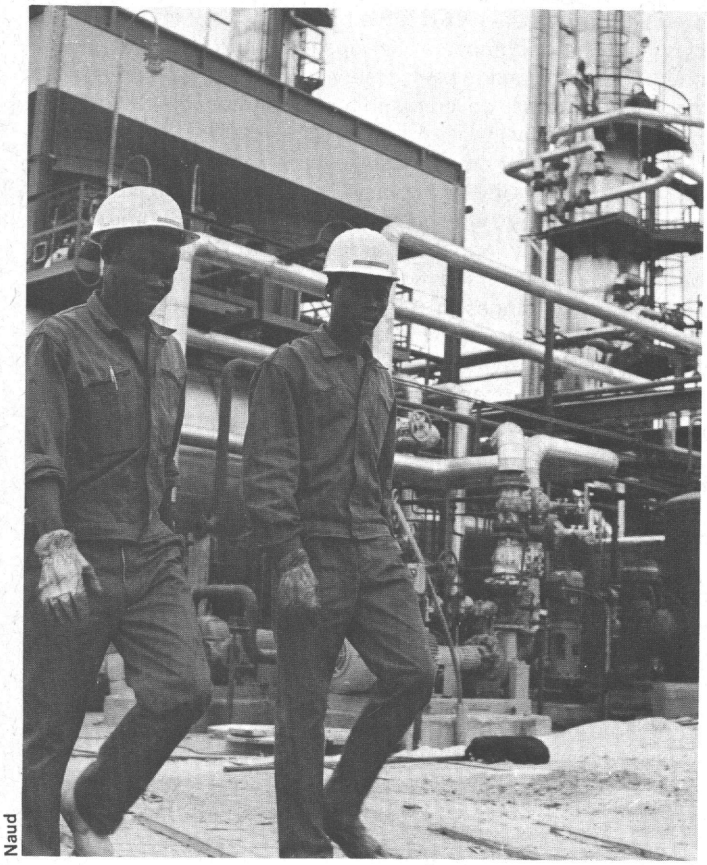
REACTION AND ADJUSTMENT CAPACITY

Just as the severity of the impact differs from country to country, so also does the capacity to react and make the necessary adjustments. One of the important factors in this is the structure and composition of a country's external trade.



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Gabon's oil production is on the up.

Even if we are considering only short-term effects and the balance of payments problems, we still have to remember that the sudden leap in the prices paid for oil was really only the most spectacular event in a much more widespread price movement which has completely upset the former structure of comparative world prices. The movement began in 1968-69 and gathered momentum during 1973.

In the developing countries it affected the imports which had also suffered from the inflation exported by industrial countries in the prices of their manufactures; and it also affected their exports (1) through the very diverse changes in their terms of trade from 1973-74 onwards.

Most of the studies which have been made of this phenomenon draw a distinction between three broad types of situation: (2)

❶ The rise in import prices has been offset—at any rate for the time being—by increased receipts from the export of basic products which have had a considerable price rise over the past year. In most of these cases the gain looks to have been somewhat precarious; but the fact remains that world price expectations over the next year or so provide a certain respite, which can be used for setting on foot the necessary adjustments.

❷ The developing countries in the second type of situation have suffered a considerable deterioration in their terms of trade, but possess resources of their own which can absorb part of the impact, so that the process of adjustment can be spread over a period, either by borrowing or by drawing upon exchange reserves.

❸ The countries in the third type of situation are those for which a very considerable rise in the cost of imports is not offset by higher export receipts, and which lack financial resources capable of absorbing it.

The latter is the worst type of case, and indeed the most dramatic; for quite apart from the payments imbalance, the question which arises is that of **survival pure and simple.** The countries in this class are almost all among the poorest of the developing countries.

It is for the benefit of these countries that international solidarity has taken the form of the United Nations Emergency Operation, to the launching of which the European Community made an outstanding contribution dating from the spring of 1974.

The above classification is only an outline; but it is important to see how the A.C.P. stand in relation to it.

A.C.P. countries predominate in the third group

The outstanding fact is that A.C.P. countries predominate in the group of countries to which the third type of situation applies.

In September 1974 the Secretariat of the UN Emergency Operation published a list of the 32 M.S.A. (most seriously affected) countries; and 19 of them, or about 60 % in number, were among the A.C.P. Their share in the total is also seen to be considerable. For these 19 countries the residual deficit (3) in 1974 amounted to nearly $ 700 m, or about a third of the total which was estimated at about $ 2 300 m. Out of this total India alone accounts for $ 820 m; and the share of the A.C.P. is far more than proportionate to their population and economic importance, or to the proportion of the total impact taken by

(1) Price indices (1972 = 100) in the 1st half of 1974 (average):
— imports: rice (410); wheat (220); sugar (290);
— exports: phosphates (350, rising to 525 in July 1974), rubber (250); cotton (125); palm oil (280); cocoa (340).

(2) To which must also be added the situation of countries which have enjoyed a definite improvement in their terms of trade on a reasonably assured basis (i.e. exporters of oil, phosphates and various other products).

(3) The residual deficit is the deficit in the current payments balance, less the net contribution of public and private capital.

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all developing countries through their oil imports which, as shown in table 1, was 12 %.

Moreover, nearly half the total number of A.C.P. countries figure on the M.S.A. list. This is a much higher proportion than applies to developing countries as a whole, including the countries in the Asia and Oceania group (see below).

Reasons for this predominance

Except for Guyana all the A.C.P. countries on the M.S.A. list are countries in Africa; and it may well be asked, what specific reasons account for their predominance in this classification. The explanation may lie in the oil crisis itself; in changes in their terms of trade and/or physical quantities produced and exported; or in their meagre borrowing capacity and exchange reserves. Some indications about this are to be found in a comparison between the U.N.E.O. estimates made for the purpose of identifying the M.S.A. countries and the scale of the uncovered financial requirements, with the calculations which had previously been made the E.E.C. Commission for a somewhat different purpose during the first quarter of 1974.

The U.N.E.O. estimates were made in terms of the actual payments balances, but the Commission calculations were intended at the time as an evaluation of the comparative effects on trade balances rising exclusively from the 1972-74 price rises:

— of imported goods (using 1972 quantities and excluding oil products) and on exported goods (1972 quantities);

— specifically on the imports of oil products.

In other words the Commission investigation sought to see, country by country, whether any improvement in trade balances due to changes in the terms of trade was or was not sufficient to offset the increase in the 1974 oil bill, exclusively due to the rise in prices; and on the basis of these figures, to estimate the resulting surplus or deficiency.

An analysis of these calculations is shown in table 2 below covering 67 countries (1).

The table shows the size of debit and credit balances, and whether the change in the terms of trade does or does not offset the additional cost of oil imports. The information is classified in geographical groups showing the number of countries concerned in each case; and the classification is made for all the countries covered and for those in which the resulting balance is negative.

This approach of course was never regarded as sufficient for an appreciation of the financial or the true impact of the general crisis by which most developing countries were affected. The only influence studied was that of the price rises, based on average trade figures for 1969-70 (2) and leaving aside interim changes in the structure of the external trade of the countries concerned and in the volume of goods imported and exported (3).

The approach adopted for purposes of table 2 was only partial, but it serves to supplement the results given by U.N.E.O.

(1) Table I above covered 74 countries, including 34 A.C.P. For seven of these including three A.C.P. (Botswana, Lesotho and Swaziland) there are no sufficient statistics, so that they are not included in table 2.

(2) In the case of Togo, for example, 28 % of the exports in this period consisted of phosphates, while cocoa and coffee represented 35 % and 27 %, respectively. In the interim the structure changed, partly as a result of price movements and partly through the physical volume of the goods exported in 1974. The estimated structure of the trade at present is phosphates 62 %, cocoa 24 %, coffee 10 %.

(3) This had a very big influence on countries which were victims of the drought. The improvement in their terms of trade gave them no help because they were unable to take advantage of the opportunity.

Table 2

Trade balances of developing countries

Region	A. All countries covered				B. Countries showing negative balance			
	Change due to terms of trade $ m	Effect of rise in oil prices $ m	Net change $ m	Number of countries	Change due to terms of trade $ m	Effect of rise in oil prices $ m	Net change $ m	Number of countries
1. Tropical Africa	**+1 986**	**−797**	**+1 189**	**29**	**−51**	**− 352**	**− 403**	**11**
• West Africa	+648	−231	+417	12	−13	−7	−20	2
• Central Africa	+347	−95	+252	7	−2	−22	−23	2
• East Africa	+991	−471	+520	10	−36	−324	−360	7
2. Central & South America	**+3 622**	**−2 744**	**+878**	**17**	**+668**	**−2 010**	**−1 342**	**8**
Jamaica and Guyana	−72	−274	−346	2	−72	−72	−346	2
3. Asia and Oceania	**+556**	**−3 708**	**−3 152**	**13**	**−2 302**	**−2 534**	**−4 836**	**8**
4. Mediterranean and Near East (excl. O.P.E.C.)	**+432**	**−986**	**−554**	**8**	**−298**	**−817**	**−1 115**	**6**
5. TOTAL	**+6 596**	**−8 235**	**−1 639**	**67**	**−1 983**	**−5 713**	**−7 696**	**33**

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in drawing up the M.S.A. list. It provides useful indications for a closer appreciation of the problems arising for the A.C.P. countries.

A study of the figures in table 2 gives rise to two main observations:

— changes in the terms of trade for goods other than oil seem, in general, to have had a less adverse action for A.C.P. countries than for other developing countries;

— among the A.C.P. countries showing a negative net balance (i.e. for which the combined effect of the oil crisis and changes in the terms of trade was adverse) the countries of East Africa and the Caribbean (Guyana and Jamaica) suffered more severely than the others.

The second of these observations can be seen clearly in the table and requires no comment. It should be noted, nevertheless, that out of the $346 m negative balance for A.C.P. countries in the Caribbean, the share of Jamaica is no less than $313 m, or 80% of the total. On the other hand, the real balance of payments prospects for this country, its capacity for indebtedness, the scale of its currency reserves and its comparatively high income per head, suggest that its adjustment problems may be less difficult to deal with than those of other countries.

Referring to the first of the observations above, a further breakdown shows that the A.C.P. taken together show an improvement in the terms of trade which amply compensates the negative effect of the rise in oil prices, and leaves a net credit balance of $850 m (1). For the developing countries as a whole, the overall balance is negative ($1 600 m), though this results from the offsetting of considerable balances between credit and deficit countries, and includes a net credit item of $6 500 m resulting from improved terms of trade.

If we consider column B in the table, which shows only the countries with a negative net balance, we can add two further comparisons to our initial observation:

— the proportion of countries in this group is less high for A.C.P. than for developing countries as a whole. It includes 13 A.C.P. countries out of 31, or about 40%; whereas for all the developing countries it includes 33 out of 67, or nearly 50%, and eight countries out of 13 (about 60% of the countries) in the Asia and Oceania group;

— the deterioration in the terms of trade, as affecting the negative balance, seems to have played a less important part for the A.C.P. than for the other developing countries. It accounted for $123 m out of a total of $749 m, or about 16%; whereas for all the countries under heading B, it accounted for $1 983 m out of $7 696 m, or 26%. This is further confirmation, if any be needed, of the considerable influence of the rise in the prices of imported oil for many of the A.C.P. countries.

In other words, and this brings us back to the U.N.E.O. estimates, the factors which **might have had** a favourable influence for many of the A.C.P. (i.e. for comparative improvement in their terms of trade for products other than oil) did not in fact have any **really** positive effect on the **actual** course of external trade as it in fact happened. This was due to falls in production and exports, because of the drought and for other reasons; and a considerably bigger volume of imports, especially of food and equipment items.

On the other hand, the factors which might have been expected to act adversely for the A.C.P. did in fact play their full negative part. These include the rigidity of oil imports and the lack of substitutes; the low capacity for indebtedness and small exchange reserves.

In this respect table 3 below gives rather a striking picture of the difference between what might have been and what was.

The table is based on lists of comparable countries (2) and shows the difference for developing countries of listing under the "price rise" criterion (table 2), by comparison with the "residual deficit in payments balances" as used for M.S.A. countries by U.N.E.O.

There are fewer countries in the M.S.A. list than result from the price rise criterion, but there are more A.C.P. countries, and these are the only developing countries in the analysis to which this applies. The fact is specially marked in the case of the west african countries.

(1) It will be recalled that the A.C.P. countries covered do not include the net exporters of oil products, such as Nigeria, Gabon, Trinidad and Tobago and Barbados.

(2) The list of M.S.A. countries used in table 3 (column 3) includes only 27 of the 32 countries mentioned. This is because five of them (Guinea, Haïti, Lesotho, the Peoples' Republic of Yemen and the Yemen Arab Republic) could not be studied under the price rise criterion through lack of statistical information.

Derrick on an oil prospecting rig in the sea (Gabon).

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Table 3

Developing countries—difference in classification by "price rise" and "residual deficit" criteria. (Number of countries).

Region	All countries covered (1)	"Price rise" criterion. (see table 2) (2)	"Residual deficit" criterion. M.S.A. list (3)	Difference (4) = (3) − (2)
All A.C.P. countries	**31**	**13**	**19**	**+6**
• West Africa	12	2	9	+7
• Central Africa	7	2	3	+1
• East Africa	10	7	6	−1
• Caribbean	2	2	1	−1
Central and South America	**15**	**6**	**2**	**−4**
Asia and Oceania	**13**	**8**	**6**	**−2**
Mediterranean and Near-East (excl. O.P.E.C.)	**8**	**6**	**—**	**−6**
TOTAL	67	33	27	−6

It will be noted, too, that the change in classification does not greatly alter the rather adverse position of East Africa. The M.S.A. list contains six of these ten countries, which is proportionately rather less than the nine west african countries out of 12; but it is materially higher than for the developing countries as a whole (27 out of 67) which includes six of the 13 countries in the asian group. In addition the amount of their total residual deficit puts them at the upper end of the A.C.P. list, with $ 310 m out of $ 700 m, or about 45 %, whereas they are only a third of the number of A.C.P. countries in the M.S.A. list.

* * *

The effect of the oil crisis by itself has, as we have seen above, differed from one A.C.P. country to another because of economic differences and differences of location. For some of them the rise in oil prices was superimposed on other difficulties; but we have seen that its general impact was much the same as for other developing countries which are net importers of oil products.

To get a better view of the capacity of A.C.P. countries to resist the crisis and adjust themselves to it, the effects of the oil crisis were analysed in the wider context of the rise in world prices, and of the financial potential of the countries themselves, including the effective volume of their exports and imports, the volume of their indebtedness and their capacity for incurring it. When the condition of the A.C.P. countries is viewed from this angle and despite the factors which might have operated, but which have not in fact done so, it appears in a **particularly adverse light by comparison with other developing countries,** with the specific exceptions of India and Bangladesh.

In the short-term the various manifestations of international solidarity—including the UN Emergency Operation to which the Community has given substantial support—should partly allay the difficulties which these countries are having in securing the necessary financial adjustments.

Any survey of their position, however, must include an estimate of how they will be placed in the medium and longer term in the new international context.

MEDIUM AND LONGER-TERM OUTLOOK

In view of the many factors which have to be taken into consideration, and the rather hazardous assumptions which have to be made about each individual country, this calls for a cautious approach.

This applies in particular to some of the external factors, including the growth prospects for industrial countries, and their influence not only on the quantities which developing countries are able to export, but also the prices paid for them and thus the future swings in the terms of trade. Among other relevant factors are the extent and character of external public aid and the movement of private capital.

On the other hand there are a number of factors which seem to be within the scope of the future effort the A.C.P. countries will have to make. This applies particularly to the exploitation of oil and other sources of energy of which some of the countries have far from negligible reserves. Other relevant factors include the diversification of their exports and an increase in the production of food products in substitution for imports.

Here, too, the prospects vary from one country to another. Allowance will have to be made for this in the use made in different countries of the various instruments of the cooperation agreement currently under negotiation between the A.C.P. and the European Community countries.

Whatever be the differences between the individual countries, it is understood that most of the proposals now under discussion contain the means of attenuating, for most of the A.C.P. countries, the more disturbing and the more compelling consequences of the new economic order which has come into existence since 1973.

This applies with special force to the proposal to guarantee an important part of the export receipts of these countries and to organise Community public aid on a five-year basis. These items constitute a double guarantee against some of the external factors mentioned above. The same applies to other proposals, such as technical and financial cooperation, which are easily adaptable and can contribute to many types of intervention. This should be a significant contribution to the work most of the A.C.P. countries will have to undertake fo themselves in setting their present economic structures on a wider and more diversified basis. ■ **F. NICORA**

Independent electric power units in Africa

by Marcel TOUSSAINT (*)

This article is a clear presentation of the great possibilities for electricity production in Africa from independent generating units. One of the most interesting points lies in the estimate of operating costs and the practical character of the techniques described, which seem specially well adapted to African conditions.

Even though electrical production in African countries is making rapid strides, it will be less than is needed for long years to come, and will be kept mainly for big industrial undertakings and big urban centres.

Electrical transmission lines cost a lot of money. It is estimated that the transport over 500 km of 150 kW costs 50% more than building a power station of the same rating. Standards of living are not high enough to make it profitable to distribute electricity through the countryside.

In these conditions it was to be expected that, in preparing the Dakar Conference of June 1974, UNESCO should rank the development of independent electric generators among the techniques of priority importance for Africa.

In this article it is proposed to review the present-day possibilities for **producing small quantities of electricity** between 100 Watt-hours per day (which would cover supplies for a few fluorescent tubes) and a few kW hours.

The potentialities will be considered in three groups:

— advanced techniques;
— soft techniques;
— the use of thermic motors.

ADVANCED TECHNIQUES

Chemical batteries are well known for their usefulness in producing small quantities of power, but ruinously expensive for any extended use.

Batteries for domestic use, for example, are marketed at prices equivalent to FF (1) 400 per kWh. Industrial batteries are less costly; but even so, the longlife (2 000 hours) batteries used for the educational television receivers in Niger and the Ivory Coast work out at about FF 40 per kWh.

Any such cost is outside the range of a private buyer. By way of comparison, the small consumer in France buys his kW-hour for a little over 60 centimes.

Solar generators are a better buy, provided they are considered in the long term. They consist of a panel of silicon cells which can directly transform the energy of solar radiation into electricity; a battery (which is necessary if the electricity is to be consumed outside the hours of sunshine); and a charge regulator. They last for 10 years or more.

The current price for such a panel is FF 15 000 per sq.m. of surface. The average solar energy received per day on a square metre of panel surface in Niger averages 5.5 kWh. Since the overall efficiency-yield of a generator is 6.5%, the average cost of a kW-hour is over FF 20. The figure is high, but it may well be reduced considerably if the sun cells are put into mass production during the next 5 or 10 years.

Thermo-electric generators use the principle that a a junction of two different metals submitted to a rise in temperature is the seat of an electromotive force.

Electric energy, however, is only produced with an acceptable yield if the temperatures used are rather high. Economically it is scarcely any use heating the converters by merely exposing them to the sun. It is necessary to use heat produced by other means, such as gas burners.

The apparatus available on the market is very effective, but its current price range limits it to industrial use.

Mention should also be made of thermo-ionic generators and fuel batteries, but their cost/performance ratio is even less adapted to the uses contemplated.

We must therefore conclude that the new techniques have not yet disclosed any miracle solution for the electrical under-equipment of the African interior.

THE SOFT TECHNIQUES

This description has been used for techniques which do not resort to any complex industrial process and which use cheap equipment which can be made and maintained by users themselves or local craftsmen.

Some people may regard these possibilities as a step backwards into earlier history. There is nothing surprising in this, for the aim from the first is to use cheap labour instead of expensive investments, which is just the opposite of the trend

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(*) Director of studies at EUROSPACE (European Industrial Group for Space Studies), Paris.

(1) $1 = FF (French Francs) 4.54.

in our mechanical civilisation. It must be noted, too, that even the most traditional techniques have been greatly improved through the accumulated thought which has been put into them in recent decades.

Muscular energy, the most traditional source of effort, is far from being obsolete, whatever people may think. A man on a bicycle can, without excessive strain, develop a force of 40 Watts for 8 hours. A horse harnessed to a threshing mill develops 10 times as much.

If the power thus produced is used to work a dynamo or charge a battery, the efficiency ratio will be around 65 %, so that the cyclist will be able to produce 240 Watt hours per day at a very small cost.

The price of the equipment, consisting of bicycle, generator and battery bought in Europe, is around FF 500. Giving it a 5-year life the cost per kW-hour is under FF 1.50.

Muscular energy can thus be used to produce electricity in useful quantities at quite an acceptable price without any need for investments, but only provided cheap labour is available.

Wind power is still more interesting, at any rate in some regions.

The standard formula is that the power picked up by a windmill is proportional to the surface swept by the sails and the cube of the speed of the wind. At present a power of 20 Watts per sq. m. can be picked up with the wind at 18 kmph, and the use of small aerogenerators, of 5 kW or more, is considered worthwhile, provided the average annual wind speed reaches this figure.

For lower wind speeds the yield is less good. Some types of mill marketed in Europe produce power when the wind reaches 7.2 kmph, but the energy produced is small (2).

On the map (fig. 1) the average annual wind speeds are shown at some of the African stations. It is clear that there is no useful application for aerogenerators in Central Africa or most of West Africa. On the other hand, on the east coast and in southern Africa conditions are different; and in southern Africa indeed, more than 80 000 mills are currently in operation.

The price of material as sold in Europe is rather high, for they use the best materials and have automatic protection systems. The full equipment, consisting of a 100 Watt aerogenerator with control panel and battery would work out at over FF 10 000. As regards Africa, however, we cannot draw any conclusion from these figures.

It is quite possible to make a windmill from the spare parts of a car, or even a bicycle, and several magazines have published diagrams for the purpose. The purchase of a generator does not call for any large investment; an alternator for a car costs about FF 300.

By these methods it would seem that wherever wind conditions are good, electricity can be produced at a cost which is not much more than has been suggested for muscular energy.

(2) There is a different problem for mills used for pumping water. These turn more slowly and in general with less power.

Water power also brings in worthwhile resources. It is quite often used in Europe for independent electricity production; and in France several hundred people use waterfalls to make their electricity and sell the surplus into the public supply.

Apart from the engineering work, the investment needed is a turbine and an alternator or dynamo. The cost of a small installation in France works out between FF 3 000 and FF 10 000, but it would be less in Africa, where the turbines (which have an efficiency-yield of up to 80 %) might well be replaced by wheels with blades of wood which could be made locally, even though the efficiency might be as low as 50 % or even lower. In this again, the essential investment would consist of the generators and, if necessary, batteries.

THE USE OF THERMIC MOTORS

The independent units best known nowadays are **electro-generating units.** There is a big range of these fuelled with kerosene, petrol or diesel-oil, and developing powers ranging from a few hundred Watts to some dozens of kW. The main inconvenience is the operating cost.

A small 300 Watt battery charger can be bought for about FF 1 600. Its life, however, is not more than 2 000 hours, and it calls for careful maintenance which includes changing the oil and cleaning the air-filter every 30 hours. Its consumption is 0.4 litres of petrol per hour. The cost per kWh thus works out at about FF 10, three-quarters of which is accounted for by the operating costs. Diesel units are more robust, with a normal life of about 10 000 hours, lowering the cost to less than FF 3 if a unit of 5 kW is used. About two-thirds of this is the operating cost. The price to be paid for a 5 kW diesel unit is of the order of FF 20 000, equivalent to the cost of a solar generator of 65 Watts.

At least as inconvenient in many regions is the difficulty of securing regular deliveries of the fuel used. On the other hand no thermic motor has yet been a successful rival to the piston engine.

Sun-powered motors, or heat-energy from the sun's rays, are used to heat fluid in a thermodynamic circuit, but this is not a solution to the problem with which we are concerned.

The difficulty in this case is the need for using expensive headers and insulators, if it is desired to obtain a circuit with a high temperature difference. The procedure does not seem to be profitable, except for power stations with a high rating. For circuits with a small temperature difference of, say, 30° between the hot source and the cold, they certainly produce small quantities of power, but they are very expensive. A 1 h.p. (736 Watts) solar pump costs over FF 140 000.

At one time there were high hopes for external combustion engines, but in practice they have proved disappointing. The Stirling engine, in particular, has not yet reached the stage of series production.

The most interesting idea put forward so far is to use piston engines, but to replace the hydro-carbon fuels by products

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which cost less foreign currency to obtain and can be produced by the users themselves. Such products already exist.

Among them are vegetable oils, which are already used for some diesel engines. Another is methane, which can be produced easily by vacuum fermentation of refuse, and which is in fact produced in rural China and India. Still more important may be alcohol. The hydrolysis of wood cellulose, for example, yields up to 60 hl of alcohol per hectare, which can be used to produce over 3 000 kWh. In the same way the processing of maize could produce more than 35 hl of alcohol per ha.

The important thing is that these fuels are entirely suitable for present-day engines, subject only to a few minor adjustments. Several European automobile manufacturers are indeed actively engaged on studying this process. It is worth considering whether an information campaign, angled on new ways of using electro-generating units, would not be the most profitable investment for securing electricity production on a decentralised basis.

* * *

One conclusion emerging from this brief survey is that the problem of satisfying the need for electricity in rural Africa does not call for the devising of new techniques, but rather for information campaigns.

The independent generators best suited to African conditions are in fact among the best-known and indeed some of the oldest. Unless the price of the solar cell can be drastically reduced, the rotating field generator—dynamo or alternator—will remain the chief source of electric energy for many years yet. The most effective action which could be undertaken in the next few years would be an information campaign to propagate the principle of this type of apparatus, and suggesting the best ways of using natural resources—the wind, water-power and field and forest products—for bringing it inexpensively into action.

Education is the key to rapid electrification

In other words, rapid electrification up-country in Africa does not depend on miraculous new technologies, but simply on education. The latter of course means **making practical knowledge available in popular form,** supported by the availability of material—dynamos, spare parts for windmills, water-mills and the like—and instructions for building, so that users can themselves build their own electric generators, or get the best value out of their electrogenerating units.

This must not be taken as meaning that more sophisticated sources of electricity are of only minor interest in Africa. The truth is just the opposite. Such sources will play—indeed they are already playing—an essential part. This is, in some sort, a catalyst. Among the most effective means of disseminating practical knowledge now known to us are the radio and, still more, television.

The transistor, using chemical batteries, is of great importance in the remoter parts of Africa. A number of educational television systems have already been set up in various parts of the continent. "Association News" has already published particulars of a project for setting up rural television networks specifically for the education of adults in the African interior (3).

Fig. 1. Average annual wind speeds (km/h) (shaded area offers least possibilities for wind power).

In the early stages most of the receivers in the rural districts can only be powered by chemical batteries or solar generators.

Such sources, however, are expensive; and insofar as the TV programmes are aimed at speeding up the economic development, a criterion of their success will be the rapidity with which rustic power generators, such as have been described above, make their appearance side-by-side with the more expensive ones. Such generators are better suited to the African context and they are the only ones available at a cost within reach of African family budgets.

It is something of a paradox to suggest that the function of up-to-date power generators is to prepare the ground for their more rustic and old-fashioned competitors. If, however, such a procedure speeds up the rise in living standards in rural Africa, the interests of the manufacturers will, in the long run, be the better served. ■

M. TOUSSAINT

(3) See Association News No. 26 (July-August 1974)—"Aesop the African" by Sebasoni Manzi.

British aid for energy

The power needs of developing countries have never been as important as they are today. Plans for the power sector have always formed an integral part of any development plan, but current talk of limited fuel resources and "shock" oil price rises has massively upset the assumptions on which past plans were based. While as yet few clear new power policies have emerged, more consideration is already being given to the possible use of alternative power sources, and exploration to prove the size of fuel reserves.

The first and most urgent need seen by the British Government is for assistance to be given to those developing countries hardest hit by the rapid rise in oil prices. The E.E.C. has agreed to contribute $500 million to the "United Nations Emergency Operations", launched in April this year for countries most seriously affected by the rise in oil and other prices. Britain showed her concern by contributing $47.5 million (£20 million) bilaterally to the Operation even before the other E.E.C. members agreed to release $150 million of the pledged contribution. Mrs. Judith Hart, Minister of Overseas Development said: "I felt that the conditions originally imposed upon the Community contribution should not delay the flow of help to the desperately poor countries hardest hit by the crisis in oil prices, and I was not prepared to have Britain wait any longer."

Alternative power sources (1)

For the longer term the British Government—in common with other Governments and institutions—is showing considerable interest in exploiting and developing alternative power sources. These offer greatest promise for the rural sector where the bulk of people in developing countries live, which in the past has been allocated much aid, particularly related to power projects. In the rural sector, alternative power sources can improve agricultural productivity by helping irrigation; provide better communications; and boost domestic lighting and power for workshops, threshing machines, ginneries and other village industries which help to diversify employment and so raise the standard of living in villages.

It is expected that most research into alternative power sources will be carried out in the developed countries, but the world's aid agencies such as the British Government's Ministry of Overseas Development will be keeping a close watch on progress to see how best new developments and technologies in this field can be applied to assist the developing countries.

(1) Editor's sub-titles.

In judging the success of alternative power sources, different criteria have to be borne in mind from those used to judge more conventional sources. Continuity of power supply, which is regarded as essential in industrial and long established agricultural areas, cannot be taken for granted with these alternative power sources. Although it is desirable to have power available on demand at all times, it may in fact prove to be a question of having a slightly irregular supply—or none at all.

Also relevant are the loads to be supplied, their magnitude and the time of day, or season of the year, when they are most likely to occur; in this way they can be matched with supply to the best advantage. Indeed, an attempt should be made to consider all the likely costs and benefits involved in the project—such as employment and income effects and the possible implication for rural industries of local labour, materials and technology involved in the contribution of equipment for utilizing the local power sources. In this connection the role of intermediate technology in helping rural areas to reap maximum benefit from the alternative power sources is therefore considerable.

The most hopeful areas of alternative power are:

❶ **Solar Energy:** Solar distillations; solar evaporation; solar drying and solar water heating.

These are already the areas in which solar energy is a success in developing countries. With further research and adaptation

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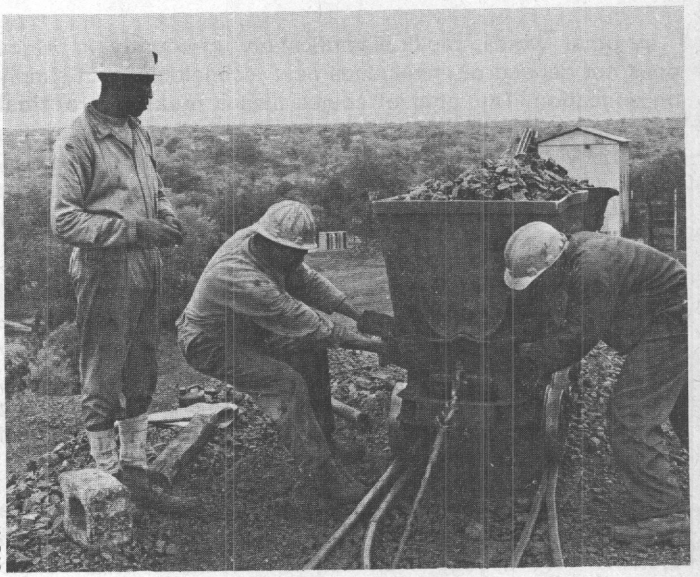
Coal is one of the chief resources of Ngwane (Swaziland). The Mpaka mine (below) is the country's biggest.



C.O.I. — London

to local conditions these applications could become more widespread and different applications such as solar refrigeration, water pumping and cooking could be taken up.

❷ **Geothermal energy:** Where this is available and loads are conveniently located, electricity can be generated at much lower costs than conventional power plants.

❸ **Wind energy:** This still has its greatest potential in direct mechanical applications; mainly water pumping. However, where high winds are frequent small scale generation of electricity is possible in developing countries.

❹ **Energy from waste matter:** This shows greatest promise with regard to the small scale production of methane, but there is need of further research and development, especially bearing in mind local conditions.

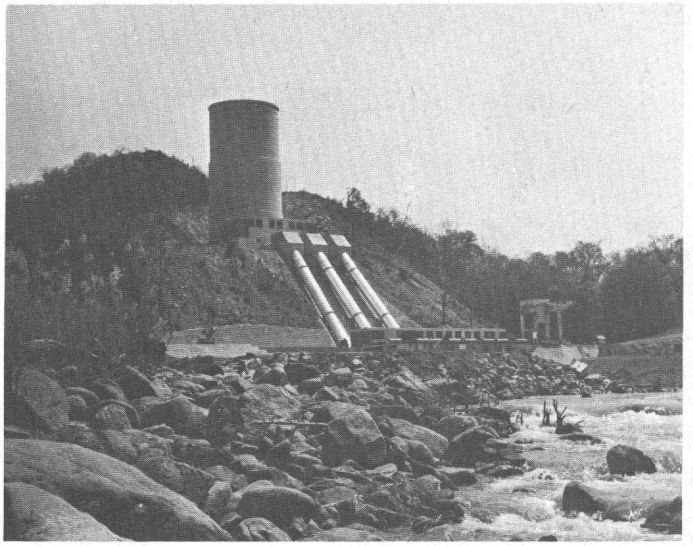
The Ministry of Overseas Development is at present inquiring into possible ways of encouraging the application of alternative power sources. A special section of the Tropical Products Institute, one of its specialist scientific units, has recently been set up to review the economics of alternative energy sources in the developing country context. Further exploratory work needs to be undertaken, particularly into geothermal reserves, and application of intermediate technology to various alternative power projects is required before serious consideration is likely to be given by most Governments and consultants to the widespread installation of alternative power projects.

There are two recent examples of assistance by the O.D.M. in the development of alternative energy sources. At present technical assistance is being given to St Lucia in her attempt to discover the extent of her natural geothermal resources at Soufrière, a volcanic area of the island, with a view to tapping these for electricity generation. Also the Tropical Products Institute has recently been approached by the South Korean Government to design a pilot plant methane digestor for making methane gas from waste.

Various non-governmental organisations in Britain are also working on research into alternative energy sources for developing countries. One of the most important is the Intermediate Technology Development Group, London, which has a Power Panel of scientists looking into the possible uses of solar energy, wind power and the manufacture of methane gas from waste.

More conventional power sources

Although various organisations and Government departments have undertaken and are increasingly undertaking research into alternative power sources for developing countries, the British Government has for many years been helping alleviate energy problems by more conventional methods. Many projects have been looked at over the years and the Government has financed the feasibility studies undertaken to assess their likely success. The principal area of British assistance to the power sector in the past has been that of hydro-electric power. Britain's assistance to the Indus Basin Development project



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The Nkula Falls hydroelectric station on the river Shire in Malawi.

in Pakistan has continued since 1962 until the present, during which period approximately £ 34 million has been spent on inter-related irrigation and hydro-electric power schemes in conjunction with other aid donors. In 1973 Britain made a grant of £ 2 274 000 to the Government of the Seychelles for the design and construction of an arch dam of 170 million gallons capacity at Grand Anse on the main island of Mahe. The Commonwealth Development Corporation, which is financed from Government funds, is lending almost £ 2 million towards the cost of a hydro-electric project in Malawi at Nkula Falls. Britain has also agreed to loan aid of up to £ 500 730 to the Government of Mauritius for financing the purchase and installation of two 6 MW generating sets, together with associated equipment, for the Central Electricity Board of Mauritius. Similarly work is continuing in Guyana extending the generating capacity and for this purpose Britain has agreed to provide £ 3.1 million, with further amounts coming from Canada and the World Bank.

Consultancy services concerning the electricity, water and port services in Gambia were financed under British technical assistance. Two consultancies were financed in Swaziland, one related to a thermal power station and the other concerning coal mining to supply the power station. Technical assistance will continue to be given to Swaziland by supplying staff from the Institute of Geological Sciences to help with research into coal and iron ore deposits and also training will be provided for those whose job it will be to operate the power stations.

The Directorate of Overseas Surveys, one of O.D.M.'s scientific units, has also undertaken several projects concerned specifically with sources of energy. There was a field survey and contoured mapping between 1964-66 of the Pangani River Basin which was to be affected by the new Nyumba Ya Mungu Dam in Tanzania, and earlier D.O.S. carried out surveys into the siting of the Volta Dam in Ghana. It has recently been asked to carry out 1:10 000 contoured mapping of the coal reserves in Ngwane (Swaziland). ■

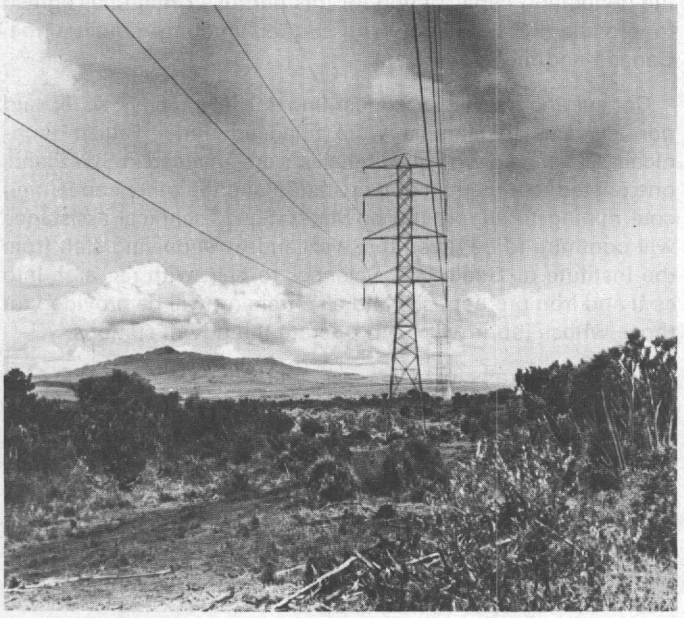
Electricity for Kenya, Tanzania and Nigeria

by Brian SEVERN (*)

By comparison with developed industrial countries, much of Africa has hardly begun to use "fossil" fuels — oil, natural gas and coal—and may not be in a position to start heavy imports of so expensive a commodity as oil now promises to be. What, then, may be the pattern of energy development for these countries, and how may they secure the ample supplies of electricity needed for industrialization and for modern living? This article looks at the steps in development of the electricity industries of Kenya, Tanzania and Nigeria, and considers how in their respective circumstances these countries (and their neighbours) may best assure their future power supplies.

(*) Engineering and Power Development Consultants, Ltd., England.

An example of regional cooperation in energy supplies—electric transmission at 132 KV from Owen Falls (Uganda) to Nairobi (Kenya).



THE DEVELOPMENT OF ELECTRICITY SUPPLY IN KENYA

Kenya has had public electricity supplies for a long time, but until quite recently the pattern of development was of relatively unspectacular growth in size and number of generating stations, and in extent of the distribution system. As would be expected, the two main centres, Nairobi and Mombasa, have been the foci of development with separate systems centred on each, and the more outlying "up-country" plants and distribution networks have mostly operated in isolation, for a good many years at least. With gradual growth in electricity consumption and demand, the two main systems gradually spread to connect with some of the minor systems, and in 1971 the Nairobi–Coast interconnection linked them into a single main network.

The generating plants serving the Nairobi region were formerly small in individual unit size, driven either by diesel engines or water-turbines. During the last fifteen years or so it has been economically practicable to undertake appreciably larger hydro-electric development rather farther from Nairobi, and a succession of medium-sized hydro stations is in the process of construction. This transition corresponded to the growth in interconnected electricity demand—from 20 megawatts in 1950 to 80 megawatts by the mid-1960's, and projected to some 500 megawatts in the 1980's. This growth justifies the energetic development of Kenya's only major water-power resource, the Tana river. Although not large by comparison with the great rivers of Africa, the Tana is capable of sustaining something like 700 megawatts and is a precious asset for Kenya. The coastal interconnection means that, so far as it may be necessary to augment hydro generation by use of fossil fuel, this can be done using the cheaper fuel available at Mombasa, rather than more highly refined oil expensively hauled inland to Nairobi. There can be economy energy interchanges between coast and inland, according to seasonal abundance or shortage of water. The main duties of diesel and gas-turbine units are for standby and peak-load support, and for the technical requirements of maintaining electrical stability in the extensive transmission system.

These policies can be further refined to ensure a large degree of independence of imported fuels until the later 1980's, but by that time other large new plant must be foreseen. Apart from following the majority of other industrialized countries

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into heavy dependence on fossil-fuels—which for Kenya means imported fuels—where else may Kenya seek increased energy supplies? One opportunity which has been usefully applied throughout the last 16 years is the availability of surplus energy from Uganda's Owen Falls hydro-electric scheme, via a transmission line specially constructed to Nairobi. Roughly 40% of the Owen Falls energy output has been transmitted to Kenya each year—a mutually advantageous collaboration. There is only limited scope for increase in output from Owen Falls, if its capacity is increased from the present 120 megawatts to the 150 planned as ultimate, but if a new site were developed downstream this might afford a much more significant increase.

Another avenue still under exploration is the possible application of geothermal energy. In Italy, New Zealand, and California there are generating stations using natural steam from underground. Typically the units are of modest size, and although neither boiler nor fuel is needed the difficulties of developing suitable steam walls and the unusual steam conditions for the turbines imply offsetting costs, both capital and operating, such that the electricity generated may be only marginally more economical as compared to conventional alternatives. Nevertheless where such developments are possible the "fuel" supply is free of continuing import costs and is virtually perpetual. Marked geothermal activity is known in the Rift Valley area of Kenya, near Lakes Hannington and Naivasha for example, but so far no usable steam supplies have been proved. It is too soon to pronounce definitely on the possibility, or possible ultimate extent, of power development from such sources, but it is evident that the best hopes that could be held out might be for a few tens of megawatts by the early 1980's, and possibly larger plants thereafter.

Kenya's electricity industry is unlikely to be large enough to justify entering into nuclear power until around 1990 or later. The first such plant would probably be located at the coast, where ample cooling-water is available. It may therefore be expected that after substantially completing economically practicable hydro-electric development, and until the large step into nuclear power can be justified, Kenya will face an interim of several years increasingly heavy dependence on imported fossil-fuels for electricity generation. The length of this interim must depend greatly on progress in development of economical nuclear power reactors in intermediate sizes. Possibly a bulk sales agreement with Tanzania could justify advancing by a year or two the advent of nuclear power into East Africa.

POWER IN TANZANIA

Early electricity supply developments in Tanzania were widely scattered and may be considered in three categories: the diesel station at Dar-es-Salaam; small isolated diesel and hydro-electric plants inland, and the rather larger hydro developments on the Pangani River near Tanga.

Various local networks spread and interconnected, sufficient to justify increased size of units, and in the late 1960's the Tanga and Dar-es-Salaam areas had about 46 megawatts of developed inter power and about 50 megawatts of diesel units, the latter mostly fairly old. This sufficed for the small interconnected demand, then not much over 50 megawatts, but with the expectation that this would treble within the next decade, larger schemes were obviously going to be needed.

Apart from the Pangani River in the north, Tanzania has substantial possibilities for hydro-electric development on the Wami and Rufiji river systems, especially the latter which is south of Dar-es-Salaam. A 200 megawatt hydro-electric station on the Great Ruaha (tributary of the Rufiji) is due for service in 1975 and there are other sites, some of which could support developments as large or larger. Yet another river for possible development is the Rovuma, at the Mozambique border. At present it is uncertain whether—or when—development there may be politically possible. Nevertheless it is clear than Tanzania will be able to rely on water power for the bulk of her electricity requirements, longer than Kenya. This may make it possible to avoid heavy dependence on imported fuel, especially if Tanzania is in due course able to collaborate with Kenya in the eventual planning for the first nuclear station, in one or other country.

NIGERIA, THE ENERGY GIANT

There are significant differences between Nigeria and most other countries of tropical Africa. Equal in land area to Tanzania, and larger than Kenya, Nigeria is far more populous and thus is in a much better position for extensive industrialization. Ample human resources and a large domestic market are evidence of the means and the motive. A long history of trading, mainly in agricultural or mineral commodities, is now broadening immeasurably with the oil riches discovered and developed in recent years. Not only is Nigeria possessed of all the energy she will need for many years, but of a massive foreign-currency earning export. These same resources can be the feedstock of modern petrochemical industries, producing much that is needed throughout modern Africa. Thus Nigeria can have a trading and exporting strength far exceeding any of her neighbours, and the progress of development should be unimpeded by the financial stringencies which will continue to beset the majority of other countries. Not the least effect of this prosperity will be the advance in her electricity industry.

The early development of electricity supply in Nigeria was much like that of most other parts of Africa—small isolated thermal (commonly diesel) generating stations supplied small distribution areas in and around the larger towns, and since the cost was high, the scale was small. In the Plateau area, small-scale hydro-electric stations were built to operate in conjunction with local diesel plant, to supply the tin mining industry. Excluding the small privately-owned Plateau system, the total Electricity Corporation generating capacity in 1952 was about 24 megawatts, which included 14 megawatts of coal-fired steam plant at Lagos; the rest consisted mainly of scattered, small, obsolete units. From this point on, however, the economics of scale began to have a perceptible favourable influence on cost and it was possible to plan ahead for enlarged steam-plant generation. The Lagos plant was extended by further oil-fired plant, and a new coal-fired plant was built at Nigeria's coalfield near Enugu. These and sundry diesel-plant extensions brought the capacity to over 60 megawatts (disregarding certain obsolete plant) by 1954, and the two main stations were subsequently extended by a further 80 megawatts.

By the end of the 1950's, new horizons were beginning to open. It had been recognised for some time that large hydro-

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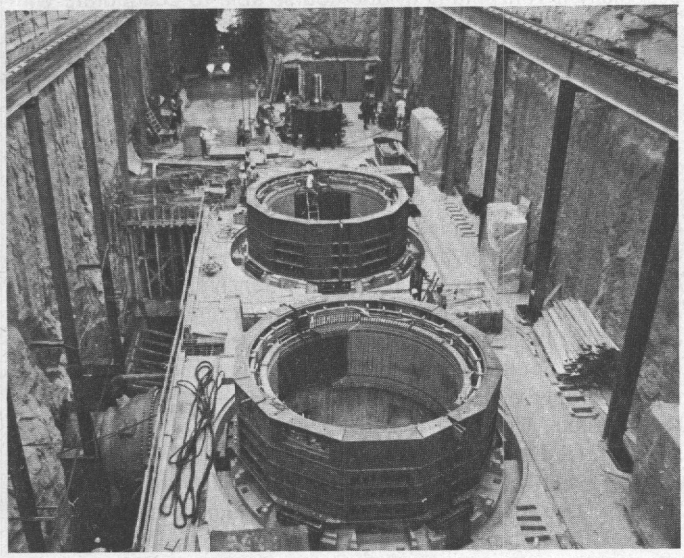
electric potential existed in the Niger river system. However, it was clear that any development of this resource would have to be large—so far, too large to be contemplated. Furthermore, although the major oil finds still remained to be proved, it was becoming clear that large natural gas fields existed in the Niger Delta region. This gas might be used in gas turbines, or alternatively in the furnaces of large steam plants. The take-off point had been reached and from this point large-scale expansion of electricity supply could begin. Although the opportunities were clearly visible, it was important that with such large investments to be made—not forgetting very extensive high-voltage transmission links—there should be careful weighing of the economic strategy implicit in each alternative considered.



Hydroelectric power station at Kamburu (Kenya). Each of the turbine generators has a capacity of 130 MW.

The ingredients from which a selection was to be made and put in the best order included the expansion, maintenance or closure of existing stations; various possible hydro-electric sites (and scales of development) on the Niger and Kaduna rivers; new stations fuelled by natural gas; and various ways of making suitable transmission interconnections.

In the event, the adoption of the Niger Dams Project included the construction of the Kainji dam initially, and defined two other major hydro-electric projects for future years. From the commissioning of 320 megawatts in 1969, Kainji alone provides for 960 megawatts ultimately and so assures the bulk of Nigeria's needs until the 1980's. Within that time the relative places of gas, oil, and the further dams must be resolved within the national economic strategy. It is clear that making prudent use of all these resources in combination, Nigeria can have power at attractive costs for many years to come, certainly up to such time as developed advanced nuclear units are available. Even then, her coal resources will remain available for possible power use. In the meantime, the relative abundance and facility for development indicate that Nigeria can be not only an exporter of sundry manufactured goods and materials but also an exporter of electricity, to some of her smaller or less abundantly-endowed neighbours. Considering the secondary effects of ample and economical power supplies, there is scope for international development having the objectives of "aid" but not necessarily involving Nigeria or the international aid agencies in particularly large long-term financial commitments. Incremental development of hydro-electric projects is not highly expensive after the initial phase. If the timing of later phases of installation can be advanced, the only major item remaining necessary for an export supply may be the transmission lines, and any strengthening of the distribution network in the receiving country. This style of development, of which Owen Falls in Uganda is an early example, can be tailored for mutual advantage whether on a bilateral or multi-national basis. Depending on the future availability of surplus potential from the Volta dam, i.e. on the ultimate requirements for the associated aluminium smelter, as well as other Ghanaian needs, there may be attractions in strong east-west transmission links as the basis of a West Africa transmission network.

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Projections of future consumption of energy resources, and in particular of oil, have been compared with trends in the discovery and development of new oilfields with variously depressing conclusions as to the ultimate exhaustion of all these resources and as to the fuel prices likely during the run-up to such exhaustion. It is true that as supplies of low-cost oil diminish, higher-cost sources will be developed and scarcity will push up the market price of remaining low-cost oil to much the same levels. In this period, already begun, low-cost producers will enjoy large revenues—even apart from possibly more ruthless use of the "oil weapon". In any event, it is transparently clear that oil is no longer a cheap fuel, and even producer nations with "money to burn" may become reluctant to burn too much of their own (non-renewable) "money". Thus the world enters a period of more conscious conservation of its exhaustible resources. All this means that fuel will cost much more, and that fuel-using equipment including power stations must use it more efficiently—and so they too will cost more. All this is part of a world-wide cost-push inflation, to which the mainly agricultural economies of tropical Africa cannot easily adjust.

The general form of development in these circumstances has been outlined above, in the case of the three countries discussed. Usually the problem is one of husbanding limited hydro-electric potential in order to survive—solvent if possible—into the rather indefinitely defined nuclear age. But even large water power schemes are no longer viewed with the euphoria of twenty years ago. We now know how difficult it can be to accommodate a displaced population, in a humane and satisfying way. We have seen how a great new reservoir may facilitate spreading of pests or disease, or may so alter water quality that the outflowing river is drastically affected. Recognition of these risks and of past opportunities missed does not however preclude highly beneficial river developments; it simply means that such enterprises are less commonly to be regarded as single-purpose: never as single-effect. The complex problems of future energy supply in Africa have deep economic and human implications. They will in **some** fashion be solved; it is now of paramount importance that all the needed skills be brought together to apply the expensively-learned lessons of earlier experience. ■ **B. SEVERN**

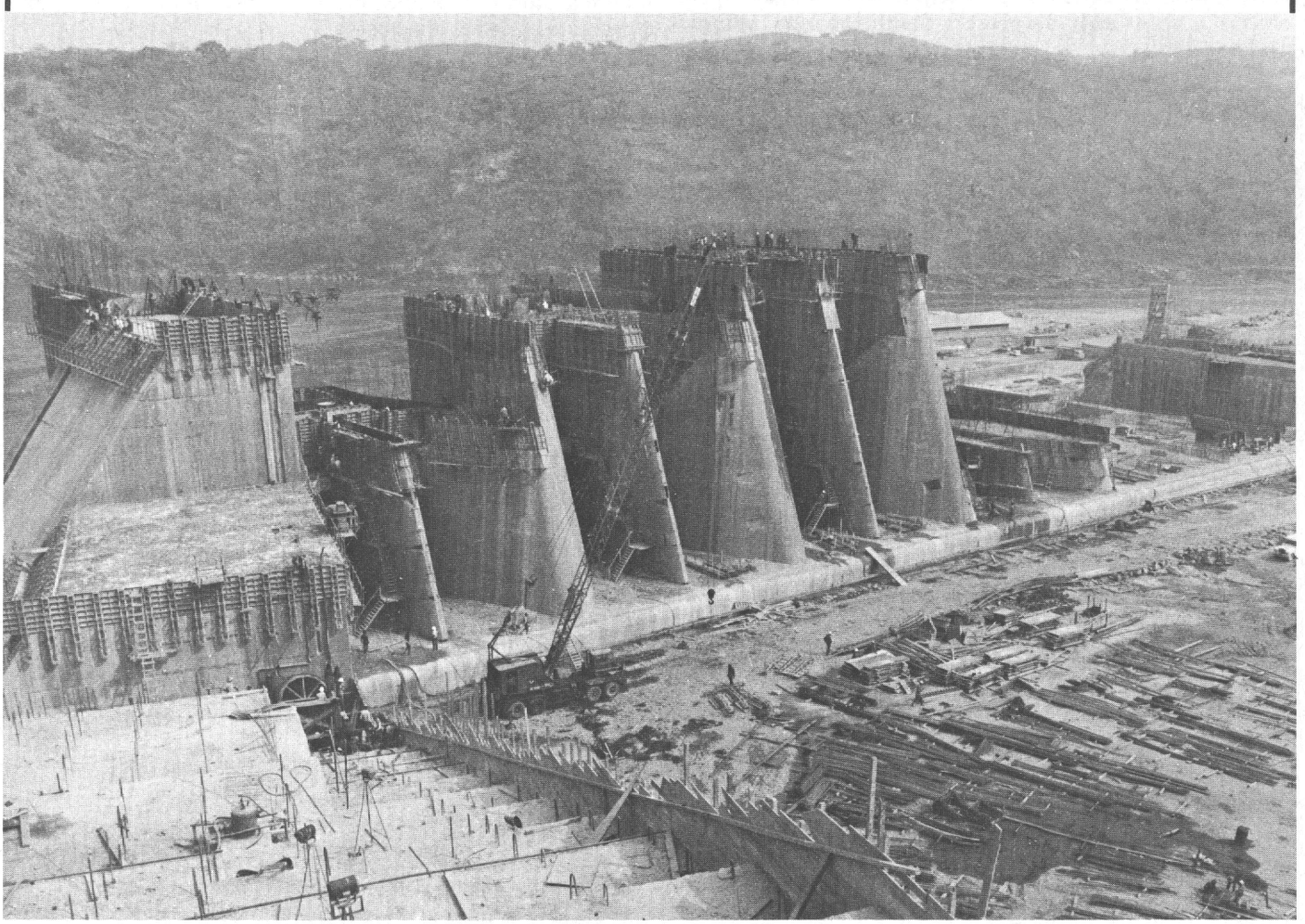
E.D.F. CONTRIBUTION TO ELECTRICAL DEVELOPMENT IN THE A.A.S.M.

Electric power projects in the A.A.S.M. are regarded by the E.D.F. as matters of first importance and the fund has made a significant contribution to improving the organisation of electricity supplies. These projects have included not only the production of electricity under national schemes, but also power transmission and self-production for industrial uses.

Under the first three European Development Funds, finance has been found for a number of electrification projects amounting altogether to 5 650 kVA installed capacity in thermal and hydroelectric stations, 594 km of high-tension and 175 km of medium-tension transmission lines. The total investment, including the surveys, comes to about UA 36 m.

Three specific examples to illustrate the action taken by the E.D.F. are given below. These are:

- **the Inga dam in Zaïre;**
- **the E.D.F. aid to Rwanda under a regional cooperation scheme;**
- **the projected Sélingué dam in Mali.**



AGO 1974

Building part of the Inga dam on the Zaïre river. This single hydroelectric complex has the potential to produce nearly a third of the world's hydroelectricity.

ZAÏRE

INGA: the world's biggest hydro-electric project

by Gérard WINTRINGER

Known sites on the river Zaïre which would be suitable for hydro-electric development, on lines which would be technically and economically satisfactory, amount to a gross theoretical capacity of 103 m. kW, capable of providing effective installations of 40 m. kW. The Inga site by itself, when it is fully developed and equipped, will represent no less than three-quarters of this, an installed capacity of 30 m. kW corresponding to potential gross production of around 260 000 m. kWh, or nearly a third of all the world's reserves of hydro-electric potential. It is a project to stir the most sluggish imagination.

THE INGA SITE

The Inga site is on the river Zaïre, a little above the estuary, scarcely 40 km as the crow flies from the Port of Matadi. It is fed from a catchment area of 3.7 m. sq. km by a river which has flowed for 4 600 km to this point, where, over a distance of 15 km, there is a natural drop of 102 m, consisting of a succession of rapids. At this point the maximum flow of water is about 81 000 cu. m per second. Its special feature is that the minimum flow is as much as 21 500 cu. m per second, so that the ratio of the lowest flow to the highest is as much as 1:4 (1). This very remarkable stability in the amount of water passing is explained by the fact that the river flows on both sides of the equator, so that its tributaries bring in water from the northern and the southern hemisphere in almost equal quantities.

A still more valuable aspect of the Inga site is that it can be developed and equipped in successive phases. This distinguishes it from most other hydro-electric schemes which begin with the need for a complete dam across the river concerned.

Parallel to the river are three separate valleys (see diagram No. 1), one of which is the valley Nkokolo (formerly the van Deuren valley), which was once the bed of the river itself. The site thus lends itself specially well to stage-by-stage development, with the added advantage that the work can be carried out on dry ground.

So by comparison with other projects, the Inga site offers the following exceptional advantages :

— a big and comparatively regular flow of water with a guaranteed minimum estimated at 28 000 cu. m, coupled with a topographical lie making it the only site known in the world offering, in one place, a capacity of 30 m. kW available throughout the year;

— a geographical position in the immediate neighbourhood of a seaport. This advantage is important both for organising the development work and for the utilisation of the power produced;

— the possibility of phased development, enabling the amount of equipment to follow the economic requirements as the pressure of demand increases.

The first stage of the project was mainly designed to cover the normal power requirements of Kinshasa and the Bas-Zaire region from 1972 onwards. Since 1969, however, a number of new industrial developments have induced an extension of the site development going well in advance of the initial project. It has been decided to carry out not only the whole of phase A of the project, which calls for an installed capacity of about 1 200 MW, but also to link Inga with the industrial centres in Shaba by a high-tension transmission line of about 1 800 km. This work is partly in progresss and partly at the stage of contract awards.

DESIGN FOR THE DEVELOPMENT

The general design for developing the Inga site was laid down in 1960, in a report by "ABELINGA", an international group of survey bureaux. It was subsequently confirmed in surveys made by "SICAI" (Société Italo-Congolaise de développement industriel), and is based on a number of technical, topographical, geological and hydrographic data.

The essential feature is that the development can be carried out progressively, in line with the increase in the demand for electricity, as foreshadowed in the economic development of Zaïre.

By using two of the lateral valleys (Nkokolo and Bundi) the execution of the project can be divided into three phases covering 16 separate stages (table 1).

Phase A consists of a dam across the Nkokolo valley, from which there will be two water outlets into the river. It falls into three stages marked by the successive construction of two power stations :

external power station of six groups of 58.5 MW each, and →

(1) By way of comparison, the flow ratio for the river Amazon is about 1: 200 !

Table 1

Working specifications at different stages

Phases		Stages	Upstream conditions	Stations	Initial power (MW)			Water volume m^3/sec	Minimum net fall each stage
					Installed		Total useful power		
					Stage	Total			
NKOKOLO	A	1	River offtake 1st Midway channel	Surface	6×58,5	351	300	780	45,50 m
		2	River offtake	1st underground	4×100	751	675	1 600	55
		3	2nd Midway channel	Extension 1	4×100	1 100	1 000	2 200	55
	B	4	River offtakes	2nd underground	8×100	1 900	1 700	3 600	55
		5	Fwamalo Channel	3rd underground	8×100	2 700	2 400	5 000	55
		6		4th underground	8×100	3 500	3 100	6 400	55
	C	7		Breaking load	17×120	5 540	4 900	6 400	35
BUNDI		8	River dam	1st surface	12×216	8 130	7 280	8 500	115
		11	Water level 190.00	4th surface	12×216	15 900	14 400	14 800	115
		12	Intake from the	1th underground	12×216	18 490	16 780	16 900	115
		16	Bundi valley	5th underground	12×216	28 850	26 280	25 300	115

— an underground power station with two sets of four groups of 100 MW each.

Phase B adds a third water outlet to the river, enabling three further underground power stations to be installed at the point of egress from the Nkokolo valley. These will each be of eight groups of 100 MW each.

Phase C calls for a dam in the Bundi valley and ultimately one across the Zaïre river itself. It consists of setting up a circuit-breaking station, with 17 groups of 120 MW each; and finally the possibility of the successive installation of four new power stations, each containing 12 groups of 216 MW each.

Thus, **with the execution of all three phases, the total installed power rating is of the order of 26 850 MW (2)** and an effective power load of 26 280 MW. This is established as follows:

1 000 MW in phase A;
2 100 MW in phase B;
23 280 MW in phase C.

Corresponding to these capacities are the following figures of theoretical production potential (low-tension supplies through transformer stations):

7 700 m. kWh from phase A;
16 300 m. kWh from phase B;
178 900 m. kWh from phase C.

making a total of 202 900 m. kWh.

(2) An idea of the scale of this project, by comparison with other hydroelectric development, can be had from the fact that the most powerful station presently in existence is at SAYAN SEIUSHENSKAYA in the U.S.S.R., which has an installed capacity of 6 700 MW.

WHAT REQUIREMENTS WILL INGA COVER?

In the past, some of the succession of advocates of the Inga development took the view that the harnessing of this enormous potential could only find its justification if it were to feed very cheap power to very big processing industries which were large-scale consumers of electricity (e.g. aluminium production). Those who thought on these lines always considered the first development phase should be on a large scale, with an installed capacity of about 800 MW. Others argued that industries of this kind—which would necessarily work mainly for the needs of other countries, because of the small capacity of the internal market—would only reinforce the unduly extrovertive character of the Zaïre economy. They accordingly suggested that the first phase should be limited to a scale which would be smaller, but nevertheless financially justifiable, looking to Inga to cover the requirements resulting from the normal growth in the industrial and domestic demand for electricity arising in its own supply area.

The troubled period through which Zaïre passed in 1960-67 was not propitious for attracting large-scale investment and the decision to make a beginning on the basis of local requirements seems to have been sound common sense. Its merit was that it set the project going after it had been in gestation since 1929.

The initial project

In 1966, when President Mobutu decided to put the work in hand, the project was limited to setting up the infrastructure for the execution of the first stage of phase A; the erection of a power station with three generating groups and a total capacity rating of 150 MW; and a network of high-tension

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transmission to serve consumption centres in Bas-Zaïre and Kinshasa.

Up to this time the power requirements of this area had been covered by two hydro-electric stations, Zongo and Sanga, with an installed capacity of 87 MW, but a useful load capacity of only 70 or 72 MW. To these were added a few thermal power stations in public and private ownership and the possibility of falling back, if necessary, on supplies from the power station at Djoué (Brazzaville) in the Congo Peoples' Republic.

The normal power capacity available in the area was thus between 80 and 97 MW, depending on the time of year.

In 1967, total consumption in the potential Inga supply area was around 300 m. kWh, an increase since 1959 of 112 m. kWh, representing a mean annual growth of 7.2%.

Forecasts of future demand, made on the pessimistic assumption **that there would be no new industries set up,** led to the expectation of a mean annual growth in requirements of 10.4% in 1968-72, 8% in 1972-74, 8.9% in 1974-80, 7% in 1980-84 and 6% in 1984-89. On this basis there could not fail to be a power shortage by 1972.

Profitability calculations made at this time established that, in the long term, the development of the Inga site was the only solution economically feasible and financially satisfactory. This would be on the basis of progressive development providing for the availability of: 100 MW in 1972; 150 MW in 1974; 200 MW in 1980; 250 MW in 1984; 300 MW in 1989.

Since then there has been a considerable and very positive development in the economic situation in Zaïre in general, and more especially In the zone potentially to be covered by Inga.

This was the period when order had been restored, the administration given a firmer structure, public finances put in good shape and economic activity restarted, so that the credit of the State was generally reestablished. The atmosphere was now propitious for an influx of external capital and the expansion of the established industrial sector.

The interest of foreign investors took the form of new industries set up not far from Inga. The more important of these included:

— steel mills at Maluku—250 000 tons of rolled products and pressings;

— cement plant in Bas-Zaïre—500 000 tons of cement and clinker;

— tyre factory at Kinshasa—200 000 tyres;

— several automobile assembly units, also at Kinshasa.

Around the same time, a number of producers of consumer goods and equipment, such a breweries, textile mills and cement, increased their production capacity, in some cases on a very large scale, so as to deal with the growing market demand.

In 1967 it had been difficult to foresee all this, and the demand for electricity thus went far beyond the initial forecasts.

This led the Zaïre authorities to review the timetable for the Inga development and to introduce important changes.

Whereas the initial project had only called for effective additional capacity of 300 MW by 1987, the progress of industrialisation led to this supply potential being scheduled for 1974-75.

Extension of the project

For the planners in 1967, the extension of the installed capacity beyond 300 MW was left to a rather vague future. Subsequent events led the Zaïre authorities to speed up the plans and embark on the remaining stages of phase A.

Table 2

Annual energy production at different stages

Phases	Stages	Energy in 10^9 kWh	
		HT outputs Inga	LT transformers reception points
A	1	2.4	2.32
	2	5.4	5.2
	3	8.0	7.7
B	4	13.6	13.1
	5	19.2	18.5
	6	24.8	24.0
C	7	39.2	37.8
	8	58.2	56.1
	9	77.2	74.4
	10	96.2	92.8
	11	115.2	111.1
	12	134.2	129.5
	13	153.2	147.8
	14	172.2	166.2
	15	191.2	184.5
	16	210.2	202.9

Outstanding among these events were the development programmes for copper mining and processing in the Shaba region. GECAMINES, which then had a copper production capacity of around 350 000 tons, decided to raise it in the next few years to around 600 000 tons. At the same time two international groups (SMTK and SODIMIZA) were granted concessions in the same region and were proposing to instal production capacities of some 180 000 tons at an early date.

The Shaba copper production in 1980 can be expected to be twice as much as in 1970-71. The sources of power supplies in this region are not enough to cover the demand set up by this expansion.

The plans had in fact been made to relieve this shortage by building another hydro-electric station in Shaba itself. The Zaïre authorities, however, thought it would be the best solution to cover the new requirements from Inga in its enlarged form, sending the electricity into Shaba by 1 800 km of high-tension transmission line.

In addition, agreements have lately been concluded between Zaïre and the Belgian companies which have hitherto done the final refining of a large part of Zaïre's copper. These give Zaïre the right, after a certain time, to handle the refining of a large part of its copper production, which it is proposed to do in a new plant to be set up in the Inga area.

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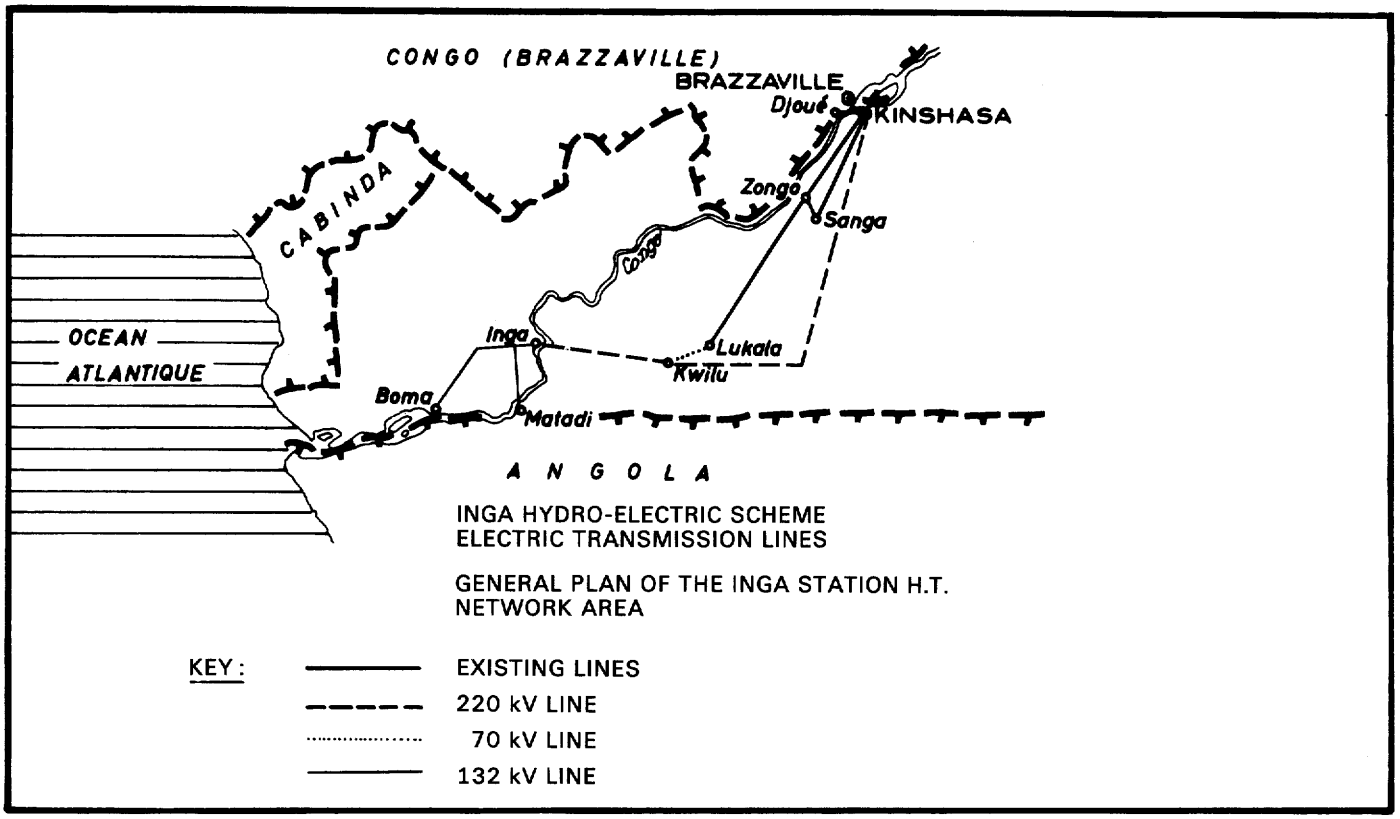


At the same time, contacts have been organised between Zaïre and private firms with a view to the possible establishment in the same area of industries such as aluminium and fertilizers which are big electricity consumers.

In addition, the Zaïre authorities have decided to extend the K.D.L. railway from Ilebo to Kinshasa, to set up a deep-water port at Banana on the Atlantic coast and to connect this with the existing railway from Matadi to Kinshasa. This implies a big change in the strategy of industrial development, for it will make it possible to accommodate industries close to a port which can handle the biggest types of ship, which is not the case at Matadi.

There is much here which may provide justification for the decision taken by the Zaïre National Executive Council to speed up the development of the Inga site far beyond the power capacity originally scheduled. The aim is that electric power should be made available in good time to provide full satisfaction for the demand between now and 1980, when these projects have been carried out.

FINANCING THE DEVELOPMENT

The cost of the initial project covering the whole of the work for phase A was estimated at the time at UA 79.2 m:

— UA 61.2 m for the Nkokolo valley dam, the first offtake from the river, building an external station comprising three groupes each with a power of 58.5 MW.

— UA 18 m to build a high-tension network (including transformers) linking this station to the ports of Boma and Matadi, and to Kinshasa via Kwilu, where a line was planned to connect up with the existing HT grid joining Kinshasa and Lukala with the power stations at Zongo and Sanga.

The finance has been provided by:

— a 12-year suppliers' credit from an Italian consortium for UA 20 m, subject to an initial four-year period of grace, and therefore repayable over an eight-year period. This carries interest at 6 % p.a.;

— a contribution from the Zaïre Extraordinary Budget of around UA 41.2 m;

— a contribution from the European Development Fund, amounting to UA 18 m, earmarked to cover the cost of the high-tension network.

The latter contribution is in the form of:

- a grant of UA 9 m;
- a loan on special terms of UA 9 m. This carries interest at 2 % p.a. and is repayable in 28 years, subject to a 10-year period of grace.

It is worth noting that the finance plan provides for 89 % of the cost of the work to be covered by Zaïre from its own resources.

The expenditure estimates were of course subject to review clauses, and have been raised accordingly. Part of the increase has been accepted in the Zaïre budget and part is being covered by the E.D.F. with an additional grant of UA 1.35 m.

On the financing of the site development beyond the initial 300 MW, the information at present available is only fragmentary. It seems that Zaïre has asked for further large suppliers' credits and proposes to make up the amount by considerable contributions from its own Extraordinary Budget. ■

G. WINTRINGER

ZAÏRE - RWANDA - BURUNDI

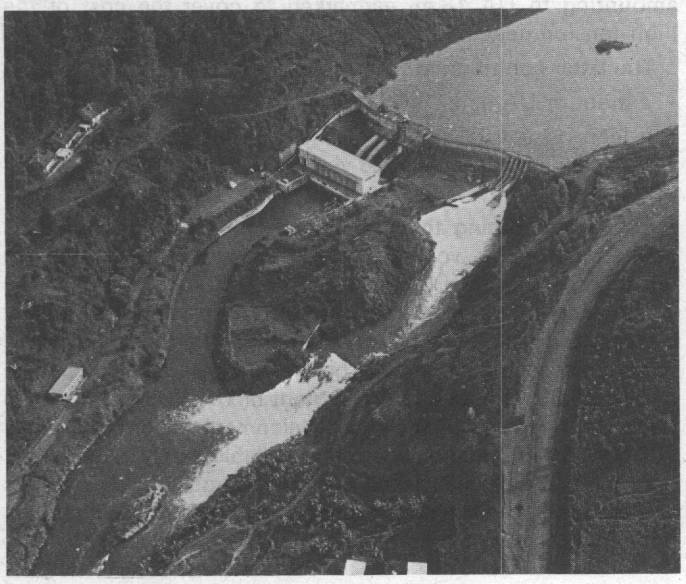
E.D.F. aid for Rwanda in regional cooperation

Plans for cooperation in electrical supplies between Zaïre, Rwanda and Burundi, took a decisive turn when the three heads of State met at Bujumbura last May. Soon afterwards two important new steps were taken.

On August 20, 1974 at Kinshasa, the three countries decided to set up a joint body called the Association for the study of the Electrification of the Great Lakes region (E.C.L.). Its task is to make the preliminary studies and set up a multinational company to electrify the region. Its articles specify that its headquarters shall be at Bujumbura where it shall rank as a non-profit association at local law. Its first director is to be a Rwandan.

At the beginning of October, representatives from the three countries met in Bukavu, under the chairmanship of Mr. Kutendakana Pumbulu, Director for International Cooperation at Kinshasa. They discussed the first steps to be taken for electrical production, and on October 7–9 they received a delegation from the European Development Fund. The discussions confirmed the availability of E.D.F. credits, partly for providing the new organisation with legal, technical and administrative aid, and partly to finance the preliminary survey for a new power station on the Ruzizi river.

The river Ruzizi, with Zaïre on one bank and Rwanda and Burundi on the other, has great hydroelectric potential. The generating station here is at Mururu.



These recent events are a landmark in a new form of cooperation which has an interesting background.

Geographical unity

In this context the region of the Great Lakes means the highland region around Lake Kivu and Lake Tanganyika, consisting of Rwanda, Burundi and the Kivu region of Zaïre. It is in itself a watershed between the basins of the Nile and Zaïre rivers, suited by nature for hydro-electric development. Its rainfall and its territorial conformation result in its offering many suitable sites; and their development is the more important for the fact that the region constitutes an enclave at a great distance alike from the eastern and from the western coast of Africa, so that hydrocarbon fuels are not only expensive, but subject to growing transport difficulties across Tanzania, Kenya and Uganda.

In addition, the region is divided into two, almost exactly at its geographical centre, by a positive treasure house of energy. This is the river Ruzizi, which has Zaïre on its western and Rwanda and Burundi on its eastern bank. It flows down from Lake Kivu to Lake Tanganyika with a difference of level of 685 m, of which 550 m occurs in the first 38 km. Lake Kivu acts as a natural influence to regulate its flow. The four principal sites for development proceeding downstream from Bukavu are at Mururu (21 MW built in 1958), Panzi (36 MW), Kitimbo (36 MW) and Kamaniola (240 MW).

So geography presented a potential power system to serve the entire region. In recent years the concept has gradually become a fact.

Successive stages

Between 1950 and 1955 the basic projects included building a first Ruzizi power station from which three high-tension transmission lines should take supplies to the Bukavu area, the Rwanda mining area and the Bujumbura area in Burundi.

This plan, based on a single power station, was not fully carried out. It was replaced in 1958-59 by substituting two separate supply networks which had previously been scheduled for development at a later stage. The first, on the westward side, included the Bukavu (or Mururu) power station at the point of egress from Lake Kivu, the western bank on the Kivu side as far as the cement works at Katana, and a 120 km transmission line towards Lake Tanganyika connecting it with Bujumbura with a branch connexion to Uvira.

The second network on the eastern side was concerned only with part of Rwanda. It included a power station at Ntaruka in Northern Rwanda, between Lakes Bulera and Luhondo, and a high-tension line Ntaruka-Kigali-Musa-Rwinkwavu with branch connexions into the mining centres.

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This first instalment was brought into operation in 1958-59. It covered requirement forecasts in the medium term but, though there was still a security margin on the western side (Kivu and Burundi), power production and transmission problems arose on the Rwanda side as early as 1965. It was accordingly the Rwanda sector which was the first to draw up a definite programme, which is described below.

At the present stage, it should be noted that this plan called for a connexion between the two sectors, thus recognising the Great Lakes region as a physical unit for electrical purposes.

Since 1966, there has been much discussion between the three countries of possible regional cooperation. From the talks held there emerged the beginnings of an institutional organisation consisting of tripartite commissions with various powers. In 1970 a meeting was held under the auspices of the E.E.C. Commission, and a statement was issued foreshadowing a joint survey company on regional energy problems, to prepare the ground for a multi-national company for the production and transport of power in the Great Lakes region.

Since then there have been many contacts, but regional cooperation made little further progresss before 1974. By this time it was clear that the development projects put forward in Kivu and Burundi must themselves raise a number of problems which would be the more acute owing to the oil crisis. These were the factors underlying the meetings described at the beginning of this article.

Outline of the plan

A broad outline, leaving aside some of the purely local aspects, will suffice to indicate the principles underlying the electric power organisation being created.

The basic element is the connexion between the eastern and western networks by a high-tension line (110 kV-30 MW) of 130 km for which the contract has lately been placed. This links the two networks in a sort of star formation, one of them centered on Kigali, the other on Bukavu.

The expansion in electricity production will come partly from the central development potential, consisting of the Ruzizi, and partly by using resources on the periphery.

It has not yet been decided in what order the various items shall be set up, and there are several possible approaches to the main objective of making investments more profitable and taking advantage of the interconnexion.

At present there are two projects—the power stations at Mugere (Burundi) and Mukungwa (Rwanda)—which are in an advanced state of preparation, and the first works have been put in hand for a second power station on the Ruzizi.

Aid from the Commission and the E.D.F.

For the past 10 years the E.E.C. Commission has been associated in various ways with electrical development policy in the Great Lakes region. Up to the present it has been the principal source of external support.

This was first seen in the surveys and works financed in Rwanda since 1966, and which were manifestly of a regional character. It has also been shown in the interest taken in the negotiations between the three partners on questions of regional cooperation. In this connexion a statement of intention, issued by the Commission on July 15, 1970, explicitly supports regional problems and undertakes to provide assistance to whatever joint organisation may be set up, and promises to give consideration to projects inherently connected with this policy.

Now that the Bukavu meetings have resulted in specific projects, credits have been opened and the funds are available for drawing. Other external aid, bilateral and multilateral, is providing support for connected activities in Burundi and, more especially, in Rwanda, by making available finance for surveys, secondary supply networks, power stations and also technical assistance, all of which can be brought into the general picture.

Importance to Rwanda

During the past 16 years Rwanda has carried out major works for making use of hydro-electric energy in the Great Lakes region. It was the first country to show a keen interest in the more recent regional projects. For the Rwanda government it is important, in the context of the energy crisis, to be prepared for the saturation of the only power station at Ntaruka, which may be unable to provide enough electricity for national consumption in a few years. The principal problems of transmission and distribution in the big consumption centres are to be dealt with by extending the existing lines in the centre of the country and reorganising the management of the system.

The economic importance of these projects is considerable. The new organisation for production and distribution of elec-

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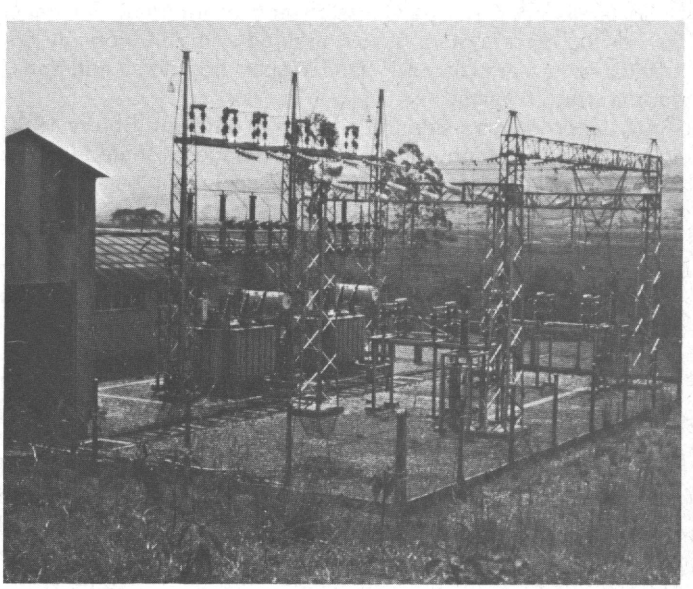
Station at Kagela, near Kigali (Rwanda).



tricity in the Great Lakes will enable Rwanda to provide power for such undertakings as tea factories and pyrethrum processing.

E.D.F. contributions: more than UA 15 million

In Rwanda the E.D.F. contribution, principally for the general infrastructure, has been on a large scale. The aid it has given in the surveys, the investments and in the form of technical assistance, coming from the 2nd and 3rd E.D.F., now exceeds UA 15 million, all of which is in the form of non-repayable grants. Apart from the Inga project in Zaire, this is the biggest E.D.F. intervention ever given for power projects.

The E.D.F. interventions for power projects in Rwanda have been as follows:

	2nd E.D.F. (UA)	3rd E.D.F. (UA)	Total (UA)
Surveys	811 000	210 000	1 021 000
High-tension transmission	1 600 000	7 750 000	9 350 000
Medium-tension transmission	893 000	3 844 000	4 737 000
Technical assistance	23 000	191 000	214 000
	3 327 000	11 995 000	15 322 000

In addition, Rwanda has had considerable bilateral aid from Federal Germany for the power programme. Repayable aid was given mainly for the transmission line from Rulindo to Mulindi, a make-weight thermal power station at Kigali, equipment and/or modernisation in several districts. Non-repayable aid was also given to the operating organisation in the form of material and technical assistance.

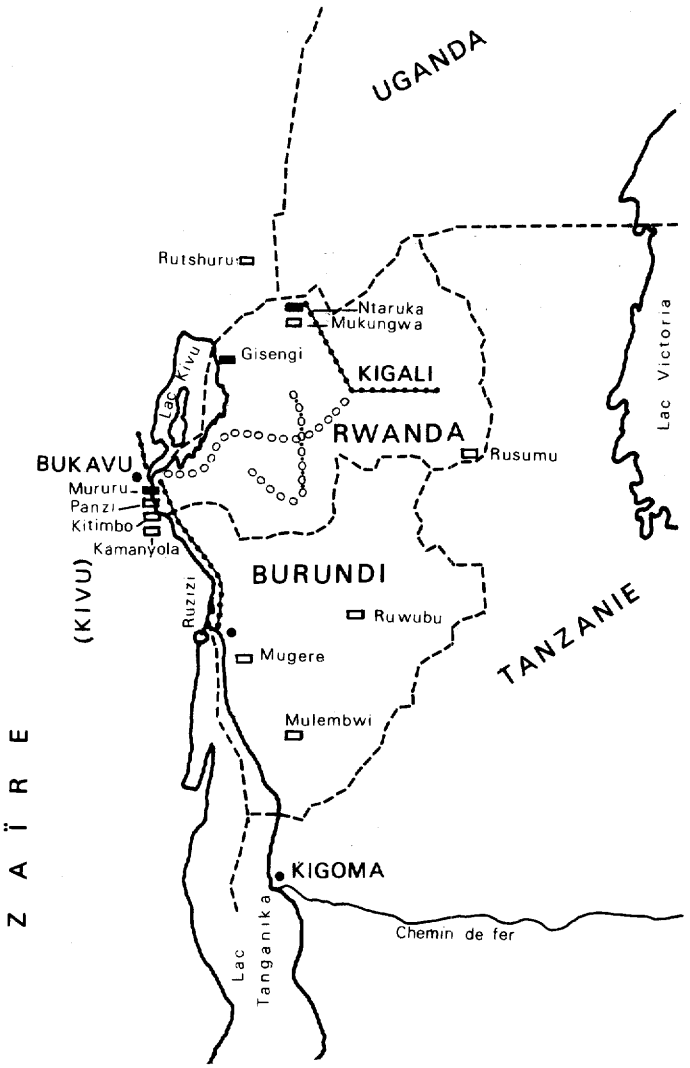
The future

So far as concerns transmission and distribution, the main part of the infrastructure is now assured and will probably not make any further calls on Rwanda (apart from local additions) for the next 20 years.

On the production side the position is different. Before 1980 the power production at Ntaruka and Rwanda's share from the frontier power station at Mururu will no longer be sufficient. Rwanda, or its regional partners, will therefore need to have one or more additional power stations.

A survey financed by the E.D.F. already exists for a power station in Rwanda at Mukungwa, immediately below the existing one at Ntaruka. The other survey currently being prepared is for a second power station on the Ruzizi. The two projects do not compete with one another, and both may be able in due time to find their place in the same general system.

Rwanda has to contend with very great natural difficulties through its enclosed geographical location, but it should find compensation in particularly well-organised electrical supplies relying upon the resources of a wider area. The coordinated aid which has been given to the country is an interesting example of how one of its main disadvantages may be overcome. ■



High tension lines in service

High tension lines under construction

Medium tension lines under construction (scale too small to show existing medium tension lines)

Existing hydroelectric station

Possible hydroelectric site

TWO E.I.B. LOANS TO CAMEROON

In 1967 and 1971 the European Investment Bank entered into two loan contracts with ENELCAM (Energie Electrique du Cameroon). The first was for U.A. 3.5 m. (F-CFA 970 m.) and the second for U.A. 4 m. Both contracts were for financing the execution of three big power development projects in Cameroon. The first was the raising of the M'Bakaou regularisation dam; the second the building of the Bamendjin retention dam; and the third the provision of three further 20.8 MW groups at Edéa III, bringing the installed capacity at the Edéa hydro-electric complex to 263 MW.

These investments will make it possible for the Edéa power station to deal with the increased electric energy requirements, specially those in the towns of Douala (an economic and industrial centre), Yaoundé and Edéa.

MALI

The Sélingué hydro-electric dam project promises agricultural progress

by Siegfried GRUNER

In most African countries the consumption of electricity is comparatively slight, and there is usually a noticeable imbalance between different regions in the same country. Urban development creates a constantly increasing reserve of potential consumers and keeping them supplied is a growing problem.

A specially important aspect of urban development is the growth of the capital cities in the African countries. Other factors making for increased consumption of electricity are the development of centralised public and private services, the growing importance of national and international organisations and, in many cases, the setting up of new industries.

In Mali, all these considerations apply. Consumption of electricity is small in absolute figures, but its growth is considerable, and the total has almost trebled in the past decade:

1962	14 m kWh
1967	27 m kWh
1972	40 m kWh.

Requirements in the Bamako area (1)

More than 80 % of the electrical consumption is in the area around Bamako, the capital city, where the problem of maintaining sufficient supplies is now acute.

A study of the market for electricity in Mali shows a considerable production deficit in future years, more especially in the area round the capital. Bamako is currently supplied from the hydro-electric station at Sotuba, and the thermal station at Bamako-Dar Salam. In 1972 the total production from these two stations reached a peak of 40 m kWh, nearly three-quarters of which came from Sotuba.

The requirements forecast for this region specify consumption of 120 m kWh in 1980, rising to 170 m kWh five years later and 250 m kWh in 1990. These estimates do not allow for the needs of a fertilizer production plant, the construction of which is now under consideration.

The immediate solution envisaged by the Mali government is to cover the growth in requirements by extending the thermal station at Bamako-Dar Salam. It would nevertheless seem preferable at the present stage to seek a further development of water power.

(1) Editor's sub-titles.

Competitive costs of water power

The cost price of thermal electricity is currently not far short of 30 Mali francs per kWh, and the cost of water power is substantially less. For thermal power production the cost of fuel is the main item, and there is the added disadvantage that this is a heavy burden on the Mali trade balance. All the oil products which Mali uses have to be imported and the country has no seabord, so that transport cost is a substantial extra burden.

These considerations have led the Mali government to consider building a retention dam which will not only produce electricity, but will also provide irrigation for agriculture and better conditions for river transport. The site chosen is at Sélingué on the Sankaraui river, a tributary of the Niger some 150 km above Bamako.

The final surveys are in hand

The project is among the top ones in Mali's planning priorities and the preliminary technical and economic studies have already been financed by the E.D.F. and U.N.D.P. The Mali government has now decided to go ahead with the final surveys for the project.

Apart from the surveys dealing with agricultural development and the social-economic aspects (including the effect on agriculture) the surveys now in progress can be summarised as follows:

1. Compilation of specifications regarding the erection of the dam and power station, including transmission lines, and basic particulars for the call for tenders;

2. Additional studies of prospects for marketing the energy produced, with examination of the possibility of setting up new industries which are big power consumers;

3. Financial and economic study of the direct effect of building the dam (apart from the agricultural aspect).

These studies are being financed jointly by the E.D.F. and bilateral aid from Italy, France and Germany. The bigger section of the study, which relates to agricultural development and the evaluation of the overall social-economic impact, is to be financed by the U.N.D.P.

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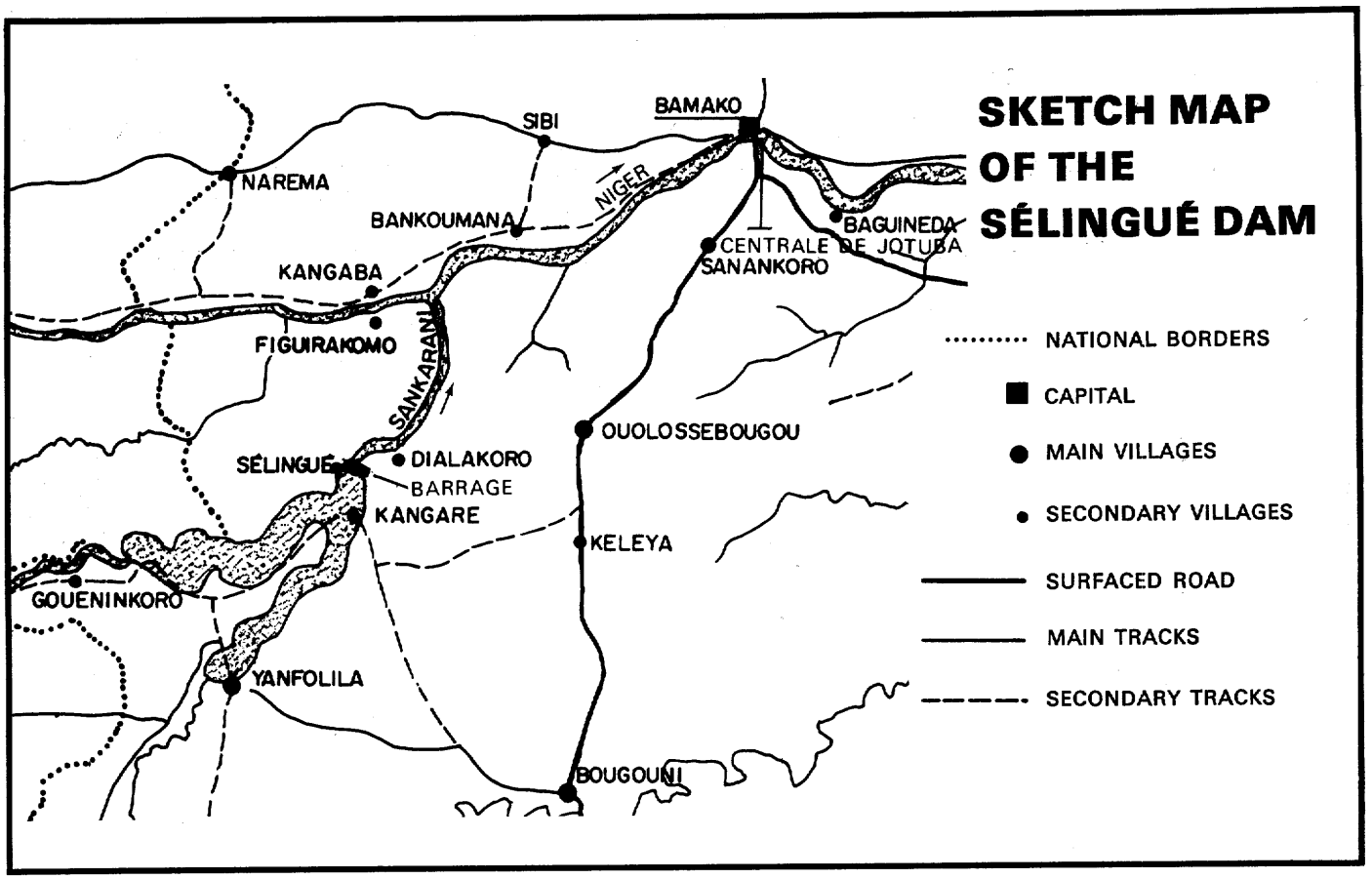


The building of the Sélingué dam will make it possible to produce electricity both at the foot of the dam, by using the falls and putting up a station with an installed capacity of about 45 MW; and also along the river, to increase production in low-water periods of stations which are not backed by considerable water retention, such as Sotuba where the capacity now available could be doubled. There will thus be about 5 MW of additional installed capacity. The extra hydro-electric power which could be produced on a running basis will be of the order of 200 m kWh per annum.

The proximity of the Bamako area, where the power requirements are particularly high, means that all the electricity thus made available will have to be used in this region; but this does not exclude a possible connexion of the hydro-electric stations with other consumption centres in a more distant future.

Joint financing

The first stage of the work covers the construction of the dam, the Sélingué power station and the high-tension line from the dam to Bamako. The current estimate of the cost is 25 800 m Mali francs (UA 46.4 m).

The E.E.C. Commission has already said it is in favour of participation in the finance of these works by the 4th E.D.F., if and when this is constituted. In addition to the three sources of European bilateral aid participating in the final surveys, interest in the project has also been expressed by the World Bank, B.A.D. and the Canadian Government, in the course of discussion meetings called by the Commission at the request of the Mali Government.

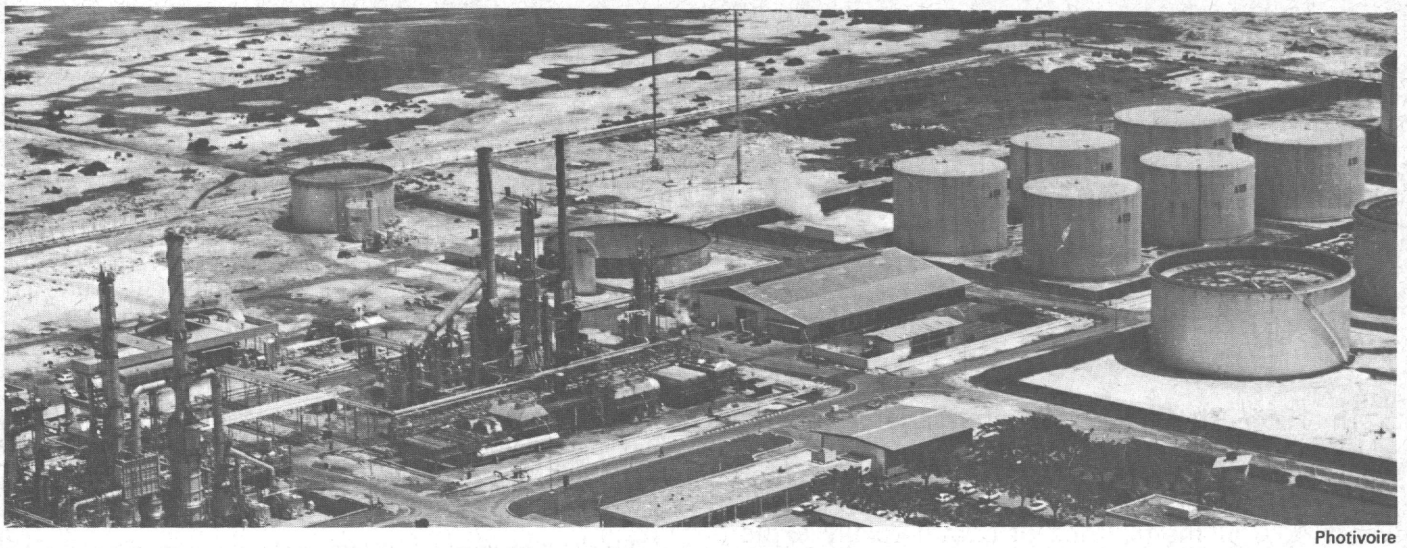
During the first half of 1974, a start was made on the surveys and research still needed before a definite decision on the project can be made.

At the request of the Mali Government, the Commission is assisting it in coordinating the survey work. Moreover, since the credits needed for carrying out the project will exceed the potential aid which the E.E.C. can offer, the Commission is keeping other possible lenders informed.

The final studies described above will probably be completed in the first half of 1975, so that definite decisions by potential lenders should be possible before the end of the year. In view of the very considerable increase in the prices of oil products and the disastrous effects of the recent drought, the building of the Sélingué dam for electrical generation and agricultural purposes seems a matter of great urgency for the Mali Republic.■

S. GRUNER

Oil refining in the Ivory Coast



Photivoire

General view of the S.I.R. refinery and oil tanks.

The Société Ivoirienne de Raffinage (S.I.R.) is just 12 years old. It was formed in October 1962 and has a capital of F-CFA 1 000 m, divided into 100 000 shares of F-CFA 10 000, of which 10 % are held by the Ivory Coast government.

The registered office is at Abidjan.

The refinery and its production

The refinery in its original form consisted of a single distillation unit and a catalytic cracking plant which came on stream on August 30, 1965, with a production capacity of 700 000 tons per annum. Between 1965 and 1971 the capacity was raised to 900 000 tons, as forecast in the original expansion plans dating from 1962.

The second phase of expansion was completed in September 1973 by the entry into service of a new combined distillation/cracking unit which raised the capacity to 2 m tons per annum. This called for an investment of F-CFA 3 197 m, including additional storage units.

The fractions produced consist of butane; normal and super motor fuel; jet fuel and kerosene; gas-oil, diesel oil and fuel oil.

Crude oil throughput (tons)	1969	1970	1971	1972	1973
from: Nigeria	—	—	312 665	514 136	416 195
Persian Gulf	—	—	105 226	507 129	679 552
Gabon	273 061	207 653	211 030	78 765	68 476
Algeria	488 201	516 153	129 169	—	—
Total:	761 262	723 808	758 090	1 100 030	1 164 228

The throughput schedules are for 1.4 m tons of crude in 1974 and 1.5 m tons in 1975.

The output in 1972 consisted of 1 054 061 tons of products rising in 1973 to 1 115 212 tons.

Production	Butane	Motor spirit: Super	Motor spirit: Normal	Kerosene	Gas-oil	Diesel oil	Fuel oil
	T	cu.m.	cu.m.	cu.m.	cu.m.	T	T
1969	10 401	36 322	185 490	100 602	174 017	72 263	259 689
1970	9 973	46 363	188 993	111 472	151 689	71 231	221 378
1971	5 845	55 180	111 472	46 774	187 357	85 314	288 634
1972	7 283	64 628	223 075	106 226	265 515	104 998	424 850
1973	6 996	72 520	210 159	128 167	267 266	115 794	460 466

The area supplied from the refinery consists of the Ivory Coast, Upper Volta and East Mali. Up to the present it has covered these requirements from its own production and from imported supplies, but as from 1974 it has had to cover the whole market itself.

Market in Upper Volta and East Mali

		1969	1970	1971	1972	1973
Butane	T	747	767	741	523	517
Gasoline (super)	cu.m.	167	911	1 246	1 574	2 230
Gasoline (normal)	cu.m.	33 355	54 695	57 897	71 053	75 725
Dual purpose	cu.m.	21 148	26 735	24 562	26 776	40 259
Gas-oil	cu.m.	18 924	24 117	20 813	23 748	29 718
Diesel oil	T	10 658	13 062	15 300	16 128	22 212
Fuel oil	T	1 094	2 276	2 703	3 411	3 521

Exports

		1969	1970	1971	1972	1973
Butane	T	6 041	4 747	484	1 143	491
Fuel oil – bunkers	T	49 264	70 578	118 526	127 731	192 281
Fuel oil 1500	T	152 306	58 830	36 175	151 338	72 919
Value (F-CFA m)		718	485	515	992	738

In 1973, the exports of fuel oil were consigned to Dahomey, the Canary Islands, Great Britain, Ireland and France.

Those of butane went to Mauritania and Niger.

The sales forecasts for 1974 are estimated at 1 240 000 tons of products.

The oil companies have, however, had to import an additional tonnage of finished products to satisfy the requirements of the area served. These imports in 1973 consisted of the following:

Gasoline (Super)	4 500 cu.m.
Gasoline (Normal)	24 989 cu.m.
Dual purpose	33 227 cu.m.
Gas-oil	60 789 cu.m.
Diesel oil	8 526 T.

Total sales amounted in 1972 to F-CFA 8 298 m, of which the exports were F-CFA 991.6 m. In 1973 the sales were F-CFA 9 229 m, of which F-CFA 738 m was for export.

As of December 31, 1973, the total number of personnel employed was 255, including 24 of foreign nationality ■.

NIGER:

The strangest uranium mine in the world

by Barney TRENCH

In 1966, the french Commissariat à l'Energie Atomique (C.E.A.) confirmed the discovery of one of the biggest uranium deposits ever found. Near Arlit, in the Tin Mersoï basin of Niger, at least 40 000 metric tons of commercially exploitable uranium lay near the surface of the Sahara plain at the foot of the Aïr massif, one of the most barren regions in the world.

The specially-created SOMAIR company (Société des mines de l'Aïr) started operating in November, 1970 and produced 430 tons of uranium in 1971, contained in a sodium uranate concentrate. The annual capacity of the plant is now 750 tons, or 350 000 tons of ore, and is due to reach 1 800 tons in July, 1977. Last year (1973) more than one million tons of ore were carved from the desert.

The mine is already the single biggest industry in Niger, putting groundnuts in second place. In the initial euphoria, the Niger government hoped to earn at least 10% of its budgetary resources from the discovery. French purchases of uranium increased by nearly half last year, due almost entirely to some 1 000 tons of uranium delivered by SOMAIR.

But the commercial viability of Niger uranium depends on an international market that has long been stagnant due to overstocking, and now faces the consequences of the political turmoil following the international oil crisis. When the decision was taken in 1967 to start mining at Arlit, uranium fetched $8/lb U_3O_8 and the definition of "commercially exploitable" was uranium that could be mined for less than $10/lb. By 1972, the price was down to $5 per pound or less, while an average high-quality mineral cost $7-8 per pound to produce. The C.E.A. stepped in to support the mine and agreed to buy the uranium at cost price, but the prospects of sudden wealth in the style of an oil strike had vanished. It was even doubtful whether the programme to double production by 1975 could go ahead.

Oil crisis and O.E.C.D. forecasts

That was before the oil crisis hit the world energy market. Despite the continual technical frustrations, on economic and safety grounds, that have hindered nuclear energy programmes in the advanced countries, the crisis has clearly given these programmes new urgency. The leading powers are agreed in principle, if not in practice, on the necessity of finally harnessing the atom.

This situation must be reflected sooner or later in the uranium market. Uranium is one of the essential raw materials of the future. O.E.C.D. forecasts (1973) say world demand for uranium will match maximum world production capacity from existing resources by 1978. Demand will then double between 1980-85. The important factor is the "lead time"—it takes an average of eight years to put a uranium mine into operation from the first discoveries. Therefore, if no new mines are exploited, present capacity will only satisfy half the world market after 1980. The O.E.C.D. conclusion:

"It is essential that urgent steps be taken to increase the rate of exploration for uranium... Current uranium prices (1973) are generally not adequate to induce the necessary exploration, or the increased expansion of production capacity needed. Some means should therefore be found to ensure that the production levels required are achieved so as to avoid shortage and an unstable market in the 1980s."

The most effective encouragement would naturally be a rise in uranium prices, which would carry the Niger economy with it. One problem is that such a rise would also make uranium mining viable in a number of other countries possessing, but not yet exploiting, the ore, thus reducing Niger's relative lead in the field. Uranium is too evenly distributed in the world ever to have the strategic importance of oil. But there is no lack of optimism in Niger, as is witnessed by recent mining deals. The Cominak company was launched on February 1, 1974, to mine some 2 000 tons of uranium a year, from 1979, at Akouta, 10 kilometers south of Arlit. The company represents an association between the Niger government, the french C.E.A. and a japanese consortium of about 20 companies, the Overseas Uranium Resources Development Company. The Akouta seam is even richer than Arlit but further underground, requiring considerable mechanisation.

Niger and the C.E.A. have also formed agreements with the west german company Urangesellschaft (in December 1973) for prospecting and exploitation rights to 100 000 square kilometers of the Djado region in the north-east of the country,

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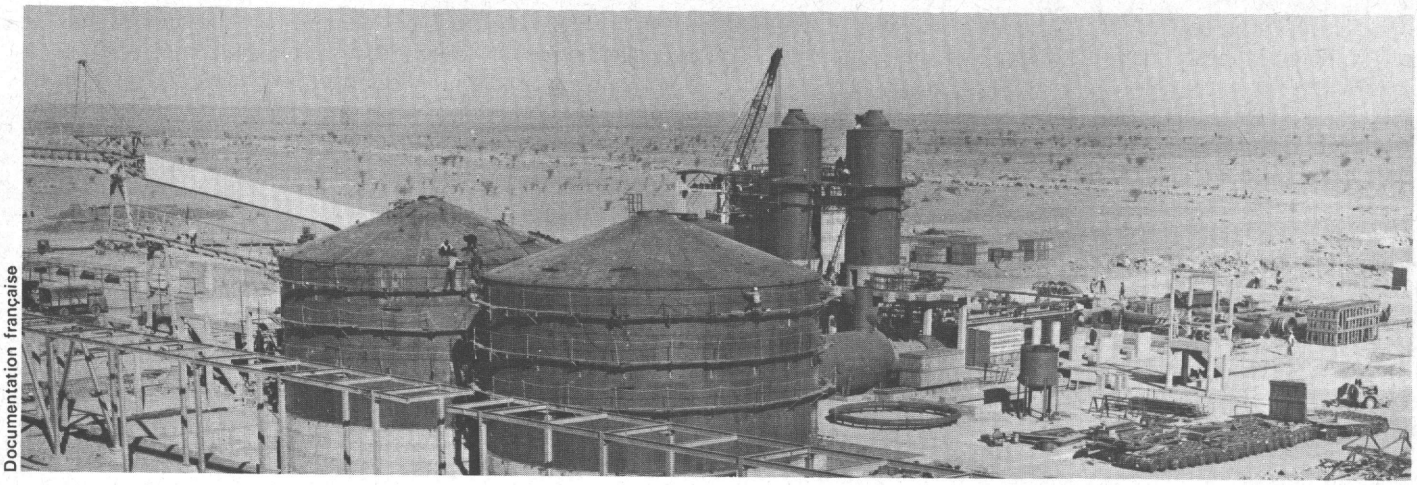

Documentation française

The construction of the uranium ore processing plant in the heart of the desert at Arlit (Niger).

an operation evaluated at around $13.3 million and which may include a new japanese partner; and with the american Continental Oil Company, Conoco, for prospecting in the Imouraren region 80 kilometers south of Arlit.

Meanwhile, Niger has been negotiating with France to revalue its uranium receipts. The negotiations were begun in March this year, interrupted by the April 15 events and due to resume in October. President Seyni Kountché has claimed "fair and equitable revenues" for the country's uranium. Prospecting is continuing and the reasonably assured resources at less than $10 lb U_3O_8 are estimated at 60 000 tons of uranium.

The story of the discovery

Aerial prospection surveys of the Arlit region began in 1954, some 12 years before the discovery near Arlit of the second or third largest deposit in the world. Uranium prospecting had turned away from rock seams to alluvial plains where the mineral might lie in easily-mined beds. This guess proved correct in the Aïr.

A number of early sites were explored and the possibility arose in the late 1950s of a uranium-rush in the Sahara. Aircraft surveyed 2 300 sq. miles around Aïr. A discovery in 1957 led to systematic prospecting at Azelik, where 6 000 tons of good quality (3%) ore were found in 1959. But the seam was 100 metres down and mixed with lime carbonate. After a geological survey, including digging trenches and scintillometric traverses by automobile, three different in-depth surveys began. Electronic geophysical measurements were complicated by surface disturbances due to the aridity of the ground, the salt water-table and sandstone and clay interaction, and the most practical prospecting instrument often proved to be the hammer. Some 14 000 feet of cores were drilled to determine the structural geology.

The importance of Azelik was not the ore found but the opportunity it gave to perfect prospection techniques in the region. The study of exposures, close-spaced grid drilling and trench survey made it possible to define the precise connections between mineralisation, sedimentation modes and paleo-structures. Under the ambitious C.E.A. research programme, wide areas of the basin were surveyed by air to confirm the metallogenic model of the area that was being constructed from field samples. Where the right conditions occurred—and this could not always be determined by analogy with other uranium fields—detailed work could be undertaken. Before then, the Tarat seam in which the big discovery lay was investigated in vain.

Operations were divided into three groups, the Afasto (carboniferous), Irhaga (jurassic and cretaceous) and Tegama (cretaceous) zones. It is the first of these that has so far given the most spectacular results. At Madouela, discoveries in 1962 were followed up for two years to reveal some 8 000 tons of uranium oxide—substantial, but insufficient for profitable mining and 70 metres deep. In 1964 the investigation moved towards Arlit and grid-drilling revealed a heavy mineral seam. Mineralisation was distributed equally through the complete height of the Tarat-Mandouela formation. Finally, three drill holes, each 2 400 feet apart, struck the Arlette deposit, star of the Arlit group.

Since then seams of comparable quality have been found at Akokan by the Niger, France, Japan consortium, and at Imouraren, where the american Conoco company has been negotiating with Niger and France over an $8 million investment.

The mine

The decision was officially taken in Paris to start mining on July 6, 1967. SOMAIR was created the next year, with C.E.A. participation of 33.5%, the Niger government 16.75% and the rest found by private french, german and italian firms such as the Compagnie française de minerais d'uranium.

The problems were enormous. Arlit is in the middle of nowhere, 150 miles from the nearest town and 1 250 miles from the coast, in flat, dry desert. A complete town for some 6 000

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people had to be built, at a cost of $10 million, and enough water pumped from underground to allow the uranium to be fully exploited over some 15 years. A pilot plant was built for 1970, when a thousand Niger workers and a hundred european technicians were due on the site, to be followed by a full-scale plant in 1973.

Top-level technology was brought into one of the remotest corners of the earth, and if the water runs out or the uranium market fails to respond to the energy crisis, Arlit could become a ghost town instead of the first industrial centre in the Sahel.

Arlette's great advantage as a mine, besides the good quality of the ore, is that the uranium lies close enough to the surface to allow open-cast extraction. Nevertheless, up to 10 tons of sterile ground has to be blasted away for every ton of mineral. The mine now resembles a giant basin carved in progressive steps.

The brown-black uranium oxide is treated on the site to produce a 70-80% concentrate. This then has to be taken 1 000 miles by road to Tahoua and finally by rail through Dahomey to be shipped from Cotonou. The imports supplying the site by the same route are a massive 30 000 tons a year.

The technology

Ore passes through some 24 stages at Arlit under a process designed and installed by Pechiney Ugine Kuhlmann, the Parisian nuclear group. It is a strong acid leaching process.

Granules of uranium ore are impregnated with an acid solution to break through to the mineral components, which are then leached out in a uranyl sulphate solution which is dried, precipitated with caustic soda and filtered.

The fact that the Arlit ore contains organic compounds of tetravalent uranium means that conventional digestion of a slurry with dilute sulphuric acid is not economical. The required residual concentration of sulphuric acid is 100 grams per liter i.e. approx. 100 kilograms of sulphuric acid per metric ton of ore, in addition to 60 kilograms of acid per metric ton of ore actually consumed.

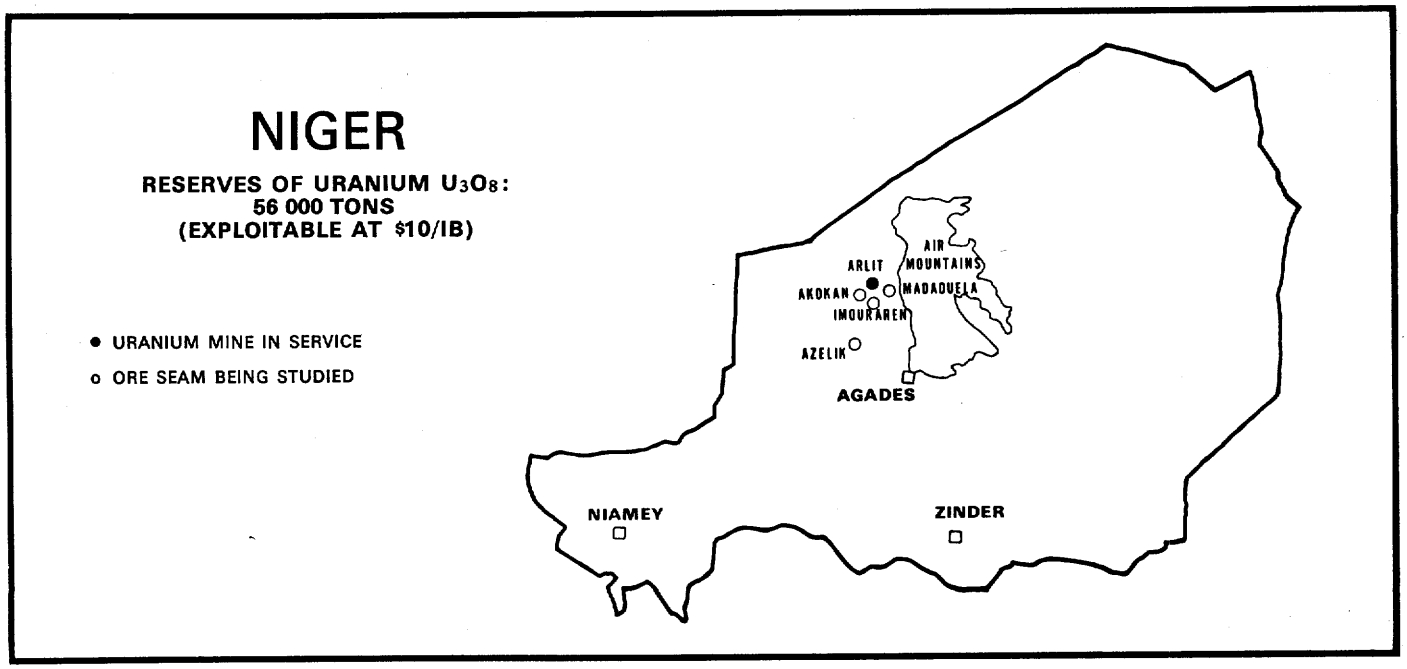
The granule impregnation process proved the only economical method at Arlit, where the technical difficulties are considerably heightened by the desert location. The dry ore is first crushed to obtain a particle size of 0.8 millimeter, the size at which the component grains of sandstone are released, then spray-impregnated using 40-50 liters of water and about 30 liters of acid per ton of ore. This reduces wastage of acid by a factor of 20.

Granulation of the material is effected by spraying water and acid onto the dry ore in a revolving drum coated with an acid-resistant material. On leaving the granulation drum, the impregnated granules are transferred to a second rotating drum, or curing bin, where they remain for three hours. The lagged drum allows the temperature and humidity to impregnate the ore to a solubilisation efficiency of about 97%.

The agglomerated granules discharged from the curing unit are ground in a ball mill fed with uranium solution. The rest of the process is then quite conventional, with washing by means of classifiers and thickeners and the extraction of the uranium by an organic solvent. The virtual absence of diluting water concentrates the washing solutions and saves the vital water pumped from the desert.

The Arlit plant has proved very satisfactory and the specification of the uranium yellowcake is fully up to expectation. ■

B. TRENCH



CAMEROON: Hydro-power at Edéa

The hydro-electric power station at Edéa is built at a dam on the river Sanaga. It consists of three main units:

— EDEA I with three groups of 11 MW each, which came into operation in 1953 and 1957.
— EDEA II, with six groups of 20 MW each, all of which have been in operation since 1957-58.
— EDEA III, with five groups of 20 MW each, only two of which are yet in operation. The other three will be brought into service in 1976-78.

The total installed capacity at present is 200 MW, which will rise to 263 MW with the commissioning of the remaining groups.

In order to supplement the flow of water in the Sanaga, which is very small during the dry season, two retention dams have been built at Mbakaou and Bamendjin on the Sanaga tributaries, the Djerem and the Noun.

The total investment in the project amounts at the present stage to F-CFA 12 500 m. In the final stage it will be in the region F-CFA 18 000-20 000 m.

Production

The production of electric power has shown practically no change for more than 10 years. In 1962-63 it was 1 087 793 000 kW hours, and 1972-73 it was 1 069 850 500 kWh. The 1973-74 production was about 1 100 m. kWh.

Power production costs

The cost price per kWh produced at Edéa has shown a rising tendency. The production costs show an increase each year, while the actual production has been very steady. Between 1967-68 and 1971-72 the annual production costs rose progressively from F-CFA 872.7 m. to F-CFA 1 487 m., whereas the production rose only from 974.3 to 1 067 m. kWh. The production cost per kWh sold has been as follows:

In F-CFA

1967-68	1968-69	1969-70	1970-71	1971-72
0.895	0.898	1.015	1.311	1.393

In or about 1976-78 when the remaining groups in Edéa II have come into production, the estimated production cost will be in the range 1.50 to 1.60 F-CFA per kWh.

Customers: The three principal customers for Edéa power are Alucam, Socatral and the Public Distribution System.

The two former take about 80 % of the power produced, leaving about 20 % for the public system.

The share of Alucam-Socatral, however, is declining slightly and that of the public system increasing. The effect is that the total consumption remains approximately the same. In 1962-63 it was 1 081 m. kWh and in 1972-73 it was 1 061.7 m. kWh.

Area supplied

The power produced at Edéa is consumed:
— at Edéa itself by Alucam-Socatral on sites close to the power station. A very small quantity goes into the town by a medium-tension line at 15 kV to be used for public lighting, domestic distribution and small industry.
— at Douala, supplied by 90 kV high-tension transmission from Edéa.
— at Yaoundé-Mbalmayo, supplied by 90 kV high tension transmission.

Apart from Alucam-Socatral, there are about 38 000 users connected with the Edéa supplies.

Extensions

The Edéa power station started up in 1953, with the commissioning of the first two groups at Edéa I, making a total capacity of 20 MW, and the connecting up of the 60 kV high-tension line Edéa-Douala.

With the formation of the Alucam company, extension works were put in hand (Edea II) culminating in 1957-58 with the commissioning of seven further groups, the last one at Edéa I and the sixth at Edéa II This brought the total installed capacity to 159 MW.

In 1963 the formation of the Electricité du Cameroon Company (E.D.C.) resulted in an increase in the consumption of electricity by the public system to the detriment of Alucam. It had been decided to remedy this by extending the Edéa production facility by building Edéa III, and the retention dams at Mbakaou and Bamendjin to regularise the flow of the river at Edéa.

The Mbakaou dam and the first two groups at Edéa III are already in operation. Bamendjin and the three remaining groups will come into service around 1976-78.

Despite the extentions currently in progress, the power requirements of Alucam for its existing electro-chemical plant are far from being fully covered. When the river is low Alucam is obliged to put 93 of its 220 tanks out of action.

For this reason plans have been under discussion for some years to build a further power station. One projet is for another dam on the Sanaga at Song Loulou with an installed capacity of 240 MW; and the other for a 350 MW facility at Njock-Mpoumé, with a dam on the river Nyong. ■

Compagnie des mines d'uranium de Franceville

The Compagnie des Mines d'Uranium de Franceville (C.O.M.U.F.) operates two uranium mines at Mounana and Oklo in the Haut-Ogooué region in eastern Gabon.

The first disclosures were made at Mounana in December 1956 by the french Commissariat à l'Energie Atomique (C.E.A.).

Prospecting work was put in hand immediately, identifying a mineralised ore-body of high uranium content, amounting to some 6 000 tons of metallic uranium.

This led to the formation of C.O.M.U.F. in February 1958. The shareholders were C.E.A. and a group of mining companies.

The original capital of F 1000 m. has recently been increased by the acquisition of a 25 % shareholding by Gabon.

Work was pushed ahead on the surveys and installation of the mine equipment. The first ton of uranium, in the form of pre-concentrates, was produced from the Mounana plant in March 1961. The Mounana site was operated as a quarry until 1968, as an underground mine until 1972 and then brought back to open-cast working by an extension of the original quarry. It was scheduled to reach exhaustion in the early months of 1975.

Up to the end of September 1974 it had supplied 1 138 000 tons of ore, containing 5 510 tons of uranium metal. Ever since the formation of C.O.M.U.F. it has maintained close links with C.E.A. in carrying out important prospecting campaigns in the pre-cambrian sedimentary basin of Franceville, where its mine is located. This has resulted in further indications of uranium.

In 1968 ore was found at Oklo, about 1.5 km south of the Mounana mine. This time is is not an accumulation, but a mineralised layer between 5 and 8 m. in thickness with a considerable dip, containing about 15 000 tons of recoverable uranium metal.

It was brought into production in 1970 as an open-cast operation, using considerable mechanised equipment. This is still in progress.

Up to the end of September 1974, the mine had produced 234 000 tons of ore, containing 1 131 tons of uranium metal.

The ore extracted is processed in a plant at Mounana itself. This produces an uranate of magnesium containing between 35 and 45 % uranium metal. This represents an annual output of about 1 250 tons of pre-concentrates.

These pre-concentrates are put up into barrels for export.

For the prospecting, extraction and processing operations C.O.M.U.F. employs a thousand workers, including about a hundred supervisory personnel of either gabonese or european origin.

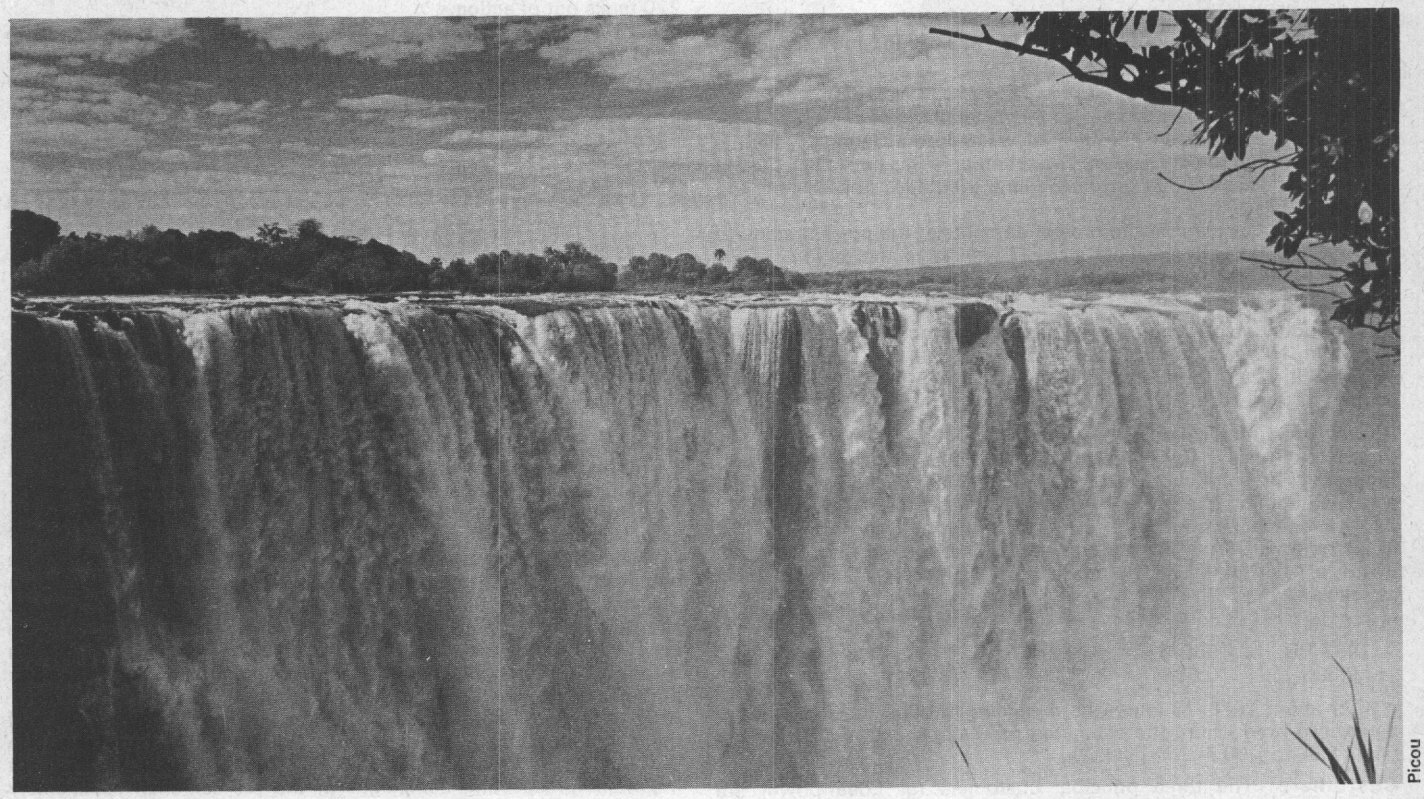
These workers live in several settlements, set up and managed by C.O.M.U.F. and with up-to-date technical and social equipment which includes training, schooling, clubs, medical and social services, water, electricity, roads, post and telecommunications.

The future of C.O.M.U.F. depends on an underground working, for which the infrastructure work has just begun.

The intention is that, as from 1978, the underground mine shall take over from the existing open-cast operation and raise the rate of output. There is to be a corresponding increase in the capacity of the treatment plant.

The reserves which have so far been proved with certainty suffice for continued operation till at least 1995. ■

CABORA BASSA: An enormous undertaking - but what is its future?



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The Victoria Falls on the Zambesi, over 1 km long with a drop of 120 km, give an idea of the power used at the Kariba and Cabora Bassa dams.

During 1975 electricity supplies will begin from the power station at the big dam on the Zambezi at Cabora Bassa (Mozambique). Within three years it will have produced 3 600 000 kWh. On this first estimate of the Cabora Bassa power production, it will be equivalent to all the power stations in the valley of the Rhône in France. The installed capacity is at least double that of Great Aswan in Egypt; and in 1976, when all the work is finished, Cabora Bassa will rank as the biggest dam in Africa and the fifth largest in the world.

Power production from this enormous dam, scheduled to start in mid-1975, will coincide with Mozambique's accession to independence. It is a factor of capital importance for the economic future of the young Republic, and it has a bearing on political developments in the region.

In addition to the power production, Cabora Bassa may have the world's biggest man-made retention lake, which will do much for the irrigation of some 100 000 hectares of forest and farmland. The agricultural aspect of Cabora Bassa will be the more important for the fact that, even after five centuries of portuguese occupation, the Mozambique economy is still in an embryonic stage. Between 90 and 95 % of the active population are engaged in agriculture, but they cultivate less than 7 % of the total area. Only 2.6 % of the population is engaged in industry, accounting for little more than 10 % of the gross internal product.

Power from Cabora Bassa will enable new industries to be established and will support the operations of many mining undertakings producing coal, iron, copper and manganese.

In this rosy picture of Mozambique's economic future, there is, however, a shadow. Under an agreement made earlier than April 25, 1974, it is provided that 65 % of the electric power produced at Cabora Bassa shall be supplied to South Africa without any counterpart. Such conditions might be a grave prejudice to Mozambique's present opportunities and future prospects of economic development. It is currently foreshadowed in Lourenço Marques that "the projects for the distribution of electric power from Cabora Bassa may be reviewed". ■

Lucien PAGNI

Development, technology and energy

by Detalmo PIRZIO-BIROLI (*)

The concept of an "unfavourable medium" for development is meaningful only in relation to what we, as westerners originating from the temperate zone, regard as the "economic medium".

In our own case, the concept is the more subjective for the fact that the economic rise of Europe between the end of the 18th and the middle of the 19th century resulted from a unique combination of natural and human circumstances. It has been described as "a cumulative process with inter-structural diffusion effects".

This subjectiveness has given rise to a kind of dogma, that the backwardness of most tropical areas could justly be ascribed to the "medium". In the case of Africa, the causal factors most often mentioned were its continental size, its soil and geological characteristics, its tropical situation with the climatic excesses in particular zones, the great distances and difficulty of communications by land or water. There can of course be no denying that there are some media less favourable for development than others, and requiring much bigger investments to get the same results; but this is the case everywhere, even in our own temperate latitudes.

Resistance to novelty

Nowadays it is becoming increasingly clear that the economic backwardness in most of the tropical zones is not wholly due to the medium or environment, but largely to the fact that our technical civilisation originated and grew exclusively in temperate latitudes. It may be asked whether this means that scientific and technical development is in some way "professionally deformed". It does not seem that this is the case, for science and technology are by definition universal and ready in practice to face every problem.

The answer must be sought elsewhere. Recent critical surveys of the history of scientific thought suggest that it reproduces all the processes and mechanisms of social and general change. This amounts to saying that there is the same relationship between immobilism and evolution, between conservation and innovation, between normal or current science and scientific revolution or discovery.

The distinction is due to T. S. Kuhn, whose work "The Structure of Scientific Revolutions" (University of Chicago Press, 1962) clearly brings out the motivations underlying the resistance to novelty in the scientific and technical world. He notes that normal, or current, science presupposes the existence of a "paradigm" or pattern, in which is contained the whole of scientific knowledge at a given moment in history, and which determines all scientific activity during the period. "Scientists do not normally aim at inventing new theories", he writes, "but are, on the other hand, often intolerant of any such which may be put forward by others". Research is directed simply "to the articulation of phenomena and theories contained in the paradigm". When it comes to scientific revolutions "the appearance of new theories is usually preceded by a phase of profound uncertainty", or they may occur only after setbacks in the attempts to resolve problems arising in current science. "The new theory comes forward as a direct response to the crisis", and the solution of each problem had been at least partly foreshadowed before the crisis had really come upon the scene; but "in the absence of any crisis, these foreshadowings had been neglected".

The occurrence of these processes can be verified not only in scientific development, but in that of society as a whole, and of course, also among the little sisters of science, technology and techniques in general. Here, too, in the course of normal activity, the fundamental pattern is not called in question and the objective is, so far as possible, to extend its application. There are two aspects of this situation. The first is psycho-social, in the form of the intolerance of normal technicians for new solutions which imperil their own working patterns, setting up a psychological threat and an inconvenient sense of personal insecurity. The second is concerned with the process of receptivity, or selection, of the "message". This is due to what psychiatrists call a "selective inattention". When the solution of any problem lies outside the established paradigm or pattern, and thus throws it into crisis, it is apt to be "unseen and unnoticed "because of a selective action exercised in the preconscious. In other words, the paradigm—which is really just a collection of professional habits, intellectual approaches and adaptations to routine—acts as a filter, and lets nothing go through which does not conform to its own internal logic.

Innovation matters more than adaptation

This brings us closer to the heart of the matter. The reserves increasingly expressed nowadays, especially in Africa, with regard to western technology contain in themselves a mistaken approach. The usual request is to bring in technologies which are "better adapted to Africa". Apart from the fact that many of our technologies have already been adapted, however, modestly, any such request to bring things down to the level of *amateur tinkering about* would hurt our scientific and technical pride. *It must not be a question of adapting, but of doing something new.*

It hardly seems honest in the technological field to bring into the development of the Third World the approach to economic models which has unhappily characterised the Western (and

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(*) Head of the "West Africa — Somalia" division of the E.E.C. Commission.

Oriental) patterns. It amounts to saying, "Gentlemen, there are your shoes"—"but... they are much too small"—"then cut off a bit of your foot"—"It hurts!"—"That, dear sirs, is the price you must pay for development."

To do something new means to invent. Our science and our technology are well up to the task of invention when they are pushed into it by the necessities of our own development, even when it comes to reducing the size of the brain and the instruments contained in a satellite. We can bring this down to earth again by quoting the case of northern Siberia, which the U.S.S.R. is at present trying to make habitable so that its enormous resources can be brought into economic use. Through most of the year the temperature at Norilske varies between −30° and −50° centigrade. If such problems can be solved, it is hard to see any reason why other problems, such as those of the Sahel in Africa, could not also be brought to solution. In the Sahel the bait of economic resources is of course on a much smaller scale; but the objective still remains of improving the profitability of the big investments international aid has long been bringing into these particularly difficult regions.

We need, therefore, to set to work—as indeed the E.D.F. has been doing for some time on a number of technological problems—on doing something new. The costs of theoretical and applied research are of course considerable, but they are only a tiny fraction of the total amount involved in investments. Moreover, the scientific research institutes in the E.E.C. countries ask nothing better than to make real use of their capacities.

Having raised the general problem of fundamentally new technologies, there is no space here to go into details. There is an infinite number of branches of technology which need development by new original means. Some of the research has been going on for years, such as the development of short-cycle millet, fixed-date sowing, salt-water cultivation; and there is a whole range of sectors in which research has not, up to the present, made any serious progress, or in which experimental solutions have yet to be brought within the range of practice. This includes such questions as sowing pasture from aircraft; slow irrigation at smaller cost; artificial rainfall; optimum use of traditional food crops; the use of traditional crops for new purposes; standard procedures for dealing with natural or artificial pools; a fool-proof type of hand pump for wells; suitable mechanical tools for anti-erosion work; rational and inexpensive systems of reafforestation; and so on and so on.

Energy from wind and sun

The two sectors which override all others in importance, because of the multiplicity of potential uses, are those of using energy from the wind and from the sun.

In the Third World the problem of these sources of energy has always been important but, the rise in oil prices has now made them vital. Because of this, we cannot afford to wait till western technology has found out how to harness these types of energy on a big scale. For this there are many potential solutions, but their practical application is still some way ahead. They would include solar cells, such as are now used only in satellites for the direct conversion of the sun's energy into electricity; thermal (turbine-cum-alternator) solar power stations; thermal mechanisms to use the differences of temperature in the oceans; the direct use of irradiation for space-heating and air-conditioning; big turbines turned by the wind to generate electricity, mounted on platforms in offshore waters.

What is really needed is rapid research on producing these forms of energy *on a small scale*, with a view to reaching a scale of action *in line with actual requirements in arid zones*. First of all comes the question of pumping water from wells, borings, rivers, lakes or artificial ponds for irrigation, whether normal, slow or supplementary; and also for drinking water, the watering of cattle and supplies to small industries and artisan workshops. Irrigation is the most important of these uses; and the scale of apparatus needed is quite modest. The differences of level need be no more than 15 or 20 m, the flow will vary between 1 and 15 litres per second; the motive power between half a horsepower and 30 h.p.; the electric potential between a quarter of a kW and 20 kW.

It is of extreme importance to have sources of energy, even on so modest a scale, for this would give viability which is at present lacking to many agricultural projects which are a material burden to the budgets of associated countries. Because of the oil crisis, the cost of fuel for pumps has risen so far that it is now prohibitive.

There are already prototype wind-powered stations which can produce 150 000 kWh per annum, so that it seems that in this sector we are not far short of the target. They can work with only a slight breeze (5.4 kmph), so that they are suitable for the Sahel, where there is very seldom anything like a dead calm. In solar energy we are not yet so far advanced, though the sun-powered Masson-Girardier pump at Chinguetti, in Mauritania, has achieved a flow of 2.6 litres per second, and is thus capable of supplying water to a population of about 2 000. The research centre at Ispra is also working on research of this type, and it is to be hoped that satisfactory progress will be made.

All the same, it is disappointing to note that the governments of the West, though they provide large sums of aid for the development of countries in the Third World, do not seem to be interested in developing new technologies for the purpose.

Because of the general lack of interest in low-temperature thermic apparatus among industrial companies and official organisations, it took seven years (1962-69) for Dean Masson of the University of Dakar and research worker Jean-Pierre Girardier to succeed in producing three operational pumps for Niger, Senegal and Upper Volta. Had they been working on a destructive weapon rather than a mere pump, they would probably have been enabled to do the job in seven months.

So there are two obstacles in the way of any new technology designed to give maximum effect to international aid to the Third World. First there is the Kuhn phenomenon, consisting of the resistance to novelty of the world of scientists and technicians. Secondly there is the lack of drive and political will on the part of governments, in promoting scientific and technological research for peaceful purposes. ■

D. PIRZIO-BIROLI

Making better use of wood for energy

There are all sorts of ways by which a country's development can be measured. In economists' terms there are the gross national product and the gross internal product, the per capita income and the per capita consumption of electricity. Then there are new standards like the "BB" (Bonheur brut, or gross welfare) and the degree of pollution which, of course, varies with the level of industrialisation.

Among the A.C.P. the usual measuring rod is still the G.N.P., or the per capita income. Progress is not yet measured by the quantity of power consumed—perhaps because, as Charles Aznavour has sung, "poverty matters less in the sunshine". And it is for the developed countries that the energy products of the underdeveloped are required.

Yet energy requirements in the countries of the Third World may well be as real and as important as they are anywhere else, even if they are not in so great variety because the industrial products these countries consume are far less diversified. Perhaps we may ask, what are the uses to which energy is put in the everyday life of non-industrial countries. The answer is very simple. Energy is used first and foremost for cooking, and after this for lighting and for warmth.

This energy comes primarily from wood, which is the source of 80 or 90% of the energy in most of the non-industrial countries. The usefulness of wood, and its social importance in the life of a non-mechanised civilisation, has its embodiment in a number of social rules. Before systems of money became general, and even today in some of the African villages, "faggot fagging" was part of the life of the schools; and the same sort of thing existed before the big changes of the sixties in the family council and local councils in Cameroon and even between the inhabitants and their chiefs. Wood fetching was one of the more severe punishments which "society" could inflict on those guilty of various peccadilloes, such as unjustified absence from the meetings at which the council allocated the important work of common interest, for the Bamiléké social system is socialistic and democratic. The severity of the sentence was in terms of the quality and number of faggots and the height of each. Another example is that, among the Bamiléké, those who provided wood as fuel for needy villagers were considered to have shown their strength and courage, and to be worthy of respect.

In the towns, even though there is more and more electricity, wood is still much used as fuel, especially in the form of charcoal. Apart from the refrigerator, the domestic electrical apparatus so indispensable to the Western woman has not penetrated into African homes. Along the great streets of Dakar, of Douala and other African towns, the women prepare the tea, the coffee or heat up their maize or manioc fritters on a charcoal fire. Dakar alone burns 750 000 cwt. a year.

It is charcoal, too, which heats the housewife's smoothing iron. It has many another use, especially in the forge and the smithy, and does not the smith, in his rugged strength, stand at the very foundations of Africa's civilisation?

All these are some, but only some, of the uses of wood as a source of energy. Now we are in the midst of a crisis, and people can talk only of oil, the foremost generator of energy in the economic and social pattern of today, and for which the Third World has a great need. For the most part, the countries of the Third World are not producers of this precious material; but they are nonetheless affected by the crisis, for the peasants of Africa must now economise every drop of their kerosene.

Both Europe and the United States are going back to their coal mines, and the closure of the pits is not for tomorrow. Conditions nowadays are such that Africa should certainly look to its forest policy. The systematic felling of trees—in most of the countries without any reafforestation—might in the long run be a disaster, and not only from the standpoint of the energy destroyed.

Just as important is the environment and the ecological background, for it needs no Nobel Prize in Economic Science to tell us air and water are in line to become economic materials because they are no longer available in unlimited quantities. They are becoming more and more scarce because they are polluted, and we must have a care lest the same thing happen to our timber. Its importance as a source of energy may well be greater than it seems today. It is no exaggeration to say that this enlargement of the part it plays should now be brought under active consideration. And, at all costs, we must preserve it from the waste of unconsidered exploitation for commercial ends. ■

Lucien PAGNI

An example of E.D.F. activity in Madagascar

Operation rice production

by Robert GRÉGOIRE

In 1965 the Malagasy government found itself for the first time obliged to import considerable quantities of rice to meet the growing local requirements. The population was increasing by between 2 and 3 % each year, and the rice consumption per head had risen in a decade from 210 to 230 kg per annum. Despite intensive efforts to increase production, the rise in consumption had run ahead.

The government could not accept this situation for three reasons:

— economic: the planning target was for an improving balance of payments through increased sales of luxury rice for export, and the decrease or disappearance of imports of ordinary rice;

— psychological: the population would not stand for a shortage of "national" rice, which was its staple diet;

— technical: there were big areas of suitable land with a high potential yield per hectare.

On February 2, 1966, the government accordingly issued an order, setting up a "supplementary programme for the expansion of rice growing". This is commonly called "operation rice production", or O.R.P.

The O.R.P. target was particularly ambitious. It specified an increase of 400 000 tons of paddy production within 5 years.

This called for major hydro-agricultural schemes on the eastern and western coasts of Madagascar, which could not possibly be carried out in time; and it needed financial resources out of proportion to what was available, or could be expected from French bilateral aid, European Community aid or from other external sources.

A priority programme was therefore identified to yield an increase of 250 000 tons, and within this was a first section to yield 80 000 tons.

The European Community was asked to take part in financing this programme; its intervention, however, was confined to the malagasy uplands around Antsirabé, Ambositra and Fianarantsoa, the coastal regions of Farafahgaha-Vohipeno in south-eastern Madagascar and Maintirano, Mampikony and Ambilobé in the west. In practice, for the past three years only the uplands and Ambilobé have still been receiving aid from the E.D.F. Between July 1966 and July 1975 the funds allocated for this purpose reached the big total of about 10 000 m malagasy francs. The sources of finance are shown in the following table, the E.D.F. section of which comprised three separate conventions between Madagascar and the European Community.

Source	Total	1st period 1966-70	2nd period 1971-72	3rd period 1973-75
		(million malagasy francs)		
E.D.F.	4 972	2 375	887	1 710
National budget	2 842	624	412	1 806
Peasant subscriptions	2 279	427	200	1 652
Total	10 091	3 426	1 499	5 168

NATURE OF THE OPERATION

With these objectives, these resources and this deadline, and with the geographical spread involved, the operation began with a mass education programme launched by a group of european companies for account of the C.E.A.M.P.—a malagasy State company, Centrale d'Equipement Agricole et de Modernisation du Paysannat, an offshoot of the Ministry for Rural Development which bore the responsibility for the project.

The mass education programme was aimed to modify farming practice by the successive introduction by the greatest possible number of growers of a succession of technical and economic innovations. This implied:

1) avoiding introduction of themes which were really new, limiting the action to improving practice already within the grower's knowledge;

2) being sufficiently certain that the themes propagated would produce positive results for peasants applying them;

3) absence of preliminary requirements conditioning the use of the intensification techniques, such as the need for hydro-agricultural schemes for water control;

4) intensive application of the basic education scheme in the areas affected, so that every peasant should make his own experiment on his own land, eliminating the concept of pilot plantations or localised experiments;

5) directing the campaign to peasants already familiar with the techniques it was sought to improve;

6) and **most important of all**, the securing of quick results which would

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justify the high cost of such an operation. It was thus important that the solutions introduced should be a real answer to some of the **priority needs** of the peasantry.

These basic desiderata determined the structure of the campaign, the methods used and the instruments applied. As we shall see below, they were duly fulfilled in the malagasy uplands, but not in most of the coastal areas.

Structure of the operation

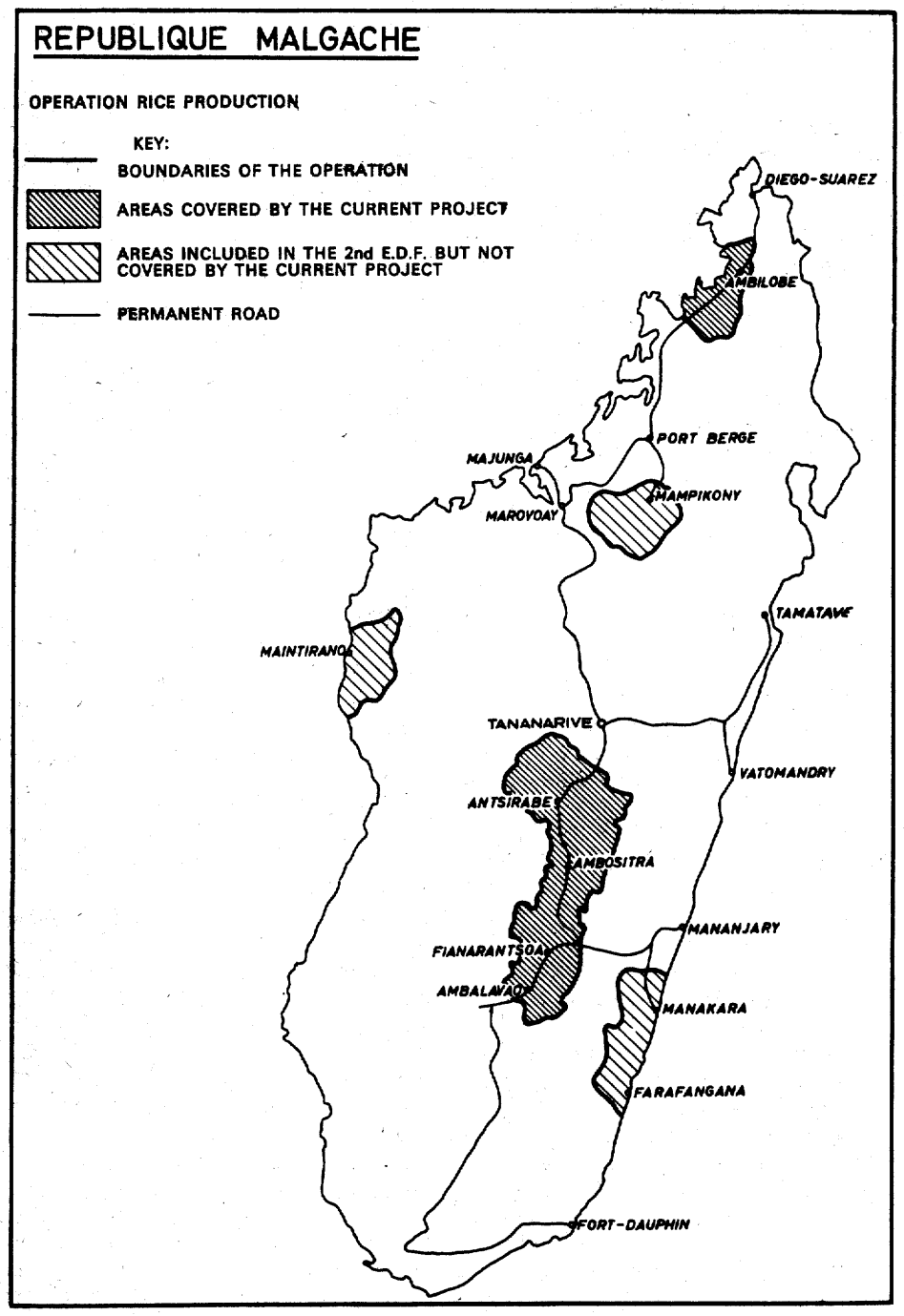
A central planning and control unit was set up at Tananarive to provide the necessary technical support to the field units. These were:

— in each prefecture: a rural expansion unit (U.R.E.R.);
— in each sub-prefecture: the rural expansion zone (Z.E.R.);
— in each rural commune: the rural expansion sector (S.E.R.);
— in villages or groups (200-400 growers): the rural expansion cell (C.E.R.).

At the sector level there was a two-fold organisation, one side dealing with training and popularisation and the other with administration and credit. At the cell level there was only a popularisation officer.

At the top of the pyramid, the Minister for Agriculture and Rural Expansion was kept informed by a programme committee, which was kept continuously in touch with the campaign by the chief engineer assigned for the purpose. It was the committee's job to analyse the results obtained and propose to the minister such intervention as might be required.

In the prefecture, which is the geographical unit for State planning, there was a liaison committee, with the prefect as chairman. Its task was to coordinate the operation with other action and activity in the rural area.



The method used

There were three main tasks running in parallel:
— setting up a down-to-earth popularisation system suitable for the job;
— improving the technical knowledge of the peasantry;
— setting up a distribution system for the necessary instruments of production and a credit service to enable peasants to acquire them.

This necessitated continuous training for the supervisory and administrative personnel, each level training the one immediately below it and the training being based partly on the themes for propagation and partly on information and experience from the field indicative of the reactions being obtained.

For the peasant himself, what was needed was verbal explanation followed by demonstration in the field or in the village, covering the techniques being propagated and the use he can make of the administration, the credit facilities and the primary marketing organisation.

The instruments of action

1) The staff used

A staff of about 1 000 was used for the campaign at all levels, from the planning

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centre to the basic popularisation itself. At the outset the technical assistance required was considerable, comprising 30 officers, but this has now been reduced to eight officers and will be further reduced to five by the end of the operation. The assistance officers are being progressively replaced by suitably trained malagasy personnel. The general management of the operation has, since 1972, been in the hands of a malagasy staff unit.

2) Principal themes for propagation

The essential task is to popularise improved methods of rice-growing. In the first instance these comprise:
— a seed bed well dug and well manured, and a low density of sowing;
— planting out at an early stage, planting in line and using vigorous young plants from the seed beds.

In a second phase, the essential elements include the use of fertilizers, rotary hoeing and improved water control.

After this point the operation leaves the purely productive side. It goes further back and tackles such questions as getting the right tools; storage, delivery and distribution; cash and credit sales; material maintenance and primary artisan processing. On the post-production side, the questions dealt with include improved primary marketing.

3) The factors of production

Between 1966 and 1974 necessary instruments of production and its intensification were provided and used. These included:
44 000 tons of chemical fertilizers;
900 tons of insecticides;
21 000 rotary hoes.

These were made available with substantial subsidies amounting to as much as 30 % of the cost price.

4) Credit, storage facilities and marketing

The distribution of these products and materials was the occasion for working out a simple and flexible system of short-term credit, and for setting up storage facilities as close as possible to the points of consumption.

In the course of eight seasons loans were made in 155 000 cases, amounting in all to 450 m malagasy francs. The repayment rate was always above 95 %.

For storage purposes, over 350 sheds were constructed with space for about 10 000 tons of crops and fertilizers. Another provision was for improving the access paths and roads to facilitate the transport of crops and material.

5) Rural artisan work

The operation helped towards the setting up of establishments by artisan workmen to handle repairs of the material used, and in some cases to make it.

6) Small-scale hydraulic work

For the purpose of ensuring water supplies to the rice fields, a special service was set to work to improve the existing small water installations serving the agriculture areas, and undertaking the provision of new ones. The peasants took an active part in this campaign, working on the projects and providing material.

7) Accompanying studies

A number of additional studies were made by the Madagascar Agronomic Research Institute, or under its auspices. These were mainly intended to adapt the main themes of the popularisation campaign to special local conditions, which affect aspects such as dates of sowing, density of planting out, the use of manure, seed treatment and the varieties used. Another task was to work out the basic popularisation themes for rain-dependent rice cultivation.

8) Improved paddy marketing

Peasants were encouraged to form selling groups, which were set up ad hoc and were of limited duration. This enabled producers to reduce the number of middlemen, and thus add between 10 and 25 % to the price effectively received.

THE RESULTS

The results of the campaign were far from uniform:
— On the east coast and on the west coast, except for Amlilobé, progress towards the targets did not justify the expenditure, and the operation was classified as a failure and discontinued after the third year:
• on the east coast this was because cultivation methods before the mass education campaign were less advanced than was required for the technical points propagated in regard to manuring, methods of planting out, density and the use of animal traction;
• on the west coast the failure was due to the lack of a preliminary condition: the main work on the hydro-agricultural schemes was insufficiently advanced, except in the case of Amlilobé.
— In the Uplands, where the main part of the action took place, there were some partial failures, but a number of good results.
• In 1973, the improved method of rice cultivation was followed in its entirety by 100 000 peasants. Rice fields covering 55 000 ha used plants taken from improved seed beds; replanting in line was carried out over 24 000 ha; and fertilizers were used over 21 000 ha, though in quantities below the recommended concentration of 300 kg per ha; and 20 000 ha of rice fields got secure water supplies as a result of 900 small hydraulic operations.
• The popularisation machinery operates locally. It has a position close to the life of the peasant and it is manned entirely by Madagascar nationals.
• A well-adapted credit system is operating satisfactorily, and there is an adequate number of administrative depôt shops, where the peasant can obtain supplies and material for production. In the villages there are artisan establishments in which the maintenance of material is well understood.
• The peasants are rice growers by nature and habit; and they have learnt new practices and new habits which are factors in increasing production.

Most of the rice produced in the malagasy Uplands is consumed locally, or traded between one village and another. This means that there are no statistics of total production. Everybody agrees, however, that there has been an improvement in standards of living and purchasing power among the people affected by the O.R.P. Taxes and school expenses are now paid with much less difficulty, and the diet has improved, at least in quantity. The amount of rice brought to market per head has been well maintained, despite cyclones in two successive years; and these results have been secured despite an annual growth of nearly 3 % in the population and therefore in the number of mouths to be fed.

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The quantitative targets have been attained, though one or two seasons behind schedule, depending on the sector. On the other hand, sample enquiries designed to compare the yield from traditional cultivation and from improved cultivation, do not disclose very marked improvements. Part of the statistical cause is due to the fact that traditional rice fields, which had been estimated by the competent authorities to have produced around 2.5 tons per ha in 1965, were found in practice to have produced 3.2 tons in 1972. This was probably due to the indirect effects of the action which has been taken. Moreover, the peasant who does not grow his rice by the new methods is now apt to be the odd man out in the village. In the early years of the campaign the position was exactly the reverse. The change has gone further; because many peasants aspire to raise their living standards still further, and are asking for the operation to make similar improvements in their other lines of production, animal and vegetable, comparable with what has happened for paddy.

• Among the setbacks the most important, economically and financially, lies in the failure to develop group marketing on a large scale, so as to bring the considerable growth in revenue effectively into the hands of the producer.

These groups of producers, too, were planned to serve another purpose. They were intended to be a first step towards a reconstruction of peasant life, enabling the individual to play a more important part in the supply system and the credit system, which would help to diminish the number of hands employed and thus to decrease costs.

• Another weak point has been a loss of effectiveness and dynamism in the operation itself.

Between 1966 and 1970, the operation was spreading into new areas and its quantitative results were going ahead. Since 1971, its progress has been tailing off. The number of growers affected by the operation rose from 20 000 in 1967 to 105 000 in 1970, out of the 150 000 rural cultivators within its range. Subsequently the numbers affected have shown no material change.

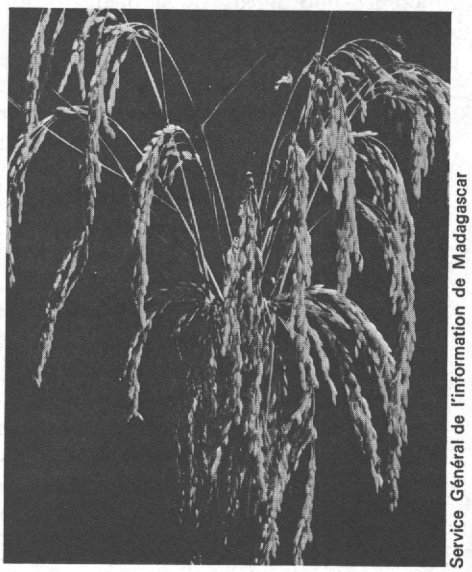
The same applies to the improved rice fields, which rose from 55 000 ha to 110 000 ha, but then remained around the same figure. The annual consumption of chemical fertilizers rose in four years from 300 tons to 8 000 tons, and has since been static around 8 500 tons.

The underlying reasons are many and complicated, but there are a few which seem to have been determinant:

— inadequate intellectual and technical background of the field staff, plus a certain weariness with the continued repetition of the same message;

— conversion to the new methods of the more ambitious and open-minded growers, leaving the operation to deal with the hard kernel of population least inclined to take part in an innovation;

— the ability of many peasants, in the new conditions, to cover their own food requirements from their own produce. Thus the main incentive to immediate adoption of the new plan does not now apply;



Service Général de l'information de Madagascar

Rice of Madagascar.

— the low prices obtainable for paddy, which diminishes the peasant's incentive to produce a surplus beyond his own vital requirements, so that he is induced to channel more of his effort into more remunerative cash crops;

— The fact that the government must carry the financial burden of the operation, with or without external aid. The low commercial value of the paddy when it leaves the grower does not enable all or any of the cost of tools and supplies (practically all imported) or the staffing of the operation to be transferred onto the producer's shoulders.

PROGRESS OF THE OPERATION

Nevertheless the O.R.P. has been running for eight years and has been repeatedly adjusted to changing situations, in the attempt to deal with the rough background of peasant life and adapt the financial burdens to the underlying optimism of the initial surveys and the ambitious character of the economic and political objectives.

In the first phase the programme was seeking to secure adoption of the improved cultivation method by the greatest possible number of peasants and over the widest possible rice-growing area. After this it was working at the pre-production end on management and administration, credit and artisan development; and at the post-production end on improving primary marketing conditions. In its third phase it was no longer seeking geographical extension, and its methods were concentrated on improving the quality of application of the new cultivation practice.

There have been changes, too, in the way the operation is organised. In the first years the structure was highly centralised, but this has been followed by a system giving a maximum of initiative to the field posts of the rural expansion units, which provide their management services within the limits of the broad lines of policy laid down for them. In parallel with this, there has been a decrease in the number of engineers on the staff. The methods of popularisation, formerly aimed at the individual, are now concerned mainly on groups.

The operation was originally confined to rice cultivation, but its interventions have now been diversified and are concerned with stock-raising and rain-dependent cultivation. The technical assistance from foreign companies is becoming less as the years go by, and the headquarters staff of the O.R.P. is becoming an all-malagasy instrument.

In the finance conventions between the government and the E.E.C., there are also signs of a desire for change. The first convention was for the initial period 1966-70; and in this the E.D.F. contribution was two-thirds of the total and covered not only the investments and the technical assistance, but also the functioning of the malagasy per-

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sonnel. In the convention now in operation the share of the E.D.F. amounts to only a third of the sums earmarked for the operation, covering essentially the technical assistance and part of the supply cost of production material (small hydraulic equipment, chemical fertilizers, infrastructure and material). All the functional and personnel costs of the operation are borne from the national finances.

The year 1973 saw the institution of the "Fokonolona". It is the intention of the Madagascar government that these should enable the peasantry to play a large part in the development of the country, by giving them a forum to state their needs and wishes, and discussing with official administrative and technical bodies how far these are desirable and how they could be carried out. With the aid of these bodies the peasantry could play an active part in satisfying the wishes they put forward; and this must necessarily lead to another set of changes in the O.R.P. From one point of view the task of the operation will be the easier; for it will be presented with a ready-made "group of peasants" anxious and willing to participate in their own development, which is what it had been seeking from the outset. From another standpoint the task will be made the more difficult; for the desires expressed, under the agriculture heading alone, may well be manifold and conflicting, even in an area which is ecologically homogeneous; and the replies which can be given may imply more advanced technical knowledge than is currently available through the basic popularisation.

In 1966, the O.R.P. was effectively a social contract in very simple terms. It offered tons of paddy in exchange for resources in men and money, suitably employed for a determined end in well-defined areas. We are now far from anything as simple as this. The complexities of humanity and the forces of nature have gained the upper hand.

In contrast to this, the O.R.P. has struck deep roots among the Upland peasantry. Great numbers of peasants owe it to the programme that they have been able to make sure that they and their families will have the necessary food. Many are those who, through the Fokontany, have asked or will ask the programme to raise them to higher cash incomes and satisfy other needs which are no less matters of priority—schooling costs, clothing, housing and much else. They have now an inbred confidence in a popularisation apparatus which, for all its faults and insufficiencies, came as close as possible to the peasant life and thus gave a consciousness of the realities.

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It remains to be asked whether the weaknesses and limitations of a project of this type are such that it should not be used in future for purposes of agricultural development, and should give place to more precise forms of intervention, calculated to give more demonstrable results both in the short term and at predetermined intervals.

The answer would seem to be no. The O.R.P. is in fact a project of the type providing the best help for the traditional peasant populations in their development towards a more modern background, in which they can play their due part in the present political and economic system. This operates in two ways:

— first, by ensuring the subsistence of rural populations and those undergoing rapid urbanisation;

— second, by creating inside the country the market which is needed by the nation's industries and which they are normally obliged to seek elsewhere, with all the difficulties which arise from this. But this supposes that:

— from the very outset the improvement of food cultivation mainly for subsistence should run in parallel with that of cultivation for cash. The latter is intended to produce the cash income needed for the peasant population to advance a step further in their standard of living, by covering the costs of schooling their children and improving the conditions governing their clothing and housing; and also, for covering the cost of the tools, equipment and material they need for their subsistence farming and their cash crops;

— the governments agree to pay better prices for food crops, as an inducement to peasants to cover their own food requirements and those of the urban populations;

— Community aid and other external finance sources maintain their practice of subsidising the cost, and thus lowering the price, of the instruments of production, including fertilizers, insecticides and other material, the prices of which are such a big item in agricultural costs, until such time as the guarantee of remunerative prices to the producer makes it possible for him to cover the whole of his production costs.

It is equally essential that all concerned in development—the financier, the technician and the planner—accept, as does the peasant, that agriculture is a process which goes on forever; and that any attempt at over-rapid change can only be to the disadvantage of the peasant, whose well-being is the true and ultimate objective of all rural development. ■

R. GRÉGOIRE

Rice growing in Madagascar.

How to sell in Europe:
guidelines from West Germany

by Dr HOFER

Being really concerned with efficiency in trade promotion means going beyond general considerations and being concrete. Dr. Hofer runs a buying agency for 600 stores and shops in Federal Germany, and knows his subject. In a speech at the recent Fair for Partners in Progress in Berlin, he drew up several practical rules which should be of real help to businessmen such as the African exporters who mean to put more of their products on the european, and especially the german, markets.

"Experience of product samples from associated markets" is a subject which can be tackled in different ways. I should first restrict its scope and add "from the point of view of large retail firms", for my background, personal experience and present activity—I am a member of the board of directors of a central buying agency for 600 department stores and specialized shops with a retail turnover of something under DM 3 000 million—enable me to speak with authority only on this particular aspect.

If I turned the subject into a question and asked whether the experience of the firm I represent with product samples from associated countries has been positive, the answer would be a straight "yes". However, this immediately raises the question of why our firm in particular has achieved good results, and, if so, whether they were achieved without difficulty. Answering this question in the affirmative involves a further question: can we expect similar success for the future as well?

One of the reasons for our firm's success in this field is undoubtedly that we—like all german firms—can trade with complete independence and that the State does not exercise any form of influence on our business decisions. Another reason is that, like all big german firms which import on a large scale, we have a staff of specialized buyers who have great experience of trading with countries which are generally counted among the less industrialized or "developing" countries. Whether we, or other large trading concerns in Germany, will continue to experiment successfully with products from these associated countries in the future depends on a number of different conditions.

AN EXPORT-ORIENTATED INDUSTRY

One condition is the existence in these countries of export-oriented industry that is both willing and in a position to offer and deliver goods suited to European tastes in sufficient quantity at competitive prices, and which can be relied on to comply with all other contractual terms concerning, for example, the processing of materials, sizes, delivery dates, quantity grading and transportproof packaging.

This first condition is by no means obvious, for it is here that completely false ideas are repeatedly encountered in countries which wish to export but have little experience of the field. As a general rule only industrial products are suitable for export; the performance of a supply market can be measured only in terms of industrial products. However beautiful, expressive of tradition or out of the ordinary handicraft products are, **it is the industrial product which acts as the yardstick for an exporting country's performance.** Traditional craft articles can be imported occasionally, especially where large-scale sales displays are mounted with traditional craft products on show to highlight a particular region, such as Black Africa. But these are exceptional cases. An industrial product is one which can be manufactured, for as long as there is a demand for it, by a technically sound process giving uniform quality, in considerable quantities and at a relatively constant export price for any given season, or in the quantities provided for in the contract including any options.

The industrial product which is marketable in Europe also differs essentially from most of the products which have a market—in other words are used or worn—in the developing producer country itself. Handicraft products in particular belong to the latter category. Items currently used or worn in Europe are—as is repeatedly apparent abroad—virtually unknown in countries with little export experience. The best source of information on the goods which are used in Europe—and here we are already in the field of export marketing—is the comprehensive catalogues and brochures which emanate from a market—in Germany the mail order catalogues in particular. A mail order catalogue, particularly if it is produced by one of the large mail order firms, given an overall picture of the whole market for the current season. It also provides informa-

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tion on fashions, styles, technical standards and prices.

Another way of discovering which goods are suitable for a particular import market is to examine the import and production statistics of the country concerned. These also provide information on the average export prices which competing suppliers charge for given products. The fact that certain products are imported in large quantities reveals gaps on the market. Production statistics indicate the product value (manufacturers' selling price) of manufactured goods in, for example, West Germany. These statistics can be obtained cheaply and are very accurate.

It is of course personal contact with the German importer which provides the best information. This naturally raises the question of how to find this importer. To do so, the first requirement is to examine the manufacturers export policy.

EXPORT POLICY

The export policy of the individual manufacturer must first be looked into. In other words, the exporter has to decide whether he wants to work with a few large retail firms, and adjust his product range, presentation and sales technique to suit this clientele, or prefers to work with a large number of buyers in the importing country in order to minimize his risks by catering to a wide market.

Large retail firms as customers

In this case all that is required is the addresses of the small number of department store concerns, mail order firms and small traders' buying associations, and these addresses are easily obtainable from the Foreign Trade Association of the German retail trade. If the exporter wishes to work with this group of firms he must realize that he will be dealing with central buyers, who are inundated with offers from all over the world and are hard, but also very objective, trading partners. The advantage of working with these few, though very large, firms is that they have their own departments to deal with imports, customs clearance and all related organizational expenditure.

Working with a wide clientele

This approach is initially dearer and in the long run harder to organize. Contacts can be made only at international trade fairs in the relevant importing country; events such as the Frankfurt Fair, the "Interstoff", the "Igedo" or Munich Fashion Week and the Offenbach Leather Goods Fair attract a large number of specialized buyers. The long-term consequence of this sales policy is the creation of an agency in Germany which at the least maintains a modest stock, makes out bills in DM, deals with customs clearance and later on builds up a network of representatives throughout the Federal Republic. If this method is chosen, it is as a rule impossible, or at least very difficult, to secure business with the large retail firms and buying associations in the long term. Supplying a large number of clients also presupposes close familiarity with the market and the existence of a comprehensive product range adjusted to the requirements of the import market concerned.

Let us assume that the countries represented by you want to establish business via the large german firms. In this case, exhibiting at one of the fairs in the importing country is, generally speaking, not suitable, for such fairs are a vehicle for the establishment of good, general contact with potential buyers and for testing the reaction of consumers to a product, while only the Berlin "Partners in Progress" Fair is specifically geared to the buyers of the large companies. Fairs in the producer country must present a convincing range of goods and must have the reputation of being able to give a general idea of the full range of goods offered by the country in question without requiring too much effort, time or expense. The major problem is that a given country is seldom able, at a one-country export event, to offer specialized products falling within a given category of goods in sufficient quantity. What is usually found is a cross-section of the country's industry, and to cover the ground properly each large trading concern would have to send a big team of buyers, which is too costly.

The notion, often encountered abroad, that the buyer must travel to the product is generally false; **it is the product which must come to the buyer.** In addition, time is usually much too short at these fairs for the buyer's particular ideas to be put across to the supplier in sufficient detail for there to be a chance of concluding a deal. In the main a personal visit or a written offer remains the only way of convincing the importer in question of the merits of a certain product.

PREREQUISITES FOR THE OFFER

Exporters in non-European countries must rid themselves of the idea that they have only to produce an article on a large scale to be able to offer it on the world market. Such articles scarcely exist any more. Only very modern, efficient production plant can produce a high-grade product with a large proportion of basic products, but in general production can only be started and the basic product can only be bought if there is a firm order for the product. This presupposes conditions other than the fleeting contacts involved in a casual transaction, as perhaps still happened 20 years ago. Export marketing is a quest for partnership. At a time when cooperation is the order of the day and costly developments can be taken further only by means of joint endeavours, the import and export business requires partnership too, because the inherent risks can only be carried jointly. Let us concentrate on the written offer and outline the conditions to which such an offer is subject if it is to be successful.

Proper lay-out and correct wording

When a written offer is made, it must be so phrased as to include the offer of sale, particulars which are as comprehensive as possible and the expression of the wish to establish future collaboration. Lasting success can be guaranteed only if the importer is made aware of →

the offerer's general productive capacity through the first contacts. The importer will then persuade him to adapt his product to the conditions prevailing in the importing country if for any reason it does not suit the market initially. **The producer's willingness to adjust to the requirements of the market should already be clear from his first letter.**

The information about the product should also state that it is produced in the supplying country in question and possibly that it is selling well there. Information about countries which already import the article—Australia and the U.S.A., for example—is generally useful. In addition to the exact description of the article, German law lays down that the following additional information must be enclosed: the price, graduated according to quantity accepted cif or caf Hamburg; the terms of delivery and payment; the quantities available; the possible delivery dates; where appropriate, further details of alternative styles and colours, and particulars of packaging, textile labelling and maintenance instructions.

It would be a serious mistake for one offer to cover several different articles. Where several articles are offered, **a separate offer must be drafted for each one.**

It is by far preferable **for the offer to be drafted in German or in the language of whatever country you would like to export to,** for a letter written in a foreign language must first be translated; this will be done by people who are not familiar with the business involved and have no interest in your offer. The arguments lose some of their weight in translation. It is also best not to enclose samples with the initial offer, for samples involve customs duties, work and storage—in short, they cost money.

The offer as seen by the recipient

An offer should always **give the impression that the exporter is making a personal approach to the firm concerned.** Mass-produced, duplicated offers, which suggest that they are intended for wide distribution and in which the appropriate address has merely been inserted, have little claim to be taken seriously by large retail firms. The best plan, especially when one does not yet know the name of the central buyer in charge, is always to send the offer to the import department of the firm in question, since the people working in that department know best who the offer should be forwarded to.

Timing

The timing of an offer **must take account of the buying timetable of the large retail firms,** which in turn is based on the major product selections which are made twice a year—in the spring for the following autumn and winter and in the autumn for the following spring and summer. This long-term planning is necessary both for producing and financing the goods and also for making the right choice.

In the case of a winter article or one intended for sale primarily as a Christmas gift, it must reach the potential importer by the end of the previous year for him to be able to market it during the following season. If it is a summer article, it must be offered no later than May or June of the previous year. The buying arrangements of all the large retail firms are based on the following selection system:

❶ Completion of sample procurement approximately eight weeks before the main selection.

❷ A preliminary selection, which is made some four to six weeks before the main selection and brings together all domestic and foreign suppliers and product samples as well as groups of experienced buyers covering all areas of the firm's operation.

❸ Assembly of the samples chosen into a complete range. One can work on the basis that the number of goods brought into the range constitutes between 10% and 25%, depending upon the product field, of all the goods on offer to a large retail firm.

PROSPECTS FOR THE FUTURE

This outline of the partly very technical details of, and prerequisites for, a successful offer was necessary to give an idea of what conditions have to be fulfilled for an exporter on his own to have a chance of establishing an outlet for his goods with a large retail firm in Germany.

I should also like to make one or two points about the situation in general. The once sunny economic sky in Germany is now obscured, if not by impenetrable fog, at least by very threatening storm clouds. Stagnant consumer demand, stagnant retail turnover, fear of short-time working and a cutback in income mean that all large retail firms are less inclined at the moment to take the risk of opening up new export markets for themselves by engaging in the appropriate activities. Do not be deceived on this point by the 38% increase in imports in July compared with the same month last year. As far as the goods markets observed by our firm are concerned, this sharp increase is in no way due to increasingly lively domestic demand but rather to early delivery as a result of an improvement in ability to deliver to all the export markets of the world following a fall-off in demand from the U.S.A. and Canada. It is a consequence of the completion of existing orders and not of newly contracted deliveries.

In future, it will be even more difficult to do successful business in certain products with large retail firms in Germany. There is no doubt, however, that the highly industrialized countries are developing towards post-industrial forms of organization, which means that the old economic principle of comparative costs will be even more applicable than in the past, and it goes without saying that the enormous production possibilities of the Third World can fit into this process.

My cold statement of the difficulties is by no means intended to discourage an exporter who wants to make Germany and the large retail firms his clients. A realistic approach is necessary, and it should help you and us to avoid mistakes and make business relations as pleasant as possible in the future as well. ■

Dr. HOFER

Postgraduate international courses in the Netherlands

by E. JONGENS (*)

The history of the Dutch academic system for international education begins shortly after the Second World War. It was in that period that the need for more and better education in the developing countries became clear, that the United Nations and its specialised agencies began to shape plans for development aid and that large numbers of students from these countries registered in universities in technically developed countries in order to obtain the training their own countries could not yet offer.

From this stream of students flowing from Asia, Africa and Latin America towards Europe and North America around the end of the forties, the Dutch universities received only a very modest share. This is easy to understand. In the first place, there is the language barrier. Anyone wishing to study at a Dutch university must know Dutch and our language, unlike English or French, simply is not used in most parts of the world. In the second place, the structure of the study programmes in our universities differs from that in many other countries. We are accustomed to a long period of study (seven or eight years against a much shorter period in many other countries); we recognise a first degree, at the undergraduate level (the candidate's exam), which, unlike the bachelor's degree for example, does not assure entry to positions of substance in society. Speaking generally, our system of academic degrees may only with difficulty be compared with, for example, Anglo-Saxon degrees. Our academic degrees, with the exception of that of doctor, therefore do not really appeal to the foreigner.

Three initiatives since the start of the 1950 s

The fact that the Dutch universities attracted so few foreign students, in contrast to those in countries such as England, France, Germany and Switzerland, led in the early fifties to three initiatives.

The first step was taken by the Minister of Education and Sciences who, at the insistence of the universities, formed a broadly-based committee to enquire into the manner in which the Dutch universities needed to adapt themselves to the rapidly changing international requirements. The conclusion was that a new institute should be created, where education would be given to, and scientific research carried out by, mainly foreigners. It would be active in the realm of the social sciences. English would be the language of instruction.

In order to bring the plan to fruition the Dutch universities together established the **Netherlands Universities Foundation for International Co-operation** (N.U.F.F.I.C.). The **Institute of Social Studies,** set up by N.U.F.F.I.C. in 1952, still has a very important place among Dutch institutions for international education.

The second initiative was taken at the same time by Professor Schermerhorn who, in contacts with the United Nations, had found that cartographic data were of vital importance to the developing countries. Thanks to his efforts, in 1950 a training centre for the application of aerial photography was established by the **Delft University of Technology** and the **Agricultural University at Wageningen:** the **International Training Centre for Aerial Survey,** later renamed the **International Institute for Aerial Survey and Earth Sciences** (I.T.C.), for some years now located—and thriving—in Enschede. The third initiative early in the fifties came from Agricultural University circles and led to the establishment in 1951 of the **International Agricultural Centre,** which, among other things, was charged with the task of organising international courses in agricultural subjects in co-operation with the Wageningen University and other agricultural institutes.

Other ideas followed

An archtypical scientific field, in which the Dutch had gained experience down the centuries, was that of hydraulic engineering. As a result of the co-operation between the Delft University of Technology and N.U.F.F.I.C., in 1957 the International Course in Hydraulic Engineering was born, to which Sanitary Engineering, Hydrology, and Environmental Science and Technology were later added.

The most important institutes and courses which were established afterwards are, in no special order:

— the Research Institute for Management Science, sponsored by the Delft University of Technology and N.U.F.F.I.C.,

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(*) Head, Department of International Education, N.U.F.F.I.C.

organising courses in—among other things—the management of small-scale industries;

— Bouwcentrum International Education, set up by the Bouwcentrum, Rotterdam, and N.U.F.F.I.C., organising courses in housing, building and planning and quality control;

— Philips' International Institute of Technological Studies at Eindhoven, with a programme in electronic engineering;

— Philips' International Telecommunications Training Centre at Hilversum in telecommunications;

— the International Union of Local Authorities in The Hague, which organises courses in local government administration and

— the International Course in European Integration, set up by the University of Amsterdam and N.U.F.F.I.C. Unlike the other courses, this one is not primarily concerned with the developing countries.

Two international courses were set up by N.U.F.F.I.C. in collaboration with university and non-university institutes in Belgium and the Netherlands. They are: the International Course in Health Development and the International Course in Food Science and Nutrition. The medium of instruction in both courses is English **and** French. The French section of the Food Sciency Course is the only course of this type in the world.

A wide variety with points in common

From this summary it will be clear that since 1950 a large number of these special institutes and courses have been set up. This by no means occurred haphazardly in only one or two places; the postgraduate educational body especially intended for persons from the developing countries and mainly directed to the needs of those countries and their peoples has been established in many places in the Netherlands down the years. This is known in other countries too (Sweden, Rumania, Italy, the United Kingdom, to name a few), but nowhere has it become so widespread as in the Netherlands, so prevalent in fact that one is justified in speaking of a system of institutes of international education.

This does not imply, however, that there is a strong connection between these institutes and courses. On the contrary, the fields in which they specialise vary from case to case. Constitutions differ markedly, as do relations with the universities where they arise. Each maintains its own connections with the Dutch government, the international organisations and the developing countries. They are, in fact, very independent, difficult to incorporate into a system. A certain unifying element for a number of them is formed by their connections with N.U.F.F.I.C., the financing through N.U.F.F.I.C.'s budget, or the appointment of the directors of the members of the board of trustees by N.U.F.F.I.C. While the forces tending to keep this system of international education divided should not be underestimated, the attributes common to all sections forming the uniting element are stronger than those which tend to keep them apart. To cite a number of these similarities: In the first place, there is the common purpose, within the framework of which work is especially done for persons from developing countries, following a programme mainly designed to meet the needs of those countries and their peoples. The efforts of these institutes therefore form a part of the Dutch programme for international co-operation. The institutes derive an important part of their financial support from the funds intended for development co-operation. It is not only the Minister of Education and Science (of or Agriculture and Fisheries, in the case of agricultural training) who is concerned, but also to a large extent the Minister for Development Co-operation. →

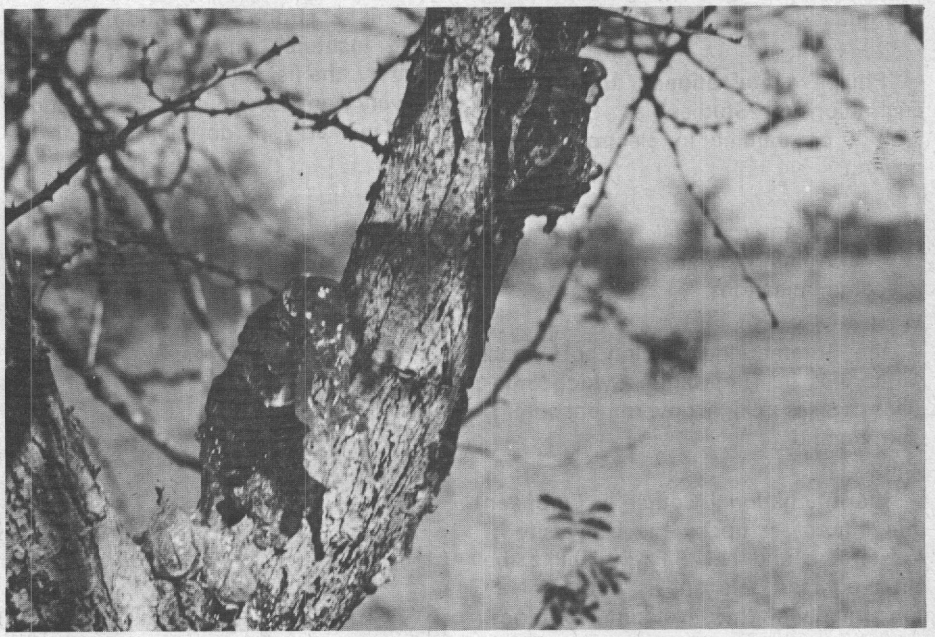
(see page 88)

Radium

The discussion opens on industrialisation. These trainees have been round a rubber processing plant at Maastricht (Netherlands).

Chad

Production of gum arabic



Gum oozing out of a natural cut.

General. Though gum is produced by several species of acacia, the product commercially known as gum arabic comes only from Acacia Senegal (Willd). Acacia Senegal is a native of the thornbush savannah country in the Sahel area, where the annual rainfall is between 200 and 500 mm. It prefers hot, light, sandy soil, particularly old compressed dunes where it often forms dense thickets. It grows well on fallow land which has been abandoned for agricultural purposes.

In Chad, Acacia Senegal is to be found in a strip of country between the 200 and 500 mm rainfall lines, stretching across the whole Sahel area.

Production. Acacia Senegal has two production seasons, October-December and March-July. Its productivity depends on temperature and the humidity of the air.

The flow of the gum begins and quickens with rising temperatures in air and soil, reaching its peak when conditions are very hot and dry, and slackens with a lowering of temperatures and increasing air humidity. During the season of rains, and through the fresh months of the winter season the flow stops.

Abundant rainfall in the previous season has an evident effect on the growth and productivity of the tree.

Cultivation. Though the gum flows naturally from a chance lesion in the tree, cultivation is carried out by tapping. Incision is made in the outer layer of the bark of the branches, and a strip of about 3 cm in width and 30 cm in length is removed. The gum exudes from these cuts in the form of drops which coagulate into balls which may be several centimetres in diameter. The gum may continue to exude in places where the first balls have been removed. If the tapping is properly done the wound in the bark heals quickly, and the tree can be tapped again next season. The gum is gathered and marketed without any further processing, apart from some sorting and packaging.

Care of the tree. Apart from the tapping and gathering of the crop, the care of a gum plantation consists of protection against bush fires by ditching and against animals by protective hedging.

Improvement. The improvement of trees of natural growth includes the following operations:

1) Protection from fire and animals in such a way as to promote natural regeneration.

2) Increasing the number of trees per hectare, by direct additional sowing after soil preparation.

3) Controlled operation, avoiding excessive tapping.

Added to these in village neighbourhoods is the setting up of artificial plantings by direct sowing on fallow ground.

World production. The world production of gum arabic is concentrated in the countries in the Sahel area south of the Sahara. The chief producer is the Sudan, which produces between 75 and 90 % of world production. The other producers are: Nigeria, Senegal, Mauritania, Chad, Niger, Mali and Tanzania.

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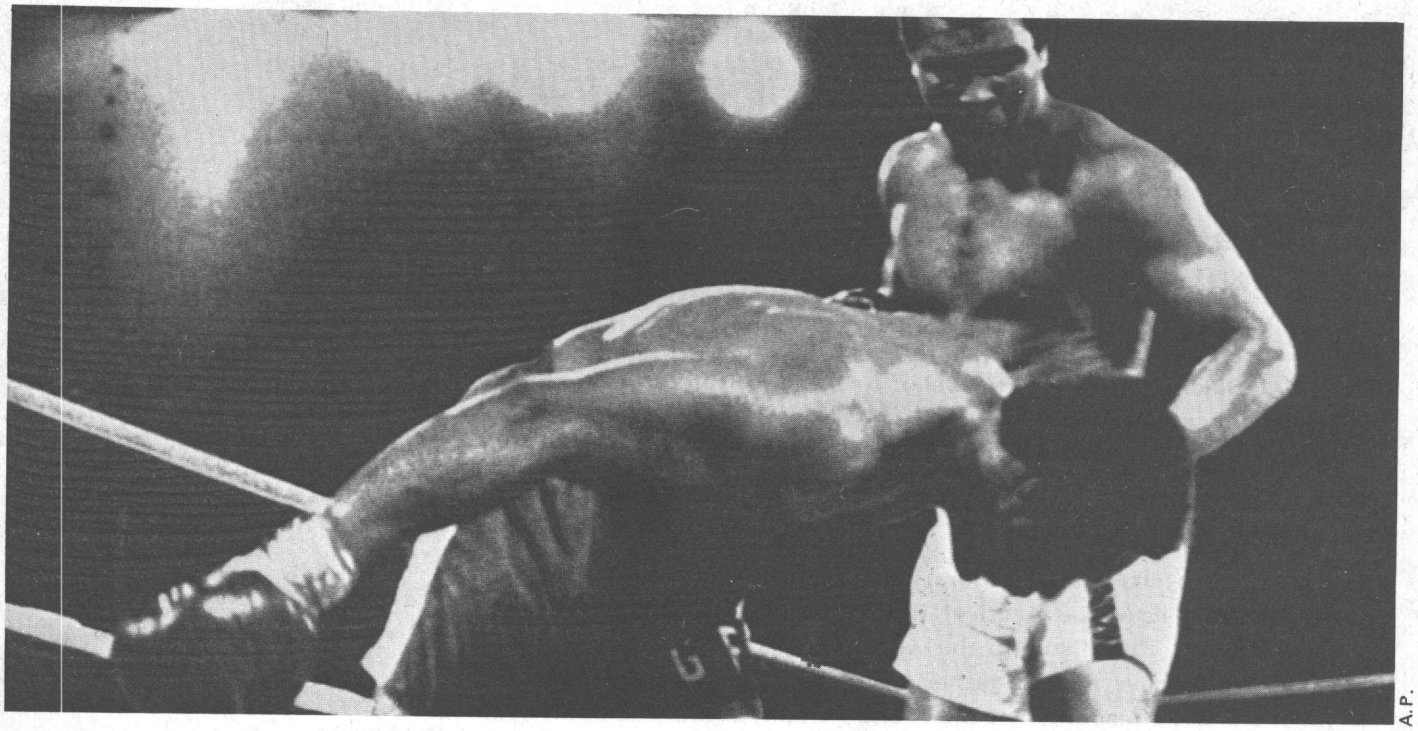
(see page 88)

The material used under this heading is taken principally from the reports of E.D.F. delegates in the A.A.S.M.

Mohammed Ali: Champion for all time



A.P.

A champion (Foreman) hits the canvas and a super boxer (Mohammed Ali) triumphs.

Mohammed Ali — otherwise known as Cassius Clay — has regained his laurels as heavyweight champion of the world. He did this on October 29, 1974, when he knocked out George Foreman in the 8th round. It was a master achievement worthy of the greatest champions of all the ages. Seven long years ago, Mohammed Ali had lost the title to Joe Frazier, and in the long history of the Noble Art, Floyd Patterson alone had staged such a comeback.

Clay's defeat of Foreman in Kinshasa (Zaïre) has revived interest in heavyweight boxing which, let's face it, had tended to flag since he left the ring in 1967. There were in fact some fantastic partisan comments on the match; but for all this we must take off our hats to the new champion of the world who, at the ripe age of 32, showed his 25-year old adversary that victory goes not to brawn alone, but to intelligence and ringside support.

Clay's form and fitness was outstanding; but the first lesson to be learned from this world championship bout is the part which is played by the psychological preparations of the victor. Cassius Clay has always spoken up for the American Blacks, and in this capacity he is known and recognised. During his time in Zaïre he gained a major advantage by organising a big campaign of moral bludgeoning against George Foreman. After the fight there seemed to be no doubt that this psychological campaign affected the issue of the combat as decisively as did Mohammed Ali's style and skill.

It is not only public interest in heavyweight boxing which has been revived by Ali's victory. It has done much, too, for the boxing business, for there is already talk of a return match against Foreman. This, if and when it happens, will be double or quits; and in the meantime, there is talk of a bout between Joe Frazier and Mohammed Ali. One of the conditions, however, is that Ali's purse be raised to "ten million dollars". This is the tribute the new champion can now demand for climbing into the ring. ■

Lucien PAGNI

47 FIGHTS, 45 WINS, TWO DEFEATS

His spectacular victory over George Foreman makes Mohammed Ali's record: 47 fights; 45 wins, 32 of them within the distance; and two losses on points, against Joe Frazier and Ken Norton, both of whom he beat in a second encounter.

It might be a strange coincidence that Ali became the new world champion in the eighth round against George Foreman—all his fights until then had gone an overall average of eight rounds. So the average holds good, and Mohammed Ali has boxed brilliantly through a total of 379 rounds since his professional debut in 1960. *(L'Equipe)*

From the London meeting to the World Black and African Festival of Arts in Lagos 1975

Interview with Earl Cameron, Chairman of the U.K.A.F.C.[1]

The World Black and African Festival of Arts and Culture is being staged in Lagos, the capital of Nigeria, from 22 November to 20 December 1975. The Lagos Festival is the second of its kind. The first was in Dakar in 1966 where the theme was, more simply, negritude, what it means to be black.

The Lagos event will of course be "black". But it will be more. It will go beyond a purely intellectual consideration of the many shades of black and put greater emphasis on the practical, down-to-earth, everyday aspects of Black Civilization. This is true to the wish of the Organization of African Unity (O.A.U.) to have regular gatherings of "the substantially untapped cultural and artistic resources of Black and African Communities all over the world to enable them to contribute more significantly to mankind's resources of arts and culture".

Preparations for the Lagos Festival are well advanced in Africa, in America, in the Caribbean and, of course, in Europe.

The UK African Festival Committee "U.K.A.F.C." organized a festival of arts and culture at the Commonwealth Institute in London from 16 September to 5 October 1974 to select the hundred or more artists who will represent the UK in Nigeria. The programme was very varied—traditional dancing, formal (usually called classical) dancing to Black music, reggae (the Caribbean way of life transposed to the United Kingdom), afro-reggae, soul, pop, dance drama and films, poetry and plays—particularly farce—the comedy which is a fundamental part of all Black cultures. It was a resounding success.

The Lagos Festival will be of vast importance not just for Africa but for Europe, America, the Caribbean and Australasia as well. Culture can bridge the gaps between one man and another and bring about greater mutual understanding. Earl Cameron, the Chairman of the U.K.A.F.C. is convinced of this, as he explained in our talk together:

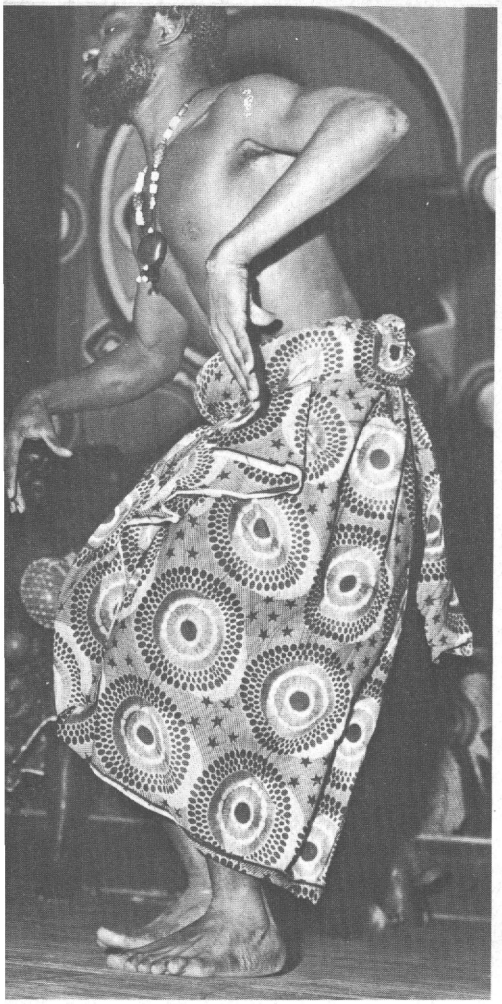
(1) United Kingdom African Festival Committee.

Abey Photo. — S.A. Ashaye

The Oboade dancers performed at th

▶ *What is the object of the Lagos festival?*

The main purpose of course, and of the festival which started in Senegal in 1966, was to bring Black people together throughout the planet, for them to realize their own culture, their own wealth of culture and that they might, so to speak, re-establish themselves on the planet and look forward in the future to being among the leaders instead of lagging behind, which we cannot deny we have been over the past few hundred years. So this festival is aimed at that mainly—that we may be uplifted, recognise our own culture and not always have to mimic the European type of culture. Not that I have anything against European culture, they have got what they have got and we have got what we have got. But we should respect our own culture.



Festival of Black Arts in London.

▶ *What do you find to be the most important themes behind the work displayed at the London exhibition?*

We are now winding up the first festival that we have had three months ago. We have not had any drama yet, but we hope to have in the early part of this year; and we have not had our art exhibition which we will be having at the Serpentine Gallery in February/March 1975. But we had during the first two weeks groups of different kinds of music, many outstanding artists such as Cab Kaye, a group called Simundy, Elaine Delmar, Funkees, Ginger Johnson and his band, Madeleine Bell, Oboade, Lance Setton, the Majestics, Desmond Dekker, who is a tremendous artist, all these people have been giving their services and we have entertained a large percentage of the people in and around London over that period. It has been a musical experience which we have all enjoyed. Out of this we have discovered that here in England, where we Black people have only been in very large numbers for the past twenty years, there is emerging a lot of very rich talent, especially on the stage and in music. In the literary field too, we have had two nights of poetry reading and it has been quite something to sit there and see all this wealth of culture coming through. The last nights we were having dancing. It was not accident that among them there are some outstanding dancers, as you saw for yourself. This festival has had a lot of ups and downs, it's had a lot of problems, it hasn't been easy to put on. I think we are one of the first of the many zones around the world that has done the festival. I don't know how many areas have done the festival but I know the United States have not yet had their festival, neither has Europe. At least we have had our mini festival, and we have searched around for some of the best talent; we have managed to get most of it, we still hope to have other promotional shows over the next few months and other people who have not appeared will be appearing again. It's been a great, great experience.

▶ *Dyane Gray-Cullert, an American Black dancer, said Black people had been ignorant of their own culture for a long time because it had been a policy of Western society to fight and destroy that culture. Are there now grounds for talking of the full reestablishment and affirmation of the Black man and his culture?*

Yes, I would agree with that completely. We being a people that have come from a very rich part of the world, I mean rich in natural resources such as Africa, this was very attractive, let's face it, for those from the poorer parts of the planet like Europe, poor again in terms of natural resources. Seeing Africa's such a prize they knew that in order to exploit the country, exploit the people, they had to rid them of their own heritage, their own background where they might easily become ashamed of themselves. So they started on the culture, to get rid of that by making them feel that the kind of music they're playing or the sort of paintings they have are just child's play. And they have raped, literally raped, the continent of their great art work, as you

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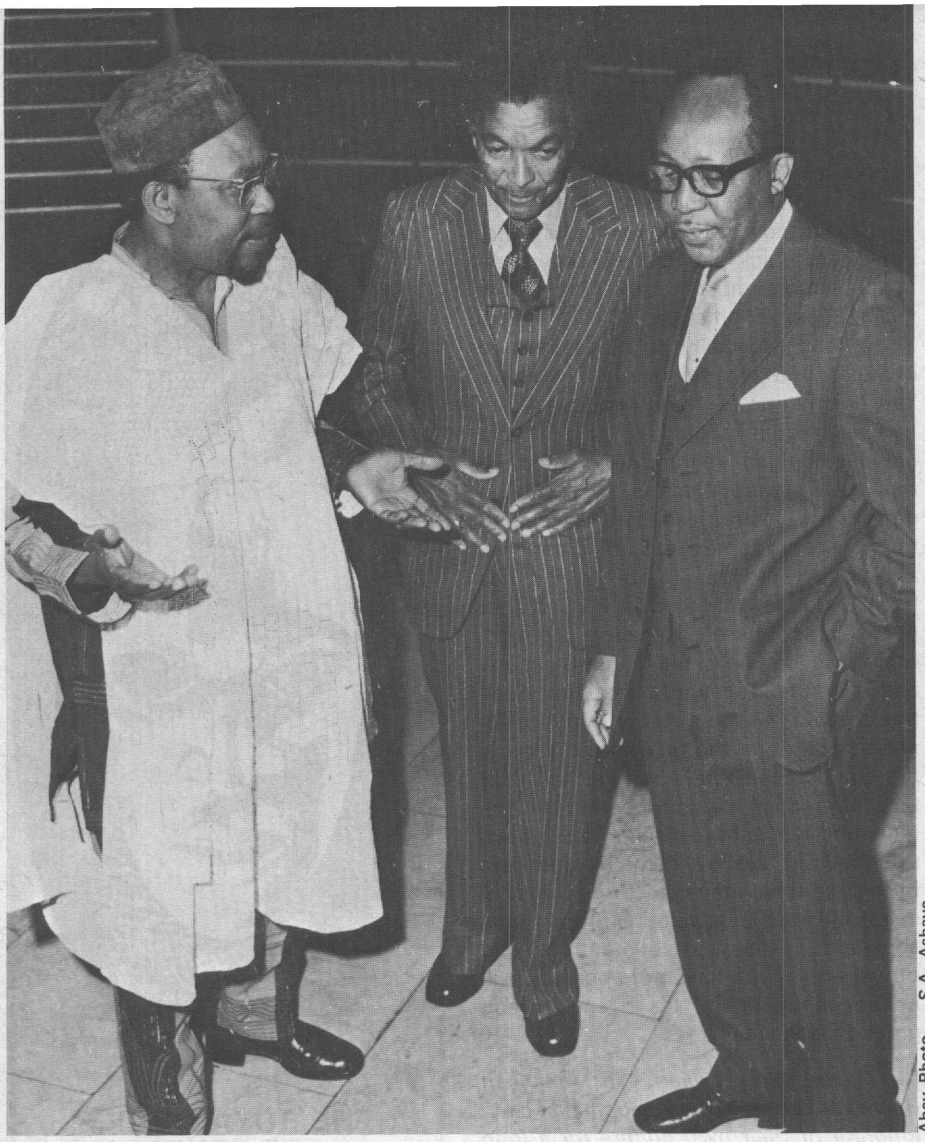
THE ROYAL IVORY OF BENIN

This 16th Century ivory mask from Benin has emerged through the years as one of the finest examples of known African and Black art.

It was worn as a pectoral by Benin Kings on royal ancestral ceremonial occasions; was last worn by King Ovoramwen who was dethroned at the fall of the Benin Empire in 1897. The same year, it fell into the hands of the Consul General of the Niger Coast Protectorate, Sir Ralph Moor, and now rests in the British-Museum.

The tiara formation at the crest of the mask is made of 10 stylised heads and symbolises the King's divine supremacy and suzerainty.

The two incisions on the forehead which were originally filled with iron strips are royal tattoo marks. Round the neck, the artist has carved the coral bead collar which is a common feature of the King's paraphernalia.



Abey Photo. — S.A. Ashaye

r. to l. Mr. S.D. Kolo, Ambassador of Nigeria in London; Mr. Earl Cameron; Mr. L.E. Scott-Emuakpor, Information Counsellor at the Nigerian Embassy.

know. First, they themselves don't even realise the value of this in their ignorance and there is a very destructive attitude of just taking; they have literally debased us as a race, there is no doubt about it in terms of culture. Now in this new age, this twentieth century, we are beginning to open our eyes to what we are and what we have got and this festival, starting with the Dakar Festival in 1966 and the Lagos Festival in 1975, will indeed be an opportunity to show to our people throughout the planet—and that's as far away as Australasia, like the people in Papua New Guinea, Fiji, the Aboriginals of Australia, all of those areas, throughout the South American and North American continent and the Caribbean and wherever there are Black people—let us realise that we are on the planet, that our place on the planet is as important as any other group, any other race, any other lot of people, and we must indeed build ourselves up and understand and respect each other. And we'll only respect each other when we understand our own culture, our own background. People coming from, let us say, Brazil, coming to Nigeria or seeing a Ghanaian group of dancers, will see the identity and feel and recognise and realise that this is a depth of solid culture going back thousands of years. So we need not any longer feel to some degree ashamed of what we have.

▶ *A great American musician once said one could enjoy "Soul" music but could not understand it without being Black. I wonder if this applies to the cinema? Black film-makers have been influenced by american methods, for example the use of the ellipse, very different from those they might otherwise have employed. Can films reflecting a really "Black" sensibility be made from Western techniques and intellectual and literary stances?*

That's a very good intricate type of question. First let me say that I do not believe in separation, I believe first of all that art as it is is one in the same sense

JIMMY CLIFF:

the time has come for us to unite

▶ *Jimmy Cliff, the Jamaican National Dance Theatre Company was to order some special productions from you for its forthcoming dance season. Could you tell us something about it?*

Yes, well this was done, I went out specially for the occasion to see this and I was pleased about the whole thing. Mr. Rex Nettleford is the head of the National Dance Theatre there and it was his idea to take some of my music and put it to dance. Now to me this was really something to talk about and to see in my career, because I am from the ghetto part of Jamaica and so my songs and my music reflect that kind of living, and the National Dance Theatre is not really of the ghetto in Jamaica. The people who go to the National Dance Theatre are the upper class people of Jamaica; my music was coming from the ghetto and going up to those people and they recognise it. So it was an honour and I must give thanks, and a lot of respect is due to Mr. Nettleford whose idea it was to do this, because I've never met this man and he just heard my music and thought he wanted to do this and he himself is a very respected artist and well respected man. And for him to do this never knowing me, to me that was something, it was an honour in our country.

▶ *Your composition "*Many Rivers To Cross*" from the film "*The Harder They Come*" is very well known. What is this song about?*

"*Many Rivers to Cross*"—you could see it in a singular sense or in a plural

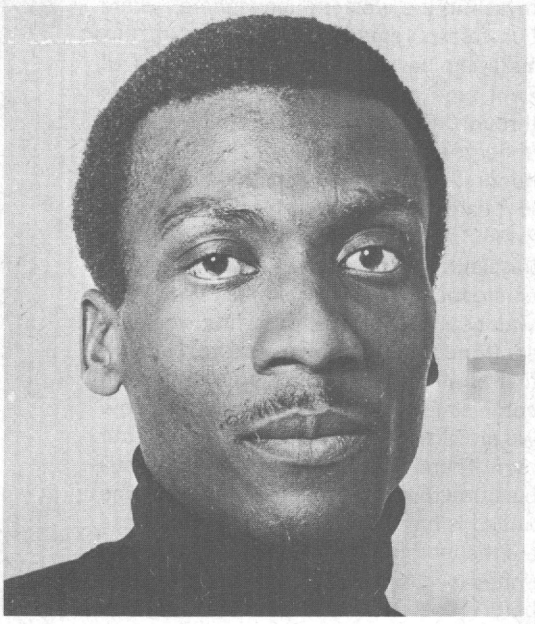
I'd heard a lot about him even before I met him in London. Him, that's Jimmy Cliff. He's a Jamaican, a singer and writer of words and music who's been living in London since 1965. Over there any fan of black music or just plain pop knows Jimmy, even without being a regular at the Hammersmith Palais or the Rainbow Theatre where Jimmy does a lot of singing.

He's been singing since he was a child at school. He cut his first disc at fourteen and a half and almost straight away, at fifteen, he brought out his first hit—" Hurricane Hattie".

He writes his own songs. On the popular themes of the black man everywhere—his lot in life. They reflect Jimmy Cliff's life, but above all they reflect the life of every black man.

Rex Nettleford, Director of the Jamaican National Theatre's Dance Company has said how great an impression Jimmy's intelligence and talent have made on him.

There is no doubt that Jimmy Cliff is outstanding—and this goes for his humanity too. It comes over very clearly when you are with him—you can tell from the way he answered our questions.



Jimmy Cliff
singer and song-writer.

sense. In a plural sense, you could interpret it in many ways. Most of my songs are dealing with struggles and fighting against oppression and reaching out to some sense of form of freedom and peace of mind. So *" Many Rivers to Cross "* was really dealing with that, and the people who can associate with a song like *" Many Rivers to Cross"* are the majority of people in the world who are in this kind of condition, who are reaching out for some kind of freedom. So you know, you have some place to go and you probably think of it in terms of rivers, in terms of bridges, in terms of mountains—there are obstacles in your way but you know you have to go there and you are searching in yourself for an answer. The words of the song are *" Many rivers to cross but I can't seem to find my way over"*. I have heard interpretations which fit as well; of people thinking of it in terms of we Black people, who have been taken from our native land in Africa and across to the western hemisphere, which is many many miles over the ocean. This interpretation also fits.

▶ *I suppose you will probably be going to Lagos. Could you give us an idea of the repertoire you will be taking to the World Black and African Arts Festival?*

I will be going to Lagos, and Nigeria really instead of just Lagos. It's not a hundred per cent certain that I will go to the Black African Arts Festival. I will be going to Lagos because in Nigeria I am very popular, mainly in West Africa I'm very popular. So I will be going there even if it isn't for the Lagos Festival. The repertoire that I will be taking is the most popular things there by me, what the people are looking for, so it really would be mainly things like *" Struggling Man", " Many Rivers to Cross", " Wonderful World" "Beautiful People", " Harder They Come"*, and so on. These are some of the main things—this is something I'm looking forward to very much.

▶ *What are you working on at the moment? Are you bringing out a new record in the next months?*

At the moment I am working on a new album entitled *" Fight On Brave Warrior "*, and this will be coming out, well, within the next few weeks, at least in England. I'm happy with the way it's going—so far. It's a different album from what I think people will expect from me but it's an album that so far I'm very pleased with. That's what I'm working on at the moment and that will be out shortly.

▶ *Jimmy, if you were asked at Lagos whether you had a message to give the world as an artist, what would you say?*

Well if I was asked in Lagos if I have a message to give the world as an artist I would say this: the time has come for us to unite, to be brothers in reality as we really are brothers. The time has come and it is for us to realise the time and we will be realised. ■ *Interview by* **L. P.**

that God is one, religion is one, mankind is one, so there is no real separation. This is just an apparent separation, to say whether one would use Western techniques in making films in order to project our inner self. Whatever techniques there are at the moment will be very primitive in 30 or 40 years time because of science. When we're speaking of technique we are speaking in terms of scientific technique, so we will use all sorts of methods. Indeed I feel at this stage of history especially it is very difficult for, let us say, a white director or a white writer to write for Black people or to direct Black actors. He can do a pretty good job but it is better written and directed by a Black director because it's a closer identity. He knows what the actor feels and he knows what he's trying to portray—like this question about the Blues: indeed white people can perhaps enjoy Blues, but they cannot truly understand it, I mean Soul music, and so on. I would go along with that, but there again I think that this is mainly because of the age, the period of history that we are living in.

This so-called Soul music comes out of something like three to four hundred years of suffering. Black people have suffered through oppression, especially from America, and one knows the background of all the Black people including

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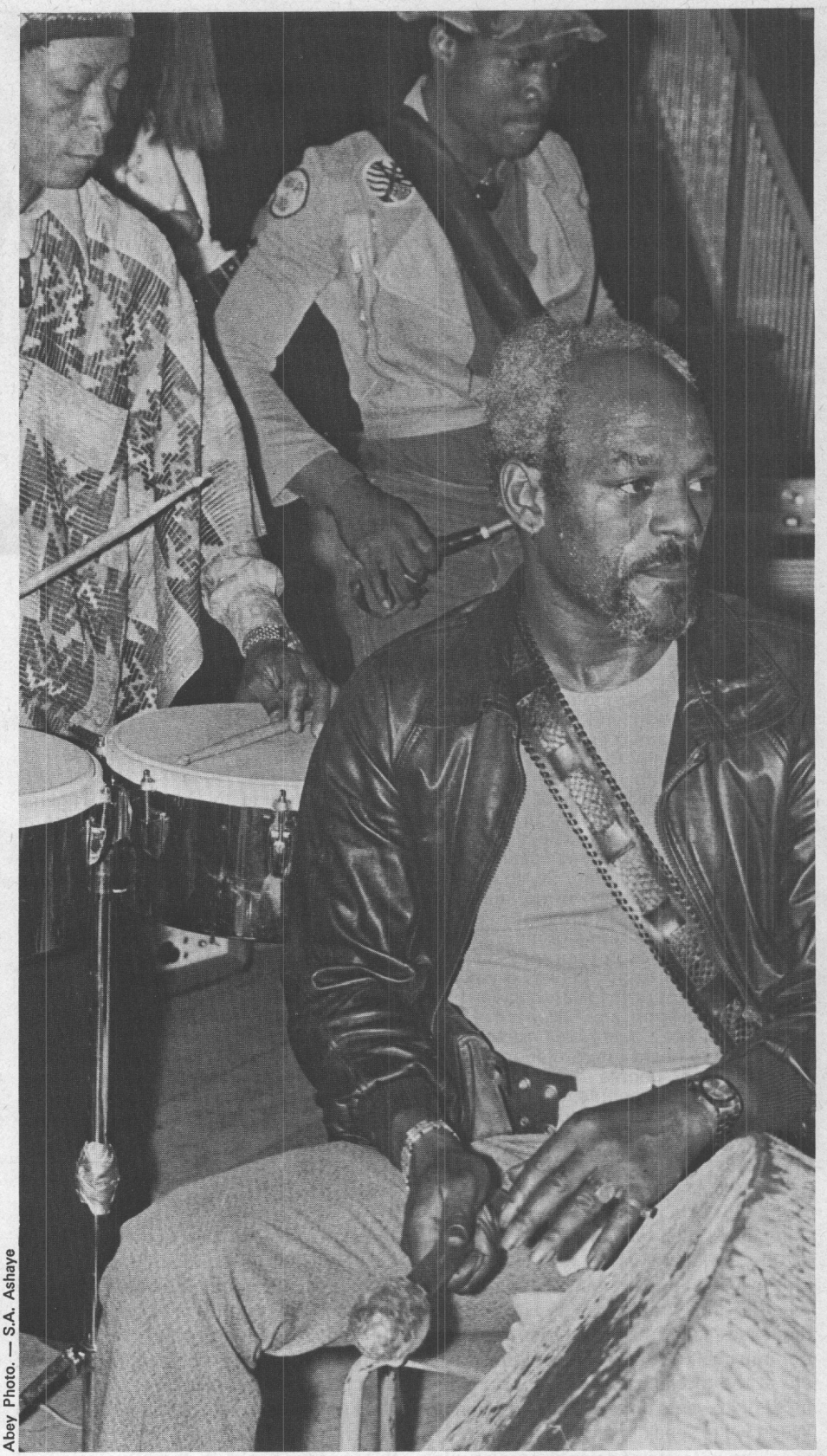
myself in the western hemisphere, where our fore-parents were slaves. So this suffering has brought out this depth of Soul type music, and it's beautiful. It's through this very suffering that we have undergone over the past three to four hundred years that something is going to create a new type of black person and future, starting with this century. Before this century is out we will see the greatest emergence of our people. We have watched it over the past fifty years or so from the beginning of the century, first of all slavery being thrown off, then colonisation being tossed away, and now we are slowly but surely coming into our own. There are many many teething troubles, and the hard way of trying to become united is an awful hell of a job. But these are the teething troubles, we will become united and we will shine like a beacon before this century is out; and we see already country after country in Africa trying to deal with its everyday problems. It's tough because it's the age we're living in, what you might call a very disuniting age; all the forces of disunity are literally eroding the planet and wherever you look, whether it's in this country here among the English or the French or the other Europeans, they're all so terribly disunited. You know for yourself, you are at the Common Market and they cannot agree on anything. And it will not be successful, the Common Market is doomed to failure. Because it's not the answer to unity. The whole planet has to be united. When one person is affected on this planet it must affect all, so when one nation, whether some little so-called insignificant nation somewhere in Asia, or wherever it might be, suffers a flood or an earthquake or anything terrible, if the rest of the world ignores it, it will sooner or later catch up. We are one body of humanity on the planet and we must save ourselves.

So getting back to this film question, I cannot divide art really, but I can say at this stage of history that I would rather see a film directed by a Black director, written by a Black director and even the very cameramen all Black because I know that they will all feel this thing that the Black writer is trying to put across and they will be able to get the thing across much better than a White director, who some way or another cannot quite feel our, I hate to use the word problems, but in this case I would say problems.



Abey Photo. — S.A. Ashaye

The Ginger Johnson Band.

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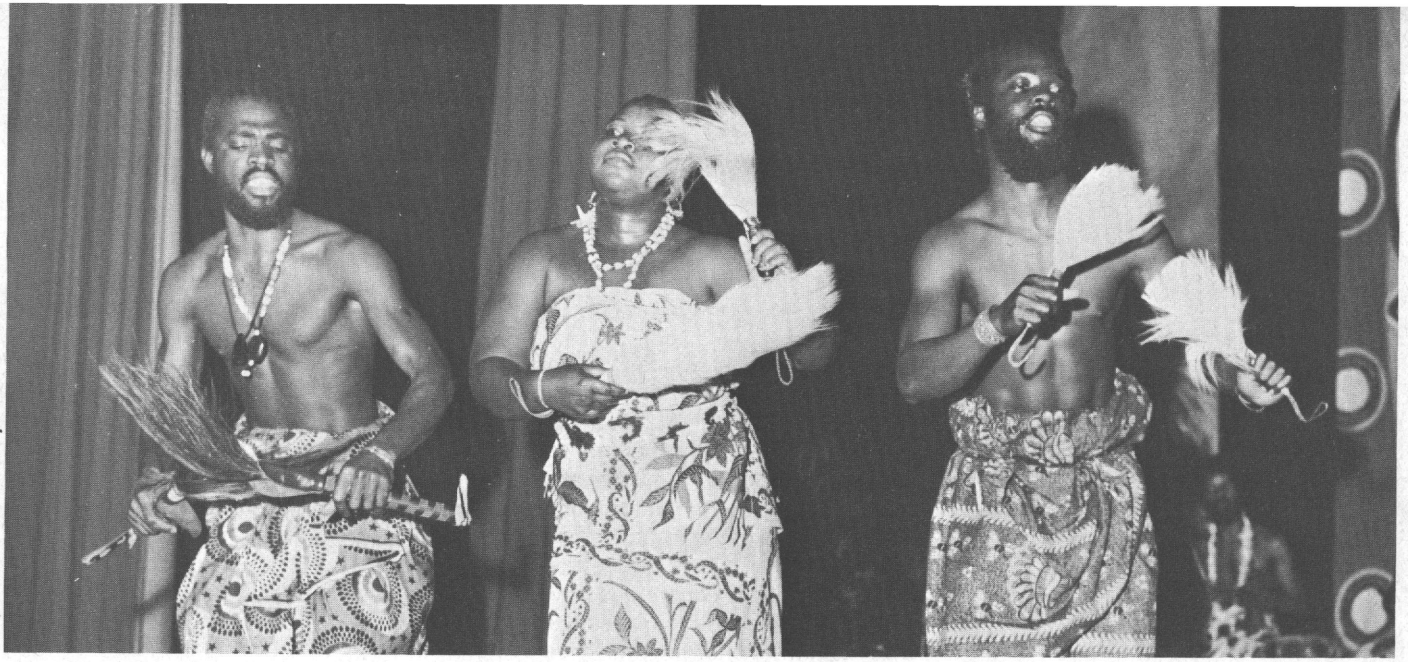

Abey Photo. — S.A. Ashaye

Another number by the Oboade dancers.

▶ *Earl, getting back to the international festival in Lagos in November/December 1975, do you feel that it will be a great success?*

Yes, indeed I do feel it will be a great success. Because this festival, like the first festival in 1966, this second Black African Festival of Arts which is taking place in Lagos in November/December 1975, is in my true belief divinely inspired. As I was saying, the importance is that Black people are getting to know each other, understanding each other regardless of the part of the planet we are from. When we get to this depth of understanding we will be able to understand even better the rest of humanity, but we must first respect each other. So I feel that it is divinely inspired and has brought this about, that we should recognise our true wealth which we have not been doing in the past. The very school books that most of us have read in different parts of the world have made us ashamed of our heritage and our background. I mean, let's take the child in America or the West Indies 50 years ago at least, who was brought up by school books to feel ashamed to say that his Daddy was originally from Africa. That's a terrible thing to do to an individual, to a child. They grew up like that, so the old timers on the planet even now have no connection with the young people who want to return to Africa. They want to go there, to see what life is like. So, it'll be a great success indeed. ■ Interview by

Lucien PAGNI

COUNTRIES TAKING PART

The following are expected to take part in the World Black and African Festival of Arts and Culture:

- All the independent African countries, plus the Liberation Movements from countries still under colonial rule: Mozambique (FRELIMO)—unless Mozambique becomes independent before June 1975; Angola (M.P.L.A., F.L.N.U.); Zimbawe (Z.A.P.U., Z.A.N.U.); Namibia (S.W.A.P.O.); South Africa (A.N.C., P.A.C.); Sao Tomé and Principa Islands (M.L.S.T.); the Comoro Islands (due to become independent in 1975); Seychelles (S.P.U.P.).
- Independent and non-independent French-, English- and Dutch-speaking countries of the Caribbean and Pacific.
- From Europe (1): France, the Federal Republic of Germany, the Netherlands.
- From North America (1): the United States, Canada.
- From South America: Brazil, Ecuador, Colombia, Venezuela, Panama, Peru.
- From Australasia (1): Australia, New Zealand, Papua, New Guinea, India.
- And from all other Black Communities in the rest of Europe and the West, making 71 countries in all.

THE FESTIVAL COMMITTEES

Organization of the 1975 Lagos Festival will be by an international committee. Two men of mark—Léopold Sedar Senghor, the President of Senegal and General Yakubu Gowon, the Nigerian Chief of State—are nominal members of the committee although they will not attend meetings. They will be kept in the picture by the President, Chief Anthony Enahoro, the Nigerian Federal Commissioner for Information and Labour.

The Festival Committees for the various zones are as follows:

International Festival Committee: Festival President, Chief Anthony Enahoro, Nigerian Federal Commissioner for Information and Labour.

South America: Professor G. Alakija (Brazil).

Caribbean: Miss Shirley Field-Ridley MP, Minister for Information, Culture and Youth (Guyana).

North America: Ossie Davis, film producer (U.S.A.). This committee, with 22 members, is one of the largest.

United Kingdom and Ireland: Earl Cameron, actor and producer (U.K.).

Europe: Maître L. Boissier-Palun, avocat à la cour (Paris), and deputies from Federal Germany, the Netherlands and Austria.

Australasia: Moses Sasakila, Minister for Cultural Affairs (Papua New Guinea).

In general, the Festival Committee in each African country and Liberation Movement are under the Chairmanship of the Minister of Culture.

A NEW THEATRE

Reception facilities, including a huge new theatre and a cultural complex, are being built for some 25 000 artists, directors and accompanists of troupes coming from 71 countries to take part in the Festival. These facilities cost more than $40 million in all. International interest in the event has been so great that the Nigerian Government is building a Festival Village in Lagos to house at least 100 000 visitors from Africa and further afield.

The United Kingdom African Festival Committee will be organizing charter trips at low, all-in prices for more than 7 000 visitors from Great Britain, Ireland and Western Europe alone.

(1) The countries in these zones having a large number of Black citizens.

International courses in the Netherlands

(from page 79)

The institutes of international education are all characterised by the international composition of their student body, if we may use the words "student body" for a group of participants whose age and experience fits them more for the system of recurrent education that the future has perhaps in store for all of us than for a place in the student population of the traditional university. Everywhere, the participants come not only from different countries but also from different cultural backgrounds. Moreover, account must be taken of the great differences in preparatory schooling. Instruction is in most cases problem-oriented, that is to say less attention is given to transfer of ready-made knowledge (belonging to one of the scientific disciplines), but more to the common search for solutions following multi-disciplinary methods. The didactics and methodology maintained during schooling is adapted to the specific needs of this education. Thus, a more individual approach is made in the light of the differences in preparatory schooling and cultural background of the participants. Because a majority of the participants have a measure of experience, the knowledge and insights they each contribute and exchange amongst themselves form an important element in the teaching method. When selecting the participants, attention is paid not only to academic qualifications, but also to practical experience, future plans and command of the English language.

The recruitment of students at a distance, and the application of criteria completely different from those which apply to the national universities, poses special problems; these exhibit a large measure of similarity over the various institutes.

The international education is characterised by a powerful dynamic and flexibility. In order to continue to be effective the study programmes must undergo continuous adjustment to the changing needs of the developing countries. The staffs of the institutes must keep abreast of these needs through personal observation and continuous investigation. This demands co-operative links with organisations in the developing countries and also requires the readiness where necessary to transfer emphasis on activities here to activities in the Third World.

Carrying new skills back home

Finally, as a characteristic common to all the institutes for international education the fact should be emphasized that they are not guilty of advancing the braindrain. In many publications the braindrain is cited as a disadvantage inseparable from study abroad. This may well apply to younger students who have gone abroad to follow a complete university curriculum. They are sometimes alienated from their homelands and merge more or less fully with life and work in the land where they go to study. But in practice this is found not to apply to the system of shorter courses at postgraduate level (1 year approx.), where the participants are somewhat older than the average student and have more stable links with their home countries.

A survey of all the international courses currently organized in the Netherlands can be obtained from the Netherlands Universities Foundation for International Co-operation (N.U.F.F.I.C.), 27, Molenstraat, The Hague. ■

E. JONGENS

Gum arabic

(from page 80)

Potential production in Chad. Estimates put the area suitable for the gum tree in Chad as high as 3.5 m ha. If only 10% of this area were brought into production with a yield of 200 kg per ha per annum, it would double the present world output. The initial Chad target is an annual production of 2 000 tons, which calls for 10 000 ha of improved gum trees.

Current prices range between F-CFA 300 and F-CFA 800 per kg f.o.b. N'Djaména airport. The production of gum arabic is the only Sahel export crop which pays its way. For the Chad farmer it could be at least as profitable as the cotton growing in the southern part of the country.

Uses of gum arabic. Gum arabic differs from other natural hydrocolloids by its high solubility in water. It has the advantage of being inoffensive, without any smell or taste; and it makes no change in the colour, taste or smell of other matter with which it comes into contact.

Its chief use is in food as an agent affecting the viscosity, consistency and texture of the product. Other uses are:

a) **Food:** Gums, licorice sweets, soft drinks, aromatic products, bakery, deep-freeze and brewery products.

b) **Pharmacy:** Making of pills, tablets and pastilles and as an excipient for medicines presented in suspension or emulsion.

c) **Adhesives:** For stamps and envelopes.

d) **Printing.**

e) **The paint industry.**

f) **Textiles:** Dressing and finishing processes.

g) **Cosmetics and toilet goods.** ■

Dr. ROCK
Forestry Engineer
F. GARRET
E.D.F. Technical Adviser

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BOOKS

Jean CHAUMELY. — **A manual of printing for children and managing directors (L'imprimerie enseignée aux enfants et aux présidents Directeurs généraux)** — Editions Conseils, Paris, 1974.

We have had many letters from readers in recent months asking whether we knew of any book dealing with the things that should be known about printing, and setting them out in simple terms which can be understood by everybody. This type of book, it seems, is extremely difficult to find in Africa. No commendation, therefore, can be too high for this recent little book of 64 pages, addressed to anybody who wants to know everything, or nearly everything, about the printed word, about lettering and pictures, composition, reproduction, page make-up, printing processes, ink, paper, binding and many other such things. In the preface to the work the author remarks, with a certain sly humour: "You may ask why the same book should be written alike for children and managing directors. The reason is that it is useless to give different answers to the same questions which spring from the same ignorance. Even when children have reached a certain age, they may still desire a certain simplicity in their new knowledge; and when they are managing directors, they have just as little time to spare as when they were children".

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Christian CASTERAN. — **The Third World (Le Tiers monde)** — Collection "Tout savoir sur" — Edition Filipacchi, 1973.

The author of this concise and very readable little book works in the international political department of the french newspaper "La Croix", and specialises largely in political developments in the countries of the Third World.

One cannot speak of the Third World without thinking of underdevelopment. Here are 2 400 million people, or three quarters of the human race, who are under-fed. The simple fact brings up a great many questions—is underdevelopment inevitable? Do geography, history and population trends provide adequate explanations for the realities of the Third World? Moreover, the gap between the developed countries and the developing countries is still growing wider, and the last two decades have shown that the aid given by the former to the latter has been insufficient and often ill-adapted to its purpose. Are we headed for growing conflicts, or for the definition of a new international order, which will be more just and more effective?

The book does not seek to put forward a thesis, but it sets out concrete considerations for the replies to these questions. It attempts only to demonstrate realities and show the course which has been taken by the relationships between the Third World and the industrial countries.

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Guy-André SMAL and Joseph MBUYI. — **Femme africaine, réveille-toi! (African womanhood awake!)** — Preface by Madame Irène Petry — La pensée universelle, Paris 1973.

One of the authors of this book is a Belgian, one of the pioneers in the re-education of handicapped persons. In Zaïre he provided care for many thousands of people, handicapped and others. The other author is a citizen of Zaïre, and was once a pupil-teacher in a mission school.

The book begins with two prefaces. One is by Madame Irène Petry, former Belgian Secretary of State for Development Cooperation. "All over the world", she says, "mankind has to struggle towards freedom. This has included the fight for social equality, the fight for knowledge, the fight for human dignity. Tribal laws and customs and all the traditions, cast into the melting pot as they were by the colonial system, are a heavy burden on a society in search of its own identity and in which the role of womankind has yet to be defined".

The other preface is by the Cardinal Archbishop of Kinshasa. "At the present time", he comments, "both the civil power and the church are seeking to intensify the struggle for woman's liberation; for they are convinced that the promotion of women is a necessary factor for securing the balance and harmony of the nations' homes".

NOTE TO "BOOKS"

Many readers have asked us to send them the books reviewed on this page. We regret that this is a task we cannot undertake. The books can be obtained at or through the nearest bookshop.

Centre d'Etudes et de Documentation pour l'Afrique et l'Outre-Mer. — "Fichier" (card index) and "l'Afrique à travers les publications de la Documentation française" (Africa as seen in publications of La Documentation française) Paris 1974.

Since 1960, la Documentation française has been publishing a card index of the legislation and regulations of general interest in a large number of african countries, from references to them in the official gazettes of the african countries concerned. The countries are: Cameroon, the Central African Republic, Congo-Brazzaville, Ivory Coast, Dahomey, Gabon, Guinea, Upper Volta, Madagascar, Mauritania, Niger, Senegal, Chad and Togo.

This card index is drawn up by Documentation française through the Centre d'Etudes et de Documentation pour l'Afrique et l'Outre-mer. It also includes all the legislative texts relating to french overseas departments and territories.

This makes available 32 000 card-slips, covering the period 1960-72. Of these, 28 000 relate to the african countries and Madagascar and 400 to the overseas departments and territories. They are classified alphabetically under the separate headings and constitute a unique and indispensable working tool for everybody with an african interest, whether he be an economist, head of a firm, member of a university, a civil servant or a diplomat.

La Documentation française also provides its readers with a work entitled "L'Afrique à travers les publications de la Documentation française". This consists of a list of titles (articles, documents and surveys) which it has published over the 1961-72 period. They are classified by regional groupings and general information on Africa; and under the different headings there is much information on the political and economic life of Africa.

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Amadou Mahtar M'BOW (Senegal) to be UNESCO Director-General

The appointment in 1974 of Mr. Amadou Mahtar M'Bow to be Director-General of UNESCO is a political event of major importance for Africa. UNESCO is the Organisation of the United Nations for Education, Science and Culture, with a brief which makes it one of the most important international organisations. This is the first time an African has been appointed to the executive presidency of any of the big U.N.O. organisations.

The new Director-General comes from Senegal. He was born in Dakar, and most of his childhood was spent at Louga. In 1940 he volunteered for service in the French army and reached France in the same year. After the armistice he returned to Senegal, but was brought back under the colours shortly afterwards, and took part in the North African campaign.

In 1946, Mr. M'Bow started on a course of higher education, and proceeded to a degree in literature at the Sorbonne (1951). He has played an active part in many students' associations, including the presidency and general secretaryship of the FEANF (Fédération des Etudiants de l'Afrique Noire en France).

The political career of Mr. M'Bow began in 1957. He was appointed Minister for Education and Culture in the first Senegalese government (1957-58), but later he left the ministry and entered the educational field as a teacher in the Ecole Normale Supérieure at Dakar, where he remained till 1964. Combined with these duties, he was carrying on a political campaign inside the Parti du regroupement africain. He returned to the government as Minister for National Education (1966-68) and subsequently Minister for Culture and Youth (1968-70), still maintaining his political activities in the Senegalese National Assembly, the Municipal Council of St. Louis and elsewhere.

His first contacts with UNESCO came in 1966, when he was head of the Senegalese delegation to the 14th and 15th sessions of the General Assembly. He became Chairman of the UNESCO sub-committee on education and programming, and four years later was appointed Deputy Director-General in charge of education (1970).

During this period his work of political significance included his contribution towards the establishment of permanent links between UNESCO and the O.A.U. (Organisation for African Unity), and his successful advocacy of substantial UNESCO subsidies being granted to liberation movements in African countries still under foreign rule.

In a great number of articles and studies for which Mr. M'Bow was responsible, he also prepared the ground for new forms of education in Africa, which would allow more fully for the personality and social-economic background of the pupils. This was a matter, he said in an interview with Association News (No. 25), of "adapting education to the state of economic and social development, but making due allowance for cultural peculiarities". Mr. Mahtar M'Bow is thus faced with an ambitious task which he is taking over from M. René Maheu, whose qualities have been particularly widely appreciated.

Mr. M'Bow becomes head of UNESCO at a difficult time in the history of this organisation. It may be that this will prove a strong point for him in tackling the no less difficult task of education in general, which is a basic condition for progress in the widest sense. In taking up his new job as Director-General of UNESCO he takes with him the best wishes of Association News for the successful fulfilment of his task. ■

Rome: The World Food Conference

Ministerial level representatives of 123 countries met under United Nations auspices at the World Food Conference in Rome from November 5–16, 1974, in the shadow of a world shortfall of 10 million tons of grain.

There have been world food conferences before, in 1963 and 1970, but the Rome conference, the first in intergovernmental form, specifically put the emphasis on political action. It derived from a suggestion at the Algiers Non-aligned Nations Conference in Septem-

(read on page II)

Europe—A.C.P. Negotiations

The negotiations between the European Community and the A.C.P. countries (Africa, Caribbean, Pacific) at the ambassadorial and plenipotentiary level were completed on December 9, 1974.

Mr. Hans-Broder Krohn, Director General for cooperation and development at the Commission of the European Communities, told a press conference on December 13 that an initial draft of the complete text of the agreement was drawn up on the conclusion of the talks. It covered all the main sections of the new Convention, i.e. the stabilisation of export receipts, industrial and financial cooperation, trade and the institutions.

Several difficulties, however, still remained, said Mr. Krohn. These included the "character" of the new Convention; the question of "free and unlimited access" to the European market for certain competitive A.C.P. products (meat from Botswana, citrus fruit from Jamaica, etc.); rules of origin; and the question of whether or not European grants transferred to the A.C.P. under the stabilisation scheme will be repayable.

The Director General for development and cooperation nonetheless took an optimistic line in saying that he did not consider these difficulties insurmountable. He considered that they should be solved after the A.C.P. ministers' meeting at Dakar on December 17, 1974, and the A.C.P. and E.E.C. ministers' meeting provisionally due for the middle of January, 1975. The new Convention should be signed after the latter meeting and before January 31, Mr. Krohn said. This would help with putting transitional measures into effect before the ratification of the agreement by the signatory countries.

The Council of Ministers of the Nine has also given its consent in principle to the eventual inclusion of Guinea Madina do Boe (Bissau) in the Convention, if this country makes the request.

STOP PRESS

Guinea Madina do Boe (Bissau) has given official notification of its decision to join the A.C.P. group negotiating with the European Community, M. Claude Cheysson, member of the Commission of the European Communities, told a Brussels press conference on December 16, 1974. M. Cheysson said Guinea would take part in the A.C.P. ministers' conference at Dakar from December 17 and would be represented at the next Europe-A.C.P. meeting before the signature of the new agreement, in which the young republic would play a full part.

M. Cheysson made the announcement on his return from Bissau after the first visit by a European politician to the new State. He expressed his satisfaction that Portuguese-speaking Guinea would become the 46th A.C.P. State, together with his personal feeling and admiration for the people and authorities of this "little" country which had a role to play because of its "exceptional courage". ■

ber 1973, and took concrete form after a United States initiative in the same month. A pre-conference forum of independent experts described the food situation as the most serious crisis since the Second World War, threatening 500 million people with death by the year 2000.

Observers did not generally suppose that so many politicians could arrive then and there at real joint international action, especially in view of the bloc position maintained by the Algiers conference countries. The United Nations method is to invite collective engagements and follow them up separately in practice, and a working group began to hammer out the reality of the declarations after the conference.

Yet the pessimists were wrong. A string of resolutions adopted on the last day included several important initiatives. The main resolutions adopted were:

The creation of an **international agricultural development investment fund,** proposed by the oil-producing States and supported by a number of industrial countries despite the negative attitudes of the U.S., Japan, West-Germany and France. An initial estimate of the fund's size was $1 000 million. Contributions would be voluntary.

Increasing food aid by stepping up the current 6-7 million tons of cereals a year to 10 million tons in 1975. The main suppliers, notably the U.S. and the E.E.C., gave the impression that this would be difficult for them alone.

Establishing a **world emergency cereal stock** of up to 60 million tons of grain. The U.S. and the E.E.C. were divided as to how this should be done.

Creating a **World Food Council,** mainly charged with carrying out the 14 resolutions finally adopted by the conference. This body would be nominated by the U.N. Economic and Social Committee rather than by the General Assembly, but would be answerable to both. The Food and Africulture Organisation (F.A.O.) would provide its secretariat.

Other resolutions called for the creation of an international famine alert system, including the use of observation satellites; the exchange of information on harvests and stocks, which is still considered strategic information by some nations; better use of pesticides and fertilisers; renewed attack on animal diseases; agricultural research; an ecological charter; and work on the rôle of women in food production. A Peruvian resolution to cut arms spending by 10% to allow increased agricultural aid was adopted with difficulty and described as "totally unrealistic" by China.

An overall resolution was adopted giving more political backing to U.N. organisations dealing with international trade, and calling on the U.N. Conference on Trade and Development (UNCTAD) and the F.A.O. to increase their efforts. The conference adopted a final declaration on the eradication of hunger and malnutrition in the world.

The question of the oil producers' obligations to the hungry countries and their relations with industrial countries naturally underlay the conference, and U.S. State Secretary Henry Kissinger's initial proposal to launch a World Food Fund was not retained, no doubt because of its blunt implications to the oil States. Yet despite these undertones, optimists can see the beginnings of a world-wide social security system in the conference. ■

European Development Fund

Following the assent given by the E.D.F. Committee at its 93rd meeting, the Commission has made three further financing decisions, amounting to a total of U.A. 3 891 m, consisting of non-repayable aid from the 3rd E.D.F.

1. **Ivory Coast:** Contribution to reorganisation of regional technical centres at Ferkessedougou and Katiola: F-CFA 100 m, or about U.A. 360 000.

The Community aid will include acceptance of responsibility for three years of the cost of employing one expert, and finance for part of the infrastructure and equipment of the two centres.

2. **Ivory Coast:** The Maraoué Ranch: F-CFA 925 m, or about U.A. 3.33 m.

This is an E.D.F. contribution to financing a ranch on the river Maraoué, in the north-central region, for breeding beef cattle from the N'dama strain. Within about 15 years after the starting of the project, the ranch should have a herd of 20 000 head and cover an area of 82 000 ha.

3. **Association News:** Appropriation for 1975: U.A. 200 000.

This is for the continued publication of Association News, which appears every two months in French and English and now has a circulation of 27 000 copies. It is still a valuable link between the E.D.F. and its former trainees and bursary holders; and it also provides full information on various aspects of the Association for readers in Associated countries and the associable countries of the Commonwealth.

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Following the assent given by the E.D.F. Committee at its 94th meeting, the Commission has made five further financing decisions from the resources of the 2nd and 3rd E.D.F. amounting to a total of U.A. 5.351 m. The projects concerned will receive non-repayable aid in the form of new commitments from the 3rd E.D.F. amounting to U.A. 2.986 m; and an additional U.A. 2.365 m through the adjustment of earlier credits from the 2nd and 3rd E.D.F.

1. **Islamic Republic of Mauritania** — *Formation of a rural engineering brigade for dam construction in the Hodhs region:* 108 m Ouguiyas, or about U.A. 2.031 m.

This project is concerned with the formation of a rural engineering brigade with mobile equipment, to carry out a programme of repair and construction on 18 subsided dams in the eastern and western Hodhs regions, and to undertake their subsequent maintenance. Its purpose is to increase food production and improve living conditions for the population in up-country regions.

2. **United Republic of Cameroon** — *Improvement survey for the Yaoundé-Bafoussam road:* F-CFA 220 m, or about U.A. 792 000.

This finance is for the carrying out of complete surveys for improvements and surfacing of the Yaoundé-Bafoussam road over a distance of 330 km. The effect of the improvements will be better communications in the western and south-central regions and better food supplies to the capital.

3. **Republic of Zaïre** — *Survey for road between Goma and Rwindi Camp:* 204 000 Zaïres, or about U.A. 355 000.

This is for carrying out surveys covering the surfacing of the 130 km road linking Goma in North Kivu with the Rwindi Camp, which is a tourist centre in the Virunga National Park. Its purpose is to facilitate a quick and permanent link with this important tourist centre, and promote marketing arrangements for the agricultural and industrial potential of the region.

4. **Central African Republic**—*Slaughter-house at Bangui (additional finance):* F-CFA 435 m, or about U.A. 1.567 m from the 2nd E.D.F., and F-CFA 152 m, or about U.A. 547 000 from the 3rd E.D.F.

The Bangui slaughter-house project was awarded Community finance in 1968, but an additional credit of U.A. 2.114 million is indispensable for its completion. The additional funds are needed partly because of technical adaptations arising through a new evaluation of the requirements, and partly because of the rise in prices since the original financing.

5. Provision for discussion conferences (period Feb. 1 to Dec. 31 1975) — U.A. 59 000.

This is to finance 14 discussion conferences to be held in Europe in 1975, and various information meetings in African universities and training institutes. As hitherto, these conferences are intended for the nationals of Associated countries, including the associable countries in Africa, the Caribbean and the Pacific. Their purpose is to give bursary holders general information about the existing relations between the European Community and the A.A.S.M., and about the prospects resulting from the enlargement of the new Association Convention.

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Following the finance decisions now made, **the total commitments from the 3rd E.D.F. amount to U.A. 783 139 000, covering 288 decisions** since the Fund began operations on January 1, 1971. ■

The Dakar Club

A new club has come into existence. This is the Dakar Club, formed in the capital of Senegal on December 1 and 2, 1974 by leading personalities in Africa and Europe, with the participation of the advisors to the President of the World Bank (U.S.A.) and the O.E.C.D. Development Centre (France).

The Dakar Club is to the Third World the equivalent to and the complement of the Rome Club. According to Mr. Mohamed Diawara, Planning Minister in the Ivory Coast and one of the many founder members of this new international body, the Dakar Club will aim at "joint consideration, conception and proposal" of solutions to development problems in non-industrial countries. In this way it is intended that interests and attitudes shall be "concerted rather than confronted". To this end, stated Léopold Sédar Senghor, the President of Senegal, the Dakar Club should become a centre for work and for forward looking approaches, designed to attain "a global development strategy" based on "inter-regional unions", one of which is Eurafrica.

The Dakar Club is an important new departure. Further particulars will be given in our next issue. ■

The European Parliament

At the end of November 1974 the Standing Committee on Development and Cooperation organised an exchange of views in preparation for the report to be put forward by Melle Colette Flesch (lib-Lux.) on the enlargement of the Association.

Among those taking part was Mr. Maurice Foley, a Director-General in the E.E.C. Commission, who gave an account of the current state of the negotiations between the Community and the A.C.P. countries.

The document to which Melle Flesch is now putting the finishing touches, will certainly be a landmark in the history of the last 15 year's relations between Europe and the A.A.S.M. It will of course describe the current state of the negotiations. It will put special stress on the attitudes laid down jointly in recent Eurafrican parliamentary meetings, especially those at Dinard and Mauritius. There are two points to which special prominence will be given. One is the affirmation that the Association is to continue indefinitely, with the periodic reexamination concerned only with the technical details. The other is the assertion that the Association parliamentary Conference as it now exists must be further extended.

According to Melle Flesch, the enlargement of the "Club" calls for adaptations in the design, composition and procedure of the parliamentary Conference, which should thus be able to play an even more effective part in activating and supervising the partnership which is now being set up.

In putting forward these attitudes in the European Parliament, Melle Flesch will have the more influence through her election by unanimous vote as Chairman of this committee. Her predecessor, Mr. Achenbach, recently resigned owing to the multiplicity of his duties. ■

Food aid in cereals

Programme for 1974-75

On November 27 the Commission drew up a note to the Council on the 1974-75 food aid programme in cereals. In view of the urgency of requirements the Commission considers the whole programme should be approved as quickly as possible, and in any case before the end of 1974.

Proposals will be put to the Council in the early future regarding the food aid to be given in powdered milk and butter-oil.

Tendencies

The Community food aid programme for 1975 must rank as the first concrete example of the new tendencies in development aid recently put forward by the Commission. For this reason it is proposed that the food aid be concentrated much more than hitherto on the most necessitous countries. Accordingly, 81 % of the aid proposed for the applicant countries is provided for the Sahel countries and the Indian sub-continent (compared with 72 % under the final programme for 1974).

Even this concentration, however, does not enable the Community to cover the full requirements of these countries, nor to give satisfactory effect to the considerations emerging from the World Food Conference.

The proposals now put forward are in fact based on the draft budget, as adopted by the Council in its first reading, providing for the volume of the aid to be maintained at the level of existing commitments under the food aid Convention, which provides for a total of 1 287 000 tons, of which half (643 500 tons) is to be applied to Community action proper.

Compared with requirements shown in reports to the World Food Conference, this figure is seen to be far from sufficient. The Commission formally calls the attention of member States to this fact, in order that the Council may reconsider the attitude adopted in relation to the budget, and reconstitute the credits asked for by the Commission so that the direct aid by the Community should be raised to 1 million tons.

Applications received

A total of 37 applications were made direct to the Community (34 countries and three international organisations— W.F.P., UNICEF, and UNWRA). They

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Measures to fight drought in the Sahel and Ethiopia

In view of the disastrous drought conditions in the six Associated countries in the Sahel and in Ethiopia, the European Community made available in 1973 and 1974 two additional groups of resources, amounting together to a total of $169 200 000. These consisted of:

1. **Food aid:**
— 248 000 tons of cereals;
— 27 000 tons of powdered milk;
— 6 000 tons of butter-oil;
the total amount of which was $104 400 000.

2. **Finance aid for:**
— health campaigns and supply of agricultural by-products, especially cottonseed for cattle;
— supply of seed;
— sinking of emergency wells and drillings;
— repair of roads and tracks;
— additional transport material.
Including various smaller items the total was $64 800 000.

EMERGENCY EEC AID TO SAHEL COUNTRIES AND ETHIOPIA IN 1973 and 1974

	Mauritania	Senegal	Mali	Upper Volta	Niger	Chad	Ethiopia	Total
Amount in 1973								
Food aid (tons)								
— cereals	5 000	23 600	37 000	19 900	14 500	13 000	5 000	118 000
— powdered milk	1 800	2 400	2 100	1 800	2 500	2 400	—	13 000
Food aid—Value 1000 U.A.	1 811	4 942	7 190	4 859	4 487	3 549	1 000	27 838
Finance aid (E.D.F.) under Yaoundé Convention art. 20.	2 629	2 114	7 126	1 116	2 809	3 216	—	19 010
Decisions for 1974								
Food aid (tons)								
— cereals	10 000	15 000	29 000	15 000	20 000	10 000	20 000	110 000
— Sahel reserve								20 000
— powdered milk	2 000	—	2 900	2 600	3 200	800	2 500	14 000
— butter-oil	1 000	—	300	1 800	1 450	110	1 300	6 000
Food aid (value 1000 U.A.)								
food	5 400	2 600	7 900	8 300	11 100	3 900	9 000	54 000 (1)
transport								5 000
Emergency finance aid from Commission budget	4 800	3 300	7 400	4 300	7 700	5 100	2 400	35 000
Surplus from 1973 budget							600	600
Total 1974 (value)								94 000

(1) Including reserve of U.A. 5 800 000 for the 20 000 tons of cereals for Sahel not yet allocated. 1 U.A. (unit of account) = $1.20.

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amount to a total of 2 371 000 tons of cereals; and since the figures are still lacking in some of the applications this total must be regarded as a minimum. It represents an increase of 20 % over the quantities applied for last year.

As hitherto, the proposed programme draws a distinction between the applications for "normal" aid and those for emergency aid.

Applications for normal aid

The quantities delivered against applications for normal aid will be sold in the local market and the counterpart funds applied to financing development projects.

The applications put forward under this heading have been examined and assessed in the light of:

— the criterion of food deficit;
— the criterion of income per head; and
— the criterion of balance of payments deficit.

Applications for emergency aid

Aid given under this heading is intended for free distribution to cover the requirements of certain categories of population resulting from conflicts or natural disasters.

Examination of the applications under both heads led to the conclusion that 26 countries are eligible for Community aid in 1975 (compared with 31 in 1974). In addition, the Commission proposes to increase the allocations to the World Food Programme (W.F.P.) and maintain those to UNICEF and to UNWRA (aid to Palestinian refugees). In regard to the latter, however, a final decision can only be made if and when the countries concerned in the Middle East let it be known that they are interested in UNWRA continuing its activities and desire the Community to make its contribution.

There is also provision for a reserve of 55 000 tons to deal with possible emergencies arising in 1975.

— Earlier proposals for action in advance

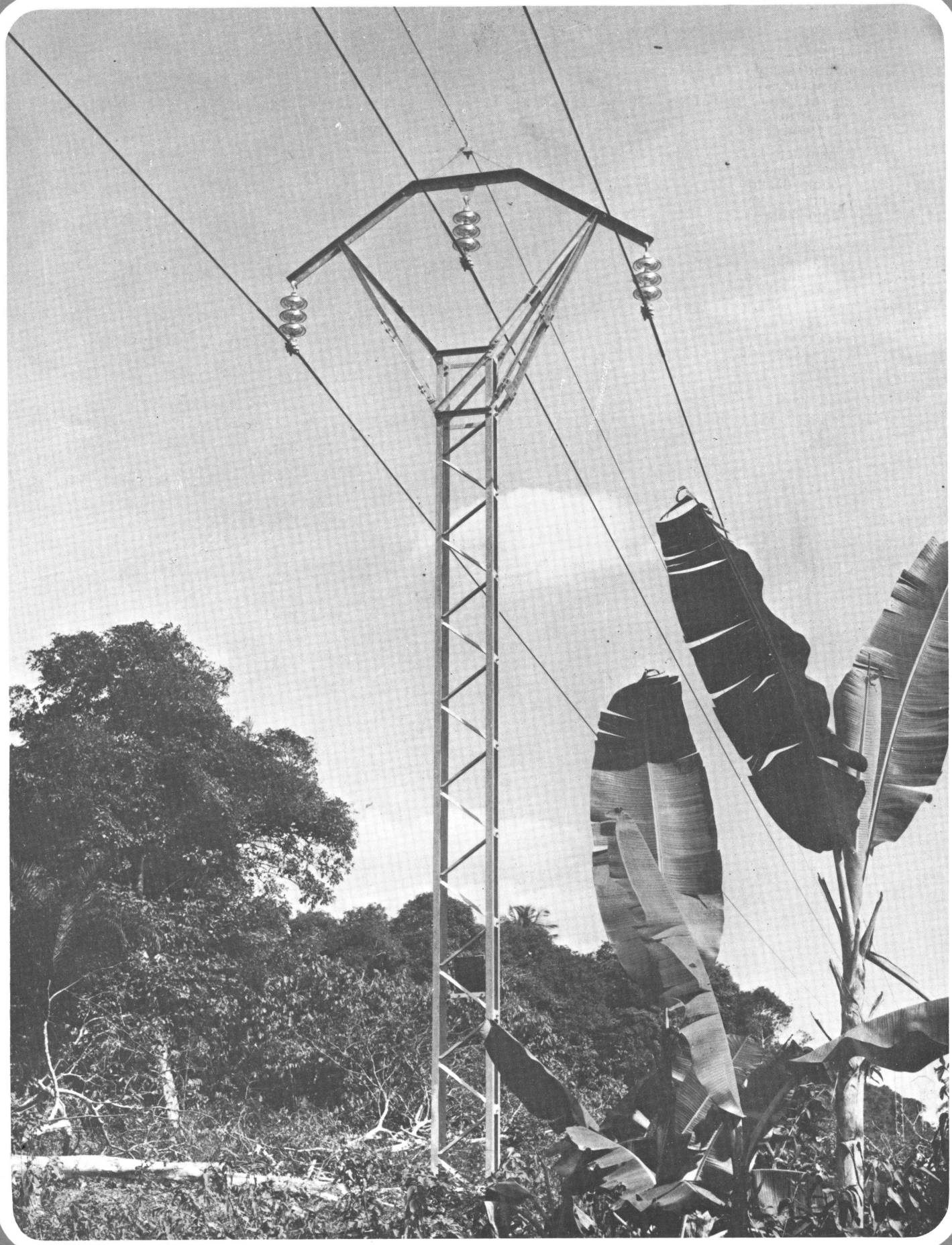
Two decisions have already been made by the Council in anticipation of the 1975 programme:

For the Sahel countries:

On October 21 the Commission put forward for early decision by the Council an interim programme providing for the allocation in advance of 43 000 tons, and the allocation of the 17 000 tons of cereals still available in the reserve under the 1974 programme. Since the supply proposed under the 1975 programme was ultimately 70 000 tons, the total becomes 87 000 tons to be supplied, subject to subsequent adjustments, by the Community in 1975.

For India:

From the supply of 300 000 tons proposed by the Commission, the Council has already decided (November 28) that 150 000 tons be allocated by way of direct aid from the Community. ■



High tension (33 000 volts) transmission lines serving the region around Lagos (Nigeria)

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