13746

tool

congress

socially appropriate technology

C O N T E N T S

NOTES ON THE SPEAKERS

Sri A.T. Ariyaratne is the organising secretary of the Sarvodaya
Shramadana Movement in Sri Lanka.   There is close contact between
the Movement and TOOL Foundation, through the Sarvodaya Appropriate
Technology Programme, which includes windmill and workshop aspects.

Mr B.P.Mramba is the Director of the Small Industries Development
Organisation in Tanzania, a para-statal agency with which the TOOL
Foundation is developing a series of cooperative links.

Dr E.F.Schumacher is most widely known as the author of "Small is
Beautiful".   He is responsible for the creation of the Intermediate
Technology Development Group, the British voluntary agency, and has
worked with colleagues most patiently to promote the establishment
of appropriate or intermediate technology centres throughout Africa,
Asia and Latin America, in addition to encouraging sister organisations
such as the TOOL Foundation.

Dr E.van Spiegel is the Director-General of Science Policy within
the Ministry of Education and Science of the Netherlands.

Drs J Pronk is the Minister for Development Cooperation within the
Ministry of Foreign Affairs of the Netherlands.   The Minister spoke
at the end of the second day of the Congress.

Panel discussion was held at the end of the first day of the Congress
after the speeches of the above first four guests.   Additional
panel participants were Lord Oram, a Director of the Intermediate
Technology Development Group, and former Minister in the Ministry of
Overseas Development of the United Kingdom, and A. de Wilde, then
Chairman of the TOOL Foundation.   Mr de Wilde also delivered a
valuable speech on the role of the Foundation in promoting socially
appropriate technology within educational institutions and in part-
icipating in the execution of development projects.   Regrettably,
for technical reasons, it has not been possible to transcribe this
speech, and profound apologies are due to Mr de Wilde and those who
wished to have a record.

Any opinions expressed in this publication are those of the
speakers, and the TOOL Foundation cannot accept any formal
responsibility for them.

Introduction

Objectives of the TOOL-congress

After a period of building up the organisation of the TOOL Foundation, which was a period of hard work, it seemed necessary to the board of the TOOL Foundation to organize a congress. It would be the first possibility, within the framework of the TOOL Foundation to look back and, consequently, to look forward. Apart from such general slogans as co-ordination and servicing, not much was said about a policy for the TOOL Foundation for the coming years. In practice, however, many problems arose which asked for a solution and all the questions asked for a policy. Such a policy was especially necessary because of turbulent development in the field of operation, resulting in an increase of views on this field. An essential discussion on general assumptions and methods was necessary. A secondary objective of the congress was to give the member groups of the TOOL Foundation the chance to meet each other and to exchange experiences. Until that time most of the relations between the member groups existed between the boards of these groups. The board of the TOOL Foundation wanted to strenghten the possibility of the organisation by having this formal and informal exchange of ideas.

A congress for whom?

According to the objectives, the main target-group of the congress were the members of the TOOL member-groups. But in connection with the general discussion it was important that all people interested in our working on socially appropriate technology should contribute. In this respect we can mention organisations like the volunteers-organisation, missionary organisations, and universities, research institutes, representatives from technical educational institutions, and, last but not least, the policy-makers from the Ministry of Foreign Affairs, which includes the Minister for Development Cooperation, and the Ministry of Education. Visitors not affiliated to TOOL were allowed to attend and take full part in the discussions of the <u>first</u> day. During this day some speeches were given about the need for socially appropriate technology in the research and educational institutions and finally an assesment of what had already happened in the recent past in the Netherlands. It was thought to be very useful to have contributions from developing countries as well as from the policy-makers.

The <u>second</u> day conclusions were to be drawn, both from the theoretical discussions of the day before and from the experiences of those involved in the actual work of the TOOL Foundation.Apart from some selected guests, amongst whom were our Minister for Development Cooperation and a representative of our "sister", ITDG, in England, Lord (Bert) Oram, and development field workers for answering questions, this day was attended by members of the TOOL member-groups only. Especially because a frame work for the policy for the next two years should be "drafted" it was necessary to keep the contributors to this draft as close to the actual work as possible.

1

A note should be made on the discussion method. It was not aimed at the acceptance of resolutions or anything like that.

Much more important was to have an intensive contribution to the discussion by those who attended the congress, and that these people should not be hindered from expressing their views on the future by a ready-made plan of the board. This sounds nice but the problems to be conquered were the heterogenity of thoughts and all kinds of linguistic problems. Good preparations were necessary, expecially within the TOOL member-groups. Maybe it was because all this failed up to some extent that the results were not what they could have been. Still a tremendous effort has been made by having 150 people discuss very essential topics and drawing important conclusions from these discussions. A full report of this second day is available in the TOOL-office (in Dutch).

The results and the follow-up

The second day resulted in about twenty conclusions, which can be seen as starting points for a TOOL-policy. A group has been formed to interpret these conclusions in such a way that a framework for a strategy and a programme (the policy) can be made. Some problems have since arisen due to some organisational conditions and also due to the necessity for negotiating the TOOL budget for next year. At the moment a group is working hard on drawing up a final proposal for the TOOL policy, which will be discussed in detail by all the cooperating groups of TOOL.

Why this report of the proceedings?

At this point I have to mention the great diversity of newspaper reports on what was said during the congress. From this the need arose for an assesment of "what was really said during the congress".
It is mainly for this reason that we present in these proceedings the texts of the congress-speeches. With the exception of minor editorial changes committed for style, the texts are literal. Because of the originality of the contributions we think the reading of these proceedings very worthwhile.

Eindhoven,
Frans Steffens

Welcomes and opening

Welcome address by Prof Dr. J.F. Crul on behalf of the Executive Board of the University of Nijmegen

Mr. Chairman of the organizing committee, Mr. Chairman of the congress, dear guest speakers from far away and nearby, ladies and gentlemen.

A lot of cases of modern technology have widened the gap between the rich and the poor countries of the world. Instead of being an instrument of cooperation, it is felt by many poor countries to be a tool used by the advanced countries to maintain their supremacy. Technological progress is looked upon by these countries as the main source of freedom and independence. However, in the countries where such a technological process was started, it turned out not to be the answer to all their needs. What was good for the industrialised countries not always fitted in the development scene of the agricultural nations. Adaptation therefore is urgently needed and the Netherlands institutes of higher education currently took up that issue and started to work on such appropriate tools.

The situation of working groups active in the field of appropriate technology has gained an enormous enthusiasm and is spreading over the continents where it is most needed.

The University of Nijmegen feels proud to be the host of the first congress organized by this society and extends a warm welcome to all the participants of this meeting.

An overwhelming number of scientists and students carry a promise for the future growth of this idea. We hope that not only the Dutch workers in the field of development will benefit from this society, but that soon appropriate technology will also come in an increasing amount from the native leaders themselves.

This will close again the gap that inappropriate technology has created and bring us together to the common goal of wellbeing for all the people of the world. The University of Nijmegen wishes the organizing committee and the participants a very fruitful and successful congress. Thank you.

The opening of the congress by A. de Wilde, Chairman of the TOOL-foundation

Ladies and gentlemen, on behalf of the board of TOOL, I would like to welcome you to this congress. I especially want to thank Prof. Crul not only for his kind and courteous welcome, but, even more for his

hospitality and all the efforts made by the people of the university to make this congress possible. I'd especially like to welcome our guests from abroad, Mr. Mramba and Mr. Ariayaratne and Mr. Schumacher. Furthermore I have to say that on one hand we are pleased with the publicity and this large audience, and on the other hand you will understand that we feel sorry that we had to say "no" to the large number of people that could not attend this conference because we had no more space. Furthermore I would like to introduce to you the chairman of this first TOOL congress-day, Mr. van Bronckhorst. I want to thank him for the time he spent on the preparations. Mr. van Bronckhorst, please take the chair. I hope it will be a pleasant and fruitful day for all of you.

Elucidation of the theme by Ir. B. van Bronckhorst

Thank you very much, Mr. Chairman, that you gave me the opportunity to start as chairman of such a large meeting.

Appropriate Technology is not new. In fact, it has been talked about, but more importantly, it has been worked at for quite some years.

It is known under different names, like intermediate technology, the name which is used by Mr. Schumacher - adaptive technology - progressive technology - some people talk about selective technology and also of village technology and apart from these words, there are many other connotations on the aspects of appropriate technology, because we want to keep to that word, the aspects of appropriate technology as it is stressed by a particular author.

We have chosen appropriate technology and I want to explain this concept a little further. Technology in fact is a twofold concept. On one hand it is a systematic study of materials and equipment for carrying out operations or making a product. On the other hand, it is a specification of knowledge for a solution of practical problems.

Thus, it is an activity as a body of skills and material things. It is a method and a catalogue. Technology is always connected with practice and useful things. When we come to the word appropriate, it means that we put a certain demand on technology because not everything will be considered nor will every solution be acceptable. We want to stress that we are after socially appropriate technology, which indicates that the norms and values to which we refer in judging technology are found in society.

Technology is a tool, a basic tool in the lives and for the well-being of people. We are here to concentrate on socially appropriate technology in order to prepare ourselves to work: to work at the real problems of this world, this developing world in which we all are faced with so many questions of adaptation, to command this process of change. Speakers of today will go into the matter more specifically and they will do that from their personal and very intense experience . I am certain that you will not only be inspired by their words, but that what they say to you what they bring to you, will provide a basis for you to build your workplan, because as I said before and I will repeat it now, socially appropriate technology is not just for talking about. It is for doing and the reason that we are all here, I believe, is to prepare for that doing.

Sarvodaya Shramadana

A T Ariyaratne

It is with a sense of oneness with all of you present here that I
participate in the deliberations of this congress. Sarvodaya Shramadana
Movement of Sri Lanka which I represent here is closely associated with
TOOL in its thinking about development strategies and several grass-
roots practical projects which are jointly carried out for the benefit
of the poor in my country. In the development of the Sarvodaya Shramadana
Movement, the governmental and non-governmental organisations and people
of Netherlands have been most helpful to us. Above all the enlightened
and progressive economic cooperation policies followed by the Government
of the Netherlands in their relationships with the poor world is a source
of strenghts to all of us who are trying to build up our societies based
on the principles of self-respect, self-help and self-reliance. All these
factors make me feel one with youwho are assembled here in the University
of Nijmegen.

Western technology: imitation or irritation?

Science and technology is such a vast and complex subject that laymen
like myself should not attempt to make simple generalisations on its
application to human situations. However, I believe that like any other
tool in the hans of the human being, science and technology also should
be subject to the morality of human behaviour and control. When science
and technology become amoral and take over the control of man in the
same way as it does with any other thoughtless and senseless material
objects then it has gone beyond its usefulness and needs re-direction.
In highly advanced societies one has to ponder and see whether this
critical stage has been rached, and if so what corrective action should
be taken to make science and technology continue to serve man and not
enslave him. On the other hand, in spite of their so-called backward-
ness, the poorer countries yet have a chance to learn from the mistakes
of the rich countries in their applications of scientific knowledge and
technical know-how to their situations with a view to avoid such
imbalances. Therefore the theme of this congress, namely appropriate
technology, has a relevance, not only to developing countries but
equally so to humanity in general and such a discussion therefore is
most appropriate to the times whe are living.

The elite in most newly independent countries made a costly mistake
for their peoples by adopting the Western model of development, education
and technology. The conditions in our countries, except the prevalence
of several centuries of a dependent psychological situation, were not
conducive to unquestioned imitation of values, technologies and
institutional forms from Western societies. Yet these were imposed upon
us by the ruling elite in blindimitation. Most of them who took over the
reins of government and policy making from the colonial powers were not
an integral part of the culture, traditions and the mass of people of
our countries. In a situation like this it was not surprising that the
same sophisticated and capital intensive technologies were introduced
to our countries neglecting the realities of our past rich civilizations
and the present rich human resources. The price we have had to pay in the
form of mass poverty, unemployment, social and political unrest and

dependency as a result of neglecting our own resourcefulness and potential is enormous. I believe that appropriate technology viewed from this point of view may well show us a way to the re-discovery of our own potential towards a self-reliant social order, beginning from the re-discovery of man himself.

Sri Lanka has a well preserved and recorded history of over 2500 years. Long before the scientific revolution of the West, the early periods of the Sri Lankian civilization were characterized by a highly advanced system of tank construction, irrigation, agriculture and architecture, which would necessary have required advanced scientific techniques in their fields at that time. All these were integrated with the life of the people so that man was not alienated from himself or his community. The social and political organisations always kept man at the centre so that his ultimate objective of attaining highest possible cultural and spiritual attainments was supported by the techno-economic system rather than was hampered by it. This situation was completely reversed in the approach made immediately after the second world under the influence of the advanced technological tutelage which simply did not fit into our cultural milieu.

Foreign experts, the new missionaries in the post-independence era were advocating high technology and capital intensive projects and industries as the panacea for underdevelopment. A feverish modernisation programma started. Engineers, doctors, scientists and managers were trained abroad and their level of performance was maintained at the same high western standards. Contracts were signed, loans were obtained, heavy machinery were imported, a few factories were put up and at the end of all this Sri Lanka also came into possession of what people now call several 'islands of technological incongruity'. They never got integrated into the total pattern of life of the farmer, villager or the community as a whole.

Appropriate Technology and Buddhist thinking

Technology is only a means to an end. No sensible person will contest the need to eradicate poverty and hunger, the importance of providing the basic and essential needs of the population and improving their standard of life, using technology. But all sensible people should seriously think of especially the human cost of artificially creating endless material wants and the craze for directing all our resources and know-how to increasingly satisfying these. A purely materialistic approach to life will take us no where - certainly it will not take us to increased happiness or the joy of living. Human life is meant for and is capable of higher achievements in other more satisfying fields as well. To people of Sri Lanka cultural and spiritual development is a part of their total living pattern. Technology they select, therefore it should be appropriate to this total approach to life.

Some people misunderstand our total approach to life thinking that we are anti-scientific and opposed to material advancement. They say we are trying to put the clock back. This is a misconception. Far from being discouraged there is clear evidence both in Buddhist and Hindu teachings of the importance of having a sound economic base for the progress of a society. The difference lies in the different approaches to economic development and its end purposes. Lord Buddha in His noble eight-fold Path leading to perfect enlightenment has included High Livelihood as its

fifth factor. In one of his discourses Lord Buddha mentions four cha-
racterₛtics of a rich approach to economic action, namely, (1) Diligence
in efficient productive activity, (2) Preservation of what is produced
and conservation of nature,(3) social milieu in which one works and
(4) a balanced life style in consumption.

The first factor brings about to the participant the benefits of (i) the
joy of personality awakening through constructive and creative labour,
(ii) harmonious social integration by working as a member of a group
and (iii) satisfaction of the needs of life through productive work. In
this economic philosophy there is no in-built motivation of self-
opgrandizement that activate both the employee and the employer. Instead
of productive work debasing them to a lower human relationship they are
being lifted up to higher human levels and relationships. There is no
alienation of the human being from himself or his work. Similarly con-
sideration is given to ecological factors, psychological and social
equilibria and limits to consumption in this type of economic philosophy.
In short we have our own indigenous thinking about economics and develop-
ment and the type of technology we choose, evolve and develop may well add
a new dimension to the experience already the rich countries have gained.
Together we can learn from our experiences and develop a new techno-
economic base built on non-exploitation, sharing, equality and respect
for one another. Advanced technology has failed to do this. Can appropriate
technology in its freshness of approach achieve this?

The danger of elitism -

Please, permit me to caution you on just one of several pit-falls we
might have to avoid in developing appropriate technology. We are living in
an era of liberation. When oppressed people wake up, the oppressors
also hasten to play the role of liberators. When people demand partici-
pation in decision-making the bureaucratic establishments are the first
to support the cry and 'peoples' participation becomes another jargon
in their development vocabulary. The so called first and second develop-
ment decades of the United Nations bureaucracy provided the peoples of the
poor world with tons and tons of such manipulative jargon without much
concrete benefits to the people to match them.
Appropriate or Relevant or Intermediate Technology with Dr. E.F. Schumacher
as its prophet may draw lots of disciples from among the privileged both
in the rich and the poor world. There is nothing surprising in this as it is
the nature things do happen. However if appropriate technology becomes their
preserve and if it runs out to be another elitist exercise to which poor
have no access, all your endeavours will end in disappointment and
frustration. Therefore I strongly believe that all appropriate technology
programmes should be directly related to concrete development actions
where the beneficiaries have direct access from problem-identification
stage to problem-solving experience so that the programme becomes their
own.

Let me illustrate this. When I first met a TOOL-representative I brought
him face to face with a group of unsophisticated youth who were trying
to irrigate their dry zone land. Together they studied the problem and
within seventy two hours they had their first crude windmill turning and
lifting water to their rice fields. A shared psychological infra-structure,
a ahared social milieu, a shared concern and a shared joy of achievement
brought them together in a long term partnership of true liberation-

cooperation. They established a firm partnership between Sarvodaya and
TOOL movements. This type of action-based, man-to-man relationship can
prevent appropriate technology becoming a mere fashion of the times on
one hand and help it develop as a sound people's movement raising their
productive levels and quality of life on the other hand.

against a human technology

This brings out a clear difference between the two approaches - the
monolithic advanced technological approach and the appropriate techno-
logy approach. The latter has to work mostly with people, less with
systems. Hence the practitioners of appropriate technology have to develop
a humanistic philosophy and an inward vision into their own personalities.
As appropriate technology by its very definition has to be different
from country to country and even between one place and another in the
same country it will not have the omni-present mechanistic uniformity
that characterises a vested interest such as technocratism. Therefore the
binding universal feature of appropriate technology is a sound system
of human values or what you may call a humanistic philosophy.

The Sarvodaya Shramadana Movement

Sarvodaya is such a humanistic philosophy. The word, Sarvodaya, means the
thought of the awakening of all - the well-being of all, or respect for
life. When one accepts this idea as the centre of his or her philosophy
of life, invariably, such a person is motivated into sharing his or her
time, thought and energy (in Shramadana) to remove the causes that bring
about suffering in others. When as a result of one's efforts the less
fortunate, especially the most deprived in a society become free and happy,
that in turn brings about a detached joy in such a person. A life dedicated
to earning that joy of service becomes a life of psychological equanimity
and peace and is unshaken by the vicissitudes of life. Through such persons
a non-violent but a total revolution can be generated involving hundreds
and thousands of willing hands to work for self-development. The Sarvodaya
Shramadana Movement in Sri Lanka has successfully shown how a thousand
villages could be awakened to their own potential through such motivated
individuals. The movement out of its experience over years working with
thousands of people has developed very precise and logical techniques of
social development linking the traditional with the most modern; without
destroying the existing social tissue it seeks to implant the best social-
ly appropriate scientific and technological advances in response to the
hopes and aspirations of the people whom it seeks to serve.

- working at village levels -

In the Sarvodaya Village Development Scheme in Sri Lanka, before the intro-
duction of technology, we seek to lay down three levels of infra-structure.
Firstly, a psychological infra-structure making individuals aware of the
causes of their poverty and possible solutions. Secondly, a social infra-
structure, organising the people for mass action to solve their own pro-
blems and demonstrating the effectiveness of mass activity, organising camps
in which the participants from within and outside the village (quite often
from foreign countries too) give their labour (Shramadana) for construction
or fulfilling a basic utility in the village such as construction of access
roads, a water reservoir, a school or a community hall. Next, based on
these experiences the social structures such as pre-school childerens'

groups, out-of-school youth groups, farmers' groups and mothers groups are organised using village leadership which emerge during these exercise. Thirdly a physical infra-structure follows in the form of roads, water supply facilities, meeting places, etc.

- and participation training

These stages are followed by training programmes for selected youth for both community leadership and for acquisition of appropriate technological skills conducted in Sarvodaya development education and training institutes. The training itself is not formal or rigid. It is a process of learning together by problem identification and finding solutions. By such 'participation training' four main objectives for rural appropriate technology have been evolved:

1. To discover, organise and upgrade the available knowledge and know-how in the villages.

2. To develop and utilize to the maximum individual talent and labour for co-operative effort.

3. To concentrate on goods and services beneficial to the community, and

4. To protect and conserve the resources and environment.

With these guide-lines it is possible for the trained youth to choose in-novations most suitable for a particular situation. They also on their own return to villages with the assistance of elders and other members of the community formulate a total plan for the village development. This plan would not embody only industrial and agricultural projects but also such factors as nutritional supplementation of food to correct diet deficiencies, pre-school and medical care as well as long term plans for ensuring economic and social security for participant youth. To supplement the asset of labour they possess, capital requirements have to be found for them. For this we have organised a revolving fund. At this stage every attempt is made not only to couple the grass-roots development plan to those of governmental regional plans, but also to utilize the services and institutions of government for its implementation.

I gave this experience to you to illustrate one strategy that could be used to bring appropriate technology direct to the people at their own initiative and suited to their own situation. On this grass-roots foundation, appropriate industrial techniques and systems, to make the fullest use of human resources and to make them most productive with material resources available in the country, can be developed. In Sri Lanka suitable institutional structures such as divisional development councils, Agricultural Productivity Committees and Self-help Housing Societies are also being developed by the government as safe-guards against abuse by vested interests. It may well be that with correct political leadership and social consciousness on the part of the people, a country like Sri Lanka can develop appropriate technology as an important part of the national strategy for development.

Conclusion

As the appropriate technology concept is new and is just getting off the ground it has its own advantages and difficulties. The advantage of beginning with the involvement of the poorest and neediest in developing countries should be foremost in our minds. However the political and economic dimensions of an expanding appropriate technology movement both at national and international levels should not be forgotten.

Public and governments in our countries have to be more and more enlightened on our approach by practical pragmatic programmes. In place of high level, costly experts, concerned and motivated mid-level scholars and students from universities and technical institutes and other skilled people who can love and live with common people should be facilitated to work in developing countries and, together with them, evolve programmes.

New concepts and strategies for research have to be developed. In short a vast untapped area of thinking and action lies ahead of us. I believe that this congress will give all of us encouragement, and hope, to accept these challenges of this much needed task for humanity.

Small Industries in Tanzania
B P Mramba

It gives me great pleasure to be able to share ideas with you, to learn from
you about the various issues concerning appropriate technology. I would like
to make one or two introductory remarks. I would like to emphasise that I
have not been in touch very much with the TOOL Foundation as such or with
other organisations that have been concerned with appropriate technology. I
am only now beginning to fall in love and I don't know whether this eventually
will lead to a natural marriage and honeymoon and so forth.

The Small Industries Development Organisation of Tanzania is only two years
old. It is a parastatal organisation, which means an organisation which has
operational freedom. This is a complicated subject, simply remember that it
is essentially a government organisation which operates and tries to develop
small industries in rural aereas. The short name for this organisation is SIDO.
This organisation is only two years old. During this time we have very much
been concerned with questions of organisation, questions of structure, with
questions of approach, style and various other things which all have to do
with building up an organisation.

Therefore we cannot boast of any specific results which one can quote in an
international gathering like this. But I think we can speak about our theories
in the last two years in.the hope that perhaps we can learn from each other.
I must emphasize that SIDO is officially a political organisation. My friend
from Sri Lanka has been speaking about his movement which I gather is more a
religious movement. We are a political organisation. I like to emphasize that
point not simply because the policy on which we have been founded is essential-
ly a political policy but also because we feel that the whole subject of small
industries is really a movement and it must be looked at as a movement. It is
not a business where you have to deal with cash flows and the kind of things
that you have to do within industries. You look at it first and foremost as
a political movement and secondly as a business.

I'd like to emphasize that point because as we go along and enter the dis-
cussion we should not lose track of the official effort that we are going to
make.

I intend to discuss the role of technology in rural development in Tanzania
as a major element in our socialist society. To begin with, the framework
is outlined in which any discussion of technological development must be kept.
This framework leads us to identify the industrial priorities. Next, the role
of SIDO will be reviewed stressing its strategy and problems and in turn
suggesting areas where outside assistance could make a significant contribution.

Tanzania is 365,000sq. miles in area, with a total population of about
15 million people. It is endowed with a variety of natural resources such as
forests, lakes, the ocean, minerals, rain, sunshine, rivers, fertile clay
soils, wild animals etc., cattle, sheep, goats, poultry, agricultural products
such as sisal, coffee, cotton, pyrethrum, fruits, vegetables, cereals, oil

seeds etc., etc. These resources are not all being tapped at the highest capacity possible although in some cases a beginning is being made.

The majority of our people - about 95% - live on subsistence agriculture. Tanzanians are among the poorest people by international economic criteria, being part of the Fourth World.

In recent years tremendous efforts have been made in the establishment of ujamaa villages based on traditional socialist concepts. These villages have their legal and administrative set-ups through which decentralised democratic decision-making is possible. The objective is to establish village self-reliance in the social, economic and technological senses as far as possible and at the same time to enable the government to provide essential services such as schools, medical facilities and clean water to these villagers.

Tanzania is a one-party democratic system in which political socialisation at grassroots level is very high. During the last 15 years of our political independence the people have been able to attain political unity and stability of a rare kind in Africa.

In other words, Tanzania has attained the conditions necessary for rapid development: political stability, rural organisation through decentralised decision-making and the availability (actual or potential) of various exploitable resources. It is in this light that the discussion on the role of technology in the Tanzanian context must be seen.

Tanzania is technologically not very advanced. Traditional Technology for various activities has been in existence for ages although some of it - like iron smelting - has been rapidly on the wane, for various reasons. Therefore we find it necessary to import the technology needed for rapid economic development, especially where large scale operations are involved. Imported technology is expensive, sometimes inappropriate or irrelevant and tends to create a lot of problems.

The framework of technological progress

Somehow it is a fundamental viewpoint that technology and technological development never exist in a political and social vacuum. The role of technological development in Tanzanian society is to contribute to its socialist transformation. It means that technology is an instrument to be made available in the hands of our people to develop their skills and to make better use of human as well as material resources. It also means that the technology to develop must be within the capability of the people in terms of capital and know-how. It is important for us to meet the basic needs of food, shelter, clothing and meaningful work for every member of our society. But it is even more important that the development of the productive forces takes place in a political environment in which every family contributes to the decision making. Technology in this context is therefore also an instrument to achieve self-reliance, which is basically the ability and will to take responsibility for the development at all levels, knowing that it will only come from our own efforts and resources.

As in essence the term technology combines the whole process of production and consumption, the most important decision to make is on the product itself. What are the needs to satisfy through the planned development of

our productive forces? It does not take much imagination to realise that planning in a poor and underdeveloped society like ours is a matter of strict choices. At all levels and at any time from the village to the nation, the choices are determined by our poverty and not by plentifulness. It is not so much a matter of choosing between essentials and luxuries, but between the essentials themselves leaving some of them undone.

The priorities from which decisions are to be made on what to produce, necessarily reflect the position of our peasants throughout the country. First of all, sufficient food must be produced to ensure that everybody will have a healthy diet. Secondly, essentials like clothing, adequate housing, water, schools and preventive medical care must be considered. Thirdly, investment goods within our capacity of skills and materials such as hoes, ploughs, carts, water pipes, tiles and bricks, etc., are essential. Fourthly, we must produce raw materials for our domestic industries, e.g. cotton or copra. Fifthly, goods for export must be considered to obtain foreign exchange for necessary imports.

In other words, priority in the application of technology should be geared to the need to step up agricultural production and to process or manu- facture products based on or supportive of such agricultural production. Next, priority should be in those areas which by satisfying the essential needs of the masses, enable them to improve on the quality of life in their environment. It seems a stress on man's development as opposed to sheer material progress which is often mistaken for development in economies which have attained "growth without development".

Industry and especially small-scale industry will have an important role to play in meeting these basic requirements. But the dispersal of industrial activity to the village and district levels will in itself be an essential agent of transformation within our socialist framework of development. The aim is not alone to increase the surplus of the community, but also to eliminate the geographical inequalities of material and social welfare.

Technological advancement is part and parcel of this process. But since we want to develop a socialist society, we cannot accept technology as "technicalities" justifying themselves, nor can we permit unilateral techno- logical thinking to dictate our choice of production processes or techniques. Although we are poor, and poverty certainly limits our choices, technological development has nevertheless a much wider scope than economic profitability. We may therefore have to combine different levels of technology in the same work situation depending on circumstances. Thus power driven tools may be introduced in a rural workshop as a natural step towards the development of the productive forces. Machine tools do not necessarily kick off the less advanced production technique previously relied upon. In a socialist self- reliant society a combination of less and more advanced tools may be desirable, the choice being basically a political decision in which the utilisation of all human skills and material resources counts more than profitability in a capitalist sense. I wish to emphasize this point because I believe that . developing countries such as Tanzania can not operate on the basis of a technological continuum which progresses with time step by step like a child moving from kindergarten to the tenth class.

The role of SIDO

The Small Industries Development Organization (SIDO) was established in November 1973 by an act of Parliament as an independent parastatal organisation to promote and provide services to small industries in the country.

Since its inception SIDO has established the following main programmes:

- Training of Staff and small industrial entrepreneurs locally and abroad. Various training centres have been established for the training of local entrepreneurs.

- Supply of machinery and equipment on hire purchase basis on soft terms.

- Supply of raw materials to small industries.

- Market research and sales promotion for small industrial products.

- Financial advice on bank loans to small industries.

- Managerial and technical advice.

- Feasibility studies and Industrial Surveys.

- Industrial Estates construction.

- Handicrafts marketing and development.

- Regional Extension service.

In line with the decentralisation policy of the government SIDO has established Industrial Extension Units in each of the country's twenty regions.

Each Regional Unit is manned with a SIPO (Small Industries Promotion Officer) who is a generalist with the main functions of promotion, motivation, co-ordination and "fire-fighting" in general. He is assisted by an economist and recently each regional office has been allotted an engineer trained in small industry techniques.

It is envisaged that these extension engineers will play a fundamental role in the dissemination of appropriate technology in the rural areas. Keeping our priority list in mind agricultural production will be the central focus for our dissemination efforts. SIDO does not own or run its own industries; rather it plays the role of catalyst and consultant.

At present the Tanzanian small industry scene may be broadly described as consisting of:

- Craft artisan and cottage industries in the rural and urban areas.

- Village industries processing various agricultural and forest products mainly in urban centres.

- Modern small scale industries which are few and mainly in urban centres.

Hitherto the small industrial sector has been informal and urban-oriented. SIDO's task is to reverse this trend in favour of the rural areas: to enable the rural areas to sell rurally manufactured goods to the urban areas and to halt the rural brain drain to the urban areas rather than the other way round.

The question is how does one do this? We are open to suggestions but at present we feel that we can achieve this end:

- By training villagers in various skills appropriate for village production and then encouraging them to start on their own. SIDO is already conducting courses in fruit and vegetable preservation, lime production, handloom weaving, woodwork, blacksmithy, sheet metal work, pottery and ceramics, oil extraction, leatherwork, and bamboo craft to village trainees and using techniques suitable for village production.
  To ensure that trainees do not escape in search of urban employment we do not give certificates on completion of such training. Instead we encourage them to return to the villages which sponsored them in the first place by ensuring that they have the tools with which they can embark on immediate production. Close collaboration with the local administration and party branch is established in recruiting trainees and in resettling them to ensure success.

- By improving on what there is already in terms of better tools, production techniques etc.

- By establishing demonstration activities through "model" industrial units demonstrating certain techniques to the people with the hope that they can be multiplied several times by the people themselves through training. SIDO has planned model projects in paper production, sugar, gas production from cow-dung, construction of kilns for village bricks and tiles, production of farm implements, agro-based products etc., all designed for village level production.

- By constantly doing research on and developing appropriate technology suitable for being rapidly disseminated to rural people. SIDO is in touch with local and international sources of appropriate technology e.g. ITDG, London, which could be transferred for use by us.

- By supplying models and proto-type equipment and tools for direct production by the people. This applies mainly to tools and equipment which can be locally fabricated thus increasing our self-reliance.

- By encouraging large scale organisations to subcontract their requirements to rural manufact rers thus leading to the establishment of modern small industries in the rural areas. This programme is still in its planning stage.

- By supplying standard workshop drawings and layouts for various rural industries. We are working out various guides on how to establish certain rural workshops which could be easily under-stood by the rural craftsman and administrator.

- By encouraging local innovations and developing capacity for local production of essential tools and equipment for self-reliance. This idea is still in its infancy.

Training is a critical input in this exercise as many villages lack both technical and managerial skills. This means that a lot of money will be required to achieve substantial results. A lot of effort and money are also required in establishing appropriate working sheds, power water, roads and other infrastructural requirements for rural industrialisation. There are villages where good beginnings are already evident but for most of them there is yet a lot to be done from outside, since very few are able to meet the costs on their own.

Tanzania's main enemies are poverty, ignorance and disease. There is a kind of vicious circle between them. Thus may be we are poor because we are ignorant or we are ignorant because we are poor, or may be we are diseased because we are ignorant or poor etc. This sometimes makes it difficult to choose the point of attack: do you first eradicate ignorance or poverty or disease? From a point of view of technology transfer it may be that ignorance and poverty can and must be simultaneously attacked. We must for example introduce better and cheap farming tools and techniques to the peasants if we want them to step up agricultural production, increase their incomes and pay for other needs. We would do best to train them how to make and service the tools locally using local materials as far as possible. This must be done in as practical a way as possible and on a mass scale. Technology must be made so, that it lies within the reach of most ordinary peasants. It should be part of their culture; a way of life. This means that it should not be commercialised to the point where it increases their general depencency and develop a rat-race mentality at village level!

It follows that the task of introducing and disseminating technology can not be left to chance nor to private philanthropic initiative. It must be made a part and parcel of overall public policy and practice and should be largely financed by the public. Well-wishers can supplement the public effort in such a way as to ensure that the benefits do not eventually accrue to a few individuals. But in so doing, care should also be taken to avoid the dangers of bureaucracy. Sometimes the cost of administering small programmes for rural development becomes more than the value of the equipment or capital involved because of complicated bureaucratic practices and procedures. It is sometimes forgotten that rural development requires a very unorthodox approach because one is operating mainly on the basis of approximations, intelligent guesses and in situations which defy most theories. Sometimes one has to operate on the basis of potentiality and hope, not real statistics; on the basis of arousing interest and giving incentive; on the basis of producing a demonstration effect and even on experimentation. Without this kind of approach, technological spread and self-reliance in our rural areas will be too pedestrian and will take too long to produce the required effect.

We in Tanzania are quite clear about what kind of technology we need and why. We are making various efforts to spread it among our people. We can not boast of great achievements but we are convinced that we are on the right track. The task is difficult; there are problems to be overcome but the future is promising. Our limited experience tells us that it can be done with a little more effort and determination. We welcome ideas and suggestions for improvement and are gratified that the Tool Foundation is keen to play its part in this exercise. We are, however, poised for action on concrete projects as we really are living on borrowed time in this very important task.

The theory of
the disappearing middle
E F Schumacher

Ladies and gentlemen, the subject given to me is the framework of appropriate
technology and I'd better tell you about my framework, which of course, is
quite different from that of the previous speakers; for they themselves live
and operate in a so-called under-developed country; my own framework may be
put into a few figures.
20 years ago when I first ventured into a developing country I came to the
conclusion that, what we were doing under the auspices of foreign develop-
ment aid, was doing more harm than good.
15 years ago I thought I could see where we could do more good than harm, and
I started talking about the problem of appropriate technology. It took a
long time I am sorry to say.
10 years ago, with some friends and a lot of encouragement we started to
organize the effort to bring the ideas down to earth
about 5 years ago, we came to the conclusion that the problem of technology
is not one simply for the developing countries but also for the developed
countries. That is the framework. It is 15 years ago that it seemed to us
that this question, of what is appropriate technology, had to be raised.
The word appropriate is really a question raising word. Un-appropriate is of
course un-appropriate.
And the answer seems to be, for the conditions of the rural areas - and it
is in most conditions where 80-85 per cent of the population is actually li-
ving - that what would be appropriate would be something intermediate. An
intermediate technology, something very much better than what they have,
but very much simple-, cheaper, easier to maintain than what the highly
sophisticated societies are currently using. This is the concept of an
intermediate technology.

Now, I will introduce you, if I may, to a sort of game of inquiry into
intermediate technology. I was, about a year ago, in one of the most
prestigious and most wonderful institutions for technical development,
particularly specialised on machinery , and they showed me around - and
you know what one can do these days in terms of textile machinery, it just
makes your eyes fall out of your head, evefything.

I inquired how much these machines cost: I was told that this machine
cost something of the order of 500,000 Dutch guilders. A lot of money.
After another quarter of an hour, I said to this professor:

"It seems to me now, that you can draw everything. Why don't you stop?"

"We have got so many intelligent people that they will always find
something to improve upon. You cannot stop progress. What's wrong with
it?"

"What's wrong with it, I said, what's wrong with it? I'll tell you, this
machinery which now costs 500,000 guilders, after you have made some more

improvements which you don't really need, it will cost you a million guilders."

And then the professor said to me, "What's wrong with that? It will be 50 per cent more expensive but 60 per cent better and more efficient."

And I said: "Look, what is wrong with it is that this beautiful way of producing textiles becomes more and more reserved for the people already rich and powerful. What about the little people in this world?", and then this really thoughtful man, looking deeply disturbed, saw the point.

That these wonderful things are wonderful only from a narrow point of view, but not from a human point of view or from the point of view of humanity.

And he said, "But what can I do? I can't stop."

"I know you can't stop", I said, "but you can create a sort of counter-weight. You have all those marvellous instruments, around you all these resources. Why don't yo set aside a little bit to try to create the technology for the small countries and people, who are not rich and powerful. What have you ever done in that respect?"

And he said, "Nothing". It had never occurred to him.

And then I expounded to him the theory for which I have not yet found a better name. Perhaps some of you can help me. I call it: "The theory of the dis-appearing middle". Roughly speaking, it is simply this, that on the road of technical progress you have stage 1: -that is simple tools; stage 2; -which is something already more sophisticated and perhaps more efficient, a little move on to stage 3 and stage 2 dropped out and you move on to stage 4 and stage 3 drops out. It is like in a bookshop, you can get the latest publications of the classics. The middle has dropped out. And I will recommend this to you as a thought for verification.
The law of the disappearing middle is our biggest problem, not only in the under-developed countries, but with ourselves too.
The one I am now thinking of may not bother you as much in a relatively small country like Holland, but in all the bigger countries it is crucial, mainly because the middle has dropped out.

What remains is only the most primitive or the most expensive and sophisti-cated and the latter only fits the biggest nations normally in mass production technology, when you want your biggest market at the doorstep. Normally it is so sophisticated, that you want to live where you only have to go around the corner to find a first-class specialist on this, that or the other. And so this technological development, the more successfully it is moving into higher and higher stages the more it becomes reserved, not only for the people already rich and powerful, but geographically speaking, for the nations already the most densely populated, I believe that in our universities we still educate economists (God bless them, I am one of them) into the theory of equilibrium. Remember that when things get out of step, that there are natural forces to bring them back into step. The truth of the matter is that the technological development has produced the law of dis-equilibrium, namely nothing succeeds like success, nothing stagnates like stagnation, and nothing fails like failure. To get out of that has become quite fantastically dif-ficult. That is the tragedy of this whole problem of development.

And so we have a pattern of settlement which is pathological. Even in Britain many people talk about Britain as a tightly packed little island, we are tightly packed my foot! I mean more than half the area is scheduled as "development area" because it's under-populated. And then, other areas are so enormously congested that of course you cannot get clean air, clean water or anything. If anything, there is only a tolerable noise level. In the U.S.A. statistics have been put out, that in this vast country, 70% of the population lives in a few conurbations which cover, between them, 10% of the area of the country. And if you go one stage higher on the scale you find that 82% of the population lives in conurbations which cover 2% of the area of the country. And of course these 82% are monstrously congested with a truly expensive and very low standard of living (very expensive and very low). And then on the other hand there is this vast emptyness. In other words a pathological pattern.

Now this pathology we have to understand what this is about. We got all we need as an explanation that people just want to go to the cities, but ask them, they don't want to go to the cities. Not where there is that congestion. They'll say, I must go, because I haven't got a job in the village. Now these points have been made by the two previous speakers; development, if it does not produce activity outside the main conurbations, is speeding up the vide. It will bring more harm than good, no matter what the statisticians say. The statisticians don't know anything, they just love figures. An index of urbanization means nothing unless you declare at the same time that it is one huge megalopolitan area. I apologize for these words, to me there are more words for such a thing. All I want are accessible cities dotted all across the country. Of course you want urbanisation but not all in one place. You want a pattern of urbanisation so that anybody in the rural area has easy access to a worthwhile town.

That is as you see the problematic created by a very one-sided development of technology and therefore, the question arises whether we are thinking mainly of the developed countries or the developing countries; is there any possiblity of creating a counterweight I have learned if I may say so, that it never pays to be against anything that exists. Because normally, that has the power. But it does pay to find out where the gaps exist, where new possiblities can be created, and in these streams of technology the gaps are as I said, due to the law of the disappearing middle, in the middle!
In the middle there is an emptiness and if you can fill this gap, one can at least make it possible for people to stay in the rural area to make a decent living in the rural area.

It has been mentioned before, it is not for us to barge into developing countries and tell the people "now get out of my way, I will show you all the wonderful things you ought to be doing, assuming you are already rich". It's not very healthy. But the best we should do is perhaps to watch them, what are they doing, search our own minds, and our own experience, whether there is anything we might be able to suggest to them, so that what they are doing, they could do better. It's a most non-agressive attitude.

And then you will find in our working experience, I apologize to my friends that I mention it, that on the whole, this little peasant as far as his cattle is concerned, knows very much more than we do, very much more.

And when he becomes sullen, and when he does what so many industrial workers do when they are confronted with people like myself who don't know anything about the reality but can talk clever, they turn stupid.

Suddenly they turn stupid. And you ask them what is two and two and they'll say "I don't know".

"Don't know what you are talking about."

Some people get riled by this. I remember one African country, where an agency had brought new excellent agricultural methods which enabled the peasants to double their yield. It worked, and these peasants were delighted. And then the mission left (and I might disclose the mission was not from Britain) and they said we'll come and see you in a year to see how you are getting on.

They returned a year later and they found the peasants had reverted to their previous methods. So they were really disappointed, in fact, quite disgusted, and went home and talked ill of these peasants.

It so happened that we had some colleagues in that particular country and it could be conveniently arranged for them to look into the matter. And we said to them: "Look, no one can tell us that the peasant doesn't know on which side his bread is buttered. Why did they revert to the previous methods? Just have a good look."

The answer was perfectly obvious. In this society, mainly of farmers, they had no access to any particular market, except miles and miles over rough country. And the only beasts of burden were the women. And the women said, "you have to choose between us and the second crop."

And these really clever peasants chose the women and not the second crop. It was then that constructive work could begin and one could see what the real problem was. The primary problem is not how to grow the double crop, that problem is mastered, now to get it to the market. In other words, one has to watch it very, very carefully. And this thing immediately became a problem of technology, because one could not wait for an elaborate infra-structure, wonderful roads and lorries and there were possibilities to do it with oxcarts.

There was no tradition of building oxcarts in this particular country, so it was necessary to get a very simple design en we got it from a far northern country, called Scotland, where they still have these primitively designed things.

We had to adapt this for the local carpenters. There was still a problem. They were good carpenters but they could not get or make the metal parts. But it turned out that there is in Africa an inexhaustable resource of metal parts, namely wrecked motorcars and we organized this trashdealer to recover suitable metal parts from those wrecks, assemble them into do-it-yourself kits, which could be issued to the carpenters and they could build their oxcarts. And that solved the problem and they took to it like ducks to water.

There was no problem of a cultural gap. When people talk about the cultural gap, I become suspicious. They do not understand the problem.

There is no cultural gap. There is only one advice and, thank God, it is as easy as that. Now on this technological side, it is hard work because this simple technology on the whole requires more brainpower than just making things already unduly complicated still more complicated.

To find ones way back to the principle, so that quite simple people who don't hold certificates - they deserve them but they don't get them, you see - can make it their own and also, no doubt, can further develop it, needs the import of high level intelligence and the problem is: how can you get this organised, because I am speaking entirely from the point of view of people in developed countries who want to be helpful. And, all I can say is that after talking around, we came to the conclusion that, in some countries, aid giving countries that is, this can be done best by government, by the civil service. They are most trained to do these things; they are the administrators, some more, and some less, bureaucratic.

Sometimes, it can be assumed that this is a job to be done by business; no, it can't be done by business, not as such, because business operates mainly under quite different laws and they sit on the sidelines and wait till negotiations are ready so that they can sign the contract. But to create an appropriate technology for a different situation to that in which they mainly operate is not their business. And then, there is an angel that says "this could be done by academia, by the universities." It could; we all have the highest respect for academics, particularly standing in a place like this! They have research and we notice, of course, not in this country, but in countries I know well, that they are very intelligent but sort of playful souls - they fall in love with the problem. They take it up. They solve it. And then they file it away, marked Top Secret. They have lost all interest in it. This is, perhaps, slightly exagerated but they are no normal channels by which the findings of research can get among the people.

From these three - the civil service, business, academia - it seems that no one of them can do it. The only real answer is that they can do it together. And, in order to formulate this in a catchy sort of way, we call it the A.B.C. combination. A are the administrators, B is business and C are the communicators, the people of the word, the media. If you can just achieve the A.B.C. combination, then everybody is happy. I mean, let's face it, out of A, B and C, everyone has a very low opinion of the other two. But when they actually meet, they find that they are all perfectly hard-working people, and fine people and this situation has to be created, because it is a difficult job, and to take a difficult job one has to tap the sources of the scientist who can actually do it. Previous speakers have already said this.

It is all very well to have research, to have theories about it, but in the end time is running out; we have to get things done and find ways of getting them done. For that, we have to organise and try to organise without falling into all the traps of bureaucracy that have already been mentioned.

That means that the organisation must have the clear cut aim, mainly to weld together A and B and C. In this respect, the change that we have now seen in the world at large, namely that the question of technology has to be raised not only in regard to the developing countries but most seriously also in regard to the developed countries, facilitates this process. Now, I find it is possible to go and approach business and talk to them and they may say "Yes, we are not terribly interested in what goes on in Sri Lanka or in Tanzania."

They say "our business is somewhere else" but now one can speak to them convincingly and say "Look, it is the same sort of problem. Would you not be much better prepared to meet a very uncertain future when, for instance, you set aside a little bit of your research and development effort to look at the development of what you call miniplants?"

I came across this problem many, many years ago in Tanzania, in the wonderful southern district town called Mbeya. There, you have everything you want for making cement, but they don't make cement there. They must get all the cement from the plant near Dar es Salaam, over an enormous distance. Now, of course there is a railroad, but at that time there were only very insufficient roads. I asked the government, which is very interested in creating jobs in the rural areas, a damned fool question.

"Why don't you make your own cement in Mbeya. You have got the raw materials all here". They said, "well, everybody tells us that this would be very uneconomic." So I started arguing,"Look, it can't be as uneconomic as it is to make it in Dar and ship it all the way down" - that convinced them.

How much did they require? Well, "we require something in the order of 20-thousand tons a year, whereas the only economic size of plant is 200,000 tons annually. But we can see if we can make the 20,000 tons here; what to do?" I had to say "Forget it, no-one in the world is going to offer you a mini-cement plant, because your demand, no matter how interesting it is, is not effective. If you want a 200,000 ton plant, you can have it at the drop of a hat if you have the money, but a 20,000 ton plant you can't get."

Equally, in Sri Lanka, there are a lot of sugar estates, but there is only one big sugar refinery and now, with increased freight costs, the cost of shipping the sugar all the way to one refinery is, in fact, uneconomic. So, they are crying out for a mini-plant. But, unless you get in touch with this network of appropriate or intermediate technology which is coming into being, you can't find one. The Sri Lanka government has been trying to find one, but they just couldn't.

My time is up, so I would suggest now that the task is to really get going and organising, non-democratically, to get A and B and C together, and to fill in a fruitful place, a place in an international network.

I am delighted that this is gradually appearing and that we do not let down a culture like that of Sri Lanka or Tanzania, and many others, by being too individualistic, too administrative, which is extremely confusing. So, I am delighted that we can talk to intermediate or appropriate technology itself in these countries, so that a network can come into being, because these apples don't fall into your lap, they have to be worked for.

May I thank the organisers for having invited me here. Nothing will give me greater satisfaction than to be able to look forward to a certainly intensive cooperation from London with Holland with Sri Lanka with Tanzania in this situation. Thank you very much.

Research Policies

Dr E van Spiegel

Introduction

It is desirable on such an occasion as this that the audience's expectations
should be matched to those of the speaker, all the more since the information
given in the Dutch descriptions in the Conference Programme on the subjects
to be covered differs slightly from that given in the English. Specifically,
I do not intend to go into any great detail on the subject of finance, even
though both texts - and particularly the English phrase "government contri-
butions" - would seem to invite me to do so. This is not because the Minister
for Research Policy has no financial resources at his disposal: he has, after
all, plentiful opportunities for exercising influence through the science
budget; rather is it because questions of research policy (and many others
too) are in my view often too readily classified under financial headings.
There is, however, one general point that I must make on the subject of
finance, and that is that no new work can be started under present circum-
stances unless some existing project is wound up. There is no new money
available for new priorities: if we want to introduce new priorities, we must
reorganise our present programmes. I fully endorse the words of Mr. Pronk,
the Minister for Development Cooperation, speaking at the Conference of the
Netherlands Universities Foundation for International Cooperation (NUFFIC)
on 15 December 1975: "The incorporation of social aims into scientific
research at the universities does not mean simply that a new source of finance
is being opened up." On that occasion Mr Pronk was arguing for a different
share-out of the allocations from the first and second flow of funds.

This afternoon I hope to suggest ways in which the meeting of research policy
and development cooperation of which Mr Pronk spoke may be arranged, and I
should like first to look at the current state of research policy in general
and of research related to development cooperation in particular. Then I should
like to discuss the subject of appropriate technology from the research point
of view, with particular reference to the way work in this field might be
divided between university and non-university institutions.

I shall begin by stressing the organisational side of the policy - the
structural side - en then go on to look more at its contents. A parallel may be
drawn here with the state of affairs in research policy. We are currently in
a phase - whose indispensable direction was given by the Memorandum on
Science Policy - in which structures are being established. Systems for
consultation, coordination, planning etc. are naturally not an aim in them-
selves: they are instruments to be used for the realisation of the social and
scientific aims which may be set for science policy.

Science policy is not, however, simply the setting up of structures: it is
concerned much more with discussions of the aims of science, the development
of criteria to be used in assessing research, the choice of priorities and so
on. All these activities require the structures of which I have spoken, but

we must not wait until the structures are fully developed before we attempt
to distinguish excdllence, to analyse the contribution science can make to
the solution of social problems, to detect gaps in our scientific knowledge
and to identify the autonomous developments which take place in science.
Science policy in the Netherlands and elsewhere must try to find a balance
between the attention that structures and systems are attracting at the moment
- and fortunately so - and interest in the actual subject-matter of research.
We must evince more interest in the substance on research in future - and
here perhaps the government has been the greatest sinner. Staff and facilities
(the problem of organisation again) are still lacking, however, and this
affects both the coordinating Minister for Research Policy and the Ministries;
but much is currently being done to remedy the situation. The dialogue involving
government, science and society can, I believe, gain greatly in significance
if it does not restrict itself to financial and material means but also covers
the essence of research.

New structures in science policy

Coming now to the systems and structures envisaged in science policy, I should
perhaps begin (given that it is now fourteen months since the Memorandum on
Science Policy appeared) by refreshing your memories. The Memorandum makes
an organisational distinction between university and non-university research.
I should emphasis that there is no rigid division here: non-university in-
stitutions will also be able to apply for finance from the secomd flow of
funds; and university research will also come under the Sector Councils. The
distinction arises primarily from differences between existing structures
(although there are clearly also functional differences between the two cate-
gories of research). This distinction is pragmatic: as new structures are
established close links will be sought with what already exists. The pro-
posals for the organisation concerned with the second flow of funds, the RWO
(Raad voor Wetenschappelijk Onderzoek, Research and Development Council),
have been grafted onto the pure Research organisation that has existed for
25 years. A number of functions will, however, be strenghtened: coordination
will be given greater weight by the extension of the "study group" system.
In addition the RWO will have to pursue an active policy supporting and
stimulating selected areas of research. A start has already been made on
this in the social and life sciences.

This is the right place to point out again that the restriction to pure science
implied by the old ZWO (Zuiver Wetenschappelijk Onderzoek, Organisation for
the Adavncement of Pure Research) no longer exists in the name of the new
RWO - Research and Development Council. The reaos behind this change was the
somewhat forced and simplified distinction between pure and applied science is
not at all clear in practice. The distinction also implies that research can
be either of importance to society or of importance to the progress of science,
whereas in fact (and this is true both for single projects and for whole areas
of rsearch) much research is socially and scientifically important.

I shall not go any further into the consequences of this for the mode of
operation of the RWO (a working party of broad composition is currently
engaged on the question): my intention was chiefly to draw the attention
on those of you who are currently involved in research into appropriate
technologies to the possibilities offered by the second flow of funds.

Sector Councils

I should now like to look at the organisation of research with primarily
social aims undertaken outside the universities, and that means at the Sector
Councils. The principle behind the Sector Councils is that programmes of
research of direct social importance are best undertaken in and after con-
sultation between the various groups involved; these being the research workers
themselves, those who use or are otherwise interested in the results, and the
government. The Sector Councils are intended to function as consultative
bodies in which - in a sort of supply and demand situation - the three groups
involved meet. The groups are:

1. research institutions active in a particular sector;
2. social groups who use or are otherwise interested in the research concerned;
    and
3. the government, i.e. the Ministries involved and the Minister for Research
    Policy.

The Sector Councils make recommendations to particular Ministers on research
policy in one sector. I shall return later to the question of what "sector"
means. The intention is that the recommendations should be made in the form
of a long-term outline plan for research. The Sector Council presents the plan
to the Minister or Ministers concerned, who, after making any changes which
may be necessary, in consultation with the Minister for Research Policy,
confirm the plan and bring it to the attention of the Minister for Research
Policy whose task is then to assemble all the sector plans into a single
coherent whole, the Research Plan.

The Resarch Plan, which will eventually also cover university research (the
first as well as the second flow of funds), will be presented to Parliament
by the Minister for Research Policy. We still have a long way to go before
this situation is achieved, and it is anyway a development which cannot be
forced. In the matter of the Sector Councils, I can tell you that another step
has been taken: in order to give direction to the development of the principles
set out in the Memorandum on Science Policy for the Sector Councils, a con-
sultative document on the Sector Councils has been prepared and will probably
be released for publication today. The document will be made widely available,
so that all those concerned can be involved in consideration of the sectors
for which Sector Councils should be established, the practical function of
the Councils and the way in which they should be set up. I shall not dwell
at lenghth on the consultative document, but I should like to touchon a number
of points of interest or importance to you.

The division into sectors

The consultative document proposes some fifteen sectors, such as energy,
agriculture and nature conservancy, industrial technology, public health
and environmental protection; there would also be a sector for development-
related research. The division is based on the idea that the Sector Councils
will function most effectively if they are easily identifiable for everyone
concerned and therefore links in as closely as possible with existing
structures, i.e. those of the researchers, the users and the government. The
beneficial consequence for research of such an approach is that most
research institutions will operate under only one Sector Council, and their
research programmes will be dealt with as one whole in one Sector Council.

An over-rigid application of the principle that links should be sought with existing structures would naturally lead to a rather static situation, since the structures are not always up to date. Since good organisation is forward looking, when we designate sectors we should try to anticipate - to the best of our ability - future developments in society.

Whatever sector division is eventually adopted, it is most important that it should be a flexible one; there can be no rigid and definitive division. To put it another way, the Sector Council system should be as closely geared as possible to current needs, but it should also be capable of adapting to suit future developments. Clearly, it will be the task primarily of the Minister for Research Policy and his staff to ensure that such adaption is done. Mention has already been made of a possible Sector Council for development-related research; at some time in the future it might be necessary to think more in terms of a Sector Council for research in the field of international relations (peace and security), of which development cooperation would form an important part.

In the case of a Sector Council for development-related research it would clearly be diffucult to find links with existing structures; only the Government can offer an organisational framework in this field. The research effort is scattered, with research being undertaken in institutions whose primary aims and interests lie within the Dutch situation. The research falls under such sector headings as health, agriculture, technology and energy. It is, however, true that research institutions are increasingly making capacity available for development-related research. Clearly, then, it is necessary to undertake integrated planning and coordination in this field so that a balanced mix of priorities may be established, with research taking place where the most suitable facilities are available and any shortcomings in capacity being identified. In the sphere of appropriate technologies a praiseworthy start has already been made by the Working party which in April 1975 presented its report entitled "Appropriate technologies: a first look, a working pro-gramme" to Mr Pronk. The greatest problem is the involvement of the users, since in this case they are the developing countries themselves. The report of the NUFFIC working party on research assistance which was a subject of dis-cussion at the NUFFIC Conference in December 1975, illuminated the problems involved. As I understand it, the solutions proposed by the NUFFIC working party were covered to a significant extent in the consultative document of which I have already spoken. I do not, however, believe that the representa-tion in advance of the developing countries is impossible; experts attached to the embassies of developing countries in the Netherlands or neighbouring states could be involved in the work of the Sector Councils, for example.

The Sector Councils in operation

In discussing the way in which the Sector Councils will operate, I should first like to point to the rather special position which the Council for development-related research will occupy. There must clearly be close coordi-nation between the work of this Council and those involved with agriculture, industrial technology, building and housing, and so on. Few, if any, non-university research institutions will come wholly into the ambit of this Sector Council. The programmes of institutions involved in development-related research will for the most part also come under the competence of other Sector Councils. All this will require extensive consultation. The Sector Council for development-related research will also have a most important role to play in making recommendations concerning the allocation

of the research funds which are at the disposal of the Minister for Development Cooperation. In the proposals of the NUFFIC working party interesting views are expressed on the various research categories to be considered; the report could, however, give the impression that the Sector Councils will have to concern themselves with project appraisal. To the extent that this misunderstanding exists (not everyone understands the word "project" in the same way), I should like to dispel it: the Sector Councils will be concerned with overall planning, and will therefore not be involved in appraising individual projects. Project appraisal must take place at a lower level.

The most important part of the Sector Council's work will be planning, always assuming that an affirmative answer can be given to the question asked by Harvey Brooks in 1968 "Can Science Be Planned?" (in Problems of Science Policy, OECD). It seems to me that it can, if our ambitions are not too far-reaching and if we content ourselves, initially at least, with fairly modest plans. That it can seems also to be confirmed in the approaches advocated in the report of the NUFFIC working party on research assistance and in the report on appropriate technologies. Research workers and research institutions will have an important role as initiators in the planning process. The long-term plans of research institutions and groups, if well prepared, will anticipate the research needs of other partners represented on the Sector Council and thus form the basis of the plans which the Council will draw up. University research groups too will, in my opinion, be able to make an important contribution to planning (and - and this is of course more important still - to making the plans a reality). As I have already pointed out, the conclusion that some have drawn from the Memorandum on Science Policy that there is to be a strict division between university and non-university research is not correct.

In order that the contribution from the world of university research should be positive and coherent, it seems to me necessary that there should be a national organisation of research scientists attached to universities. I do not wish to go into the subject of how this might best be structured, but I think it not inconceivable that university research will be able to answer this new challenge using the framework of existing or future study groups. Initial approaches could be developed within the framework of NUFFIC or through WOTRO (Wetenschappelijk Onderzoek van de Tropen, Foundation for the Advancement of Tropical Research).

I do not wish to arouse the expectation with what I have just said that university research groups will be directly represented on the Sector Councils. It is very possible to take part in the work of a Sector Council without actually having a seat on it. We must strive to limit the size of the Sector Councils and their subordinate bodies, and this implies strict selectivity in the matter of who had and who has not a right to representation.

To conclude my perhaps incomplete survey of the operation of the Sector Councils, I should like to say something about the body which will be responsible for all the preparatory work, the Sector Council secretariat. I concur with the warning words uttered at the NUFFIC conference concerning the composition of the secretariat of a Sector Council for development-related research.Although I find much in favour of NUFFIC's offer to provide the secretariat, the Foundation must guard against any confusion of functions - that of coordination between institutions of higher education and that of providing a secretariat for the tripartite consultative structure of a Sector Council.

Setting up the Sector Council system

I should now like to go on to talk about the setting up of the Sector
Councils. Care must be taken to ensure that the system constructed functions
effectively. A first requirement is that we must not set to work too
hastily: a gradual and controlled process of development, with the
purpose of the exercise constantly borne in mind, is what is needed.
The Sector Councils are not an aim in themselves; they will be re-
quired to make a demonstrable contribution to the gearing of research
to social needs, and to the promotion of the quality and effectiveness
of scientific research. Two things follow:

1. The establishment of a Sector Council must be preceded by a thorough-
   going analysis of the processes of consultation, planning and
   coordination already in operation in its sector. In practice this will
   mean the listing of all existing consultative and advisory committees
   in the sector and an examination of the possible ways in which their work
   can be incorporated into that of a Sector Council. It is worth em-
   phasising here that what is envisaged is a new division of responsibilities
   as between the advisory bodies operating in a particular sector, and this
   may involve certain committees being wound up. What scientific research
   certainly does not need is over-organisation!

   The speed with which a Sector Council can be set up will be determined
   by the state of development of existing organisations in the field;
   the greater the experience already gained, the sounder will be the
   information which will guide us in setting up the Council. In present
   company, the question is naturally how quickly a Sector Council for
   development-related research can be set up. Well, although I am fully
   aware of the urgency of the need for coodination in this area of research,
   I must warn against haste. I would align myself with the recommendation
   made in the consultative document on Sector Councils that the preparatory
   work should be undertaken by a preparatory committee, which would draw up
   the list that I mentioned, make proposals as to the manner in which all
   parties involved could be represented on the Council, survey the areas
   of greatest need and make preparations for the establishment of a
   secretariat. With reference to this last point, there is in my opinion
   little sense in establishing a Sector Council before one has at one's
   disposal a properly staffed secretariat.

2. Even when the Sector Councils are operating, developments will have to be
   followed closely. I spoke of the need for flexibility à propos
   division into sectors, whose usefulness must constantly be examined with
   adjustments being made if necessary; such flexibility is also needed
   in the operation of the Sector Councils; they must be able to respond
   to particular situations and to new developments in research, in
   policy, in society. A periodic assessment of the effectiveness of the
   Sector Councils - seperately and collectively - will have to be under-
   taken.

Appropriate technologies

Although this is not a field in which I can claim any great expertise, I
should nonetheless like to look at certain aspects of development-related
technological research. If we were to follow an international recommendation
and accept as desirable that 5% of the total research effort in the

Netherlands should be development-related, then certain qustions arise
which I would like to discuss.

First, this Congress is dealing with appropriate technologies, and the
obvious question comes up: does the emphasis on "appropriate" technolo-
gies imply that all development-related research must in future con-
centrate on low and intermediate technology projects? Surely not. One
cannot - we cannot - declare high technology taboo for the developing
countries, though at every transfer of technology we must ask ourselves
the vital question: is it suitable? It may well be possible to cite cases
of the importance of this question as to suitability being underestimated;
certainly, all project aid must be checked for its appropriateness to
the situation of the receivers.

Who does what?

Second, there is the important question of who - the research institutions,
university or non-university - does what. Researchers attached to
universities will clearly lay stress on the more fundamental or strategic
aspects, i.e. on the formulation of the theoretical framework. Non-
university institutions will concern themselves chiefly with the more
applied or tactical aspects, though here too problems of a fundamental
nature will require tackling.

The heading "non-university research" will also cover work done by commercial
enterprises. I see that private industry in the Netherlands understands
the importance of intermediate technology, witness the Philips testing
section in Utrecht where radio sets etc. are assembled under conditions
simulating those in the developing countries.

The TNO (Central Organisation for Applied Scientific Research in the
Netherlands), and more particularly the TNO Nijverheidsorganisatie
(Organisation for Industrial Research) also play an important role. The
Industrial Research Organisation was set up in the nineteen thirties to
modernise undustrial activities in the Netherlands and to adapt them
to changed circumstances. This process of adaptation is a continuous
one, given that the obstacles to be overcome and the factors which limit
our work (environmental problems, the energy question and so on) them-
selves constantly change.

Although the work of the TNO is geared primarily to the needs of Western
society, many of the by-products of industrial research (and no kind
of pejorative association here attaches to the word "by-product") are
in fact of great value to the developing countries. I am thinking for
example of the technology of the treatment and processing of natural
fibres, work study in industrial production, baking technology and the
use of flours made from grains other than wheat, and so on. Any further
stimulation of development-related research can only increase the
numbers of useful discoveries and inventions.

Given our national attitude towards development cooperation with the
Third World, based not just on sympathy with the lot of the poorest
but on a sense of justice in the matter of the distribution of wealth
and on our involvement through the centuries with other countries, it is
perhaps surprising that we did not adopt this new approach much sooner.
It is clear that the transfer of technology is not the same as opening

a library of technical handbooks. Interested persons may amass knowledge from them, and that knowledge will probably contain all the information necessary for its successful application; but guidance from experts is needed - the personal touch. It is almost always necessary to modify newly introduced techniques in order to get them accepted, and this requires an army of technicians from the developed countries - especially if the Third world is to have any chance of achieving the target set so boldly - of foolhardily - in Lima for the year 2000, that of raising the developing countries' share in world industrial production from 7% (1975) to 25%.

I should also like to express the hope that the current enthusiasm for conducting small-scale projects, under the aegis of TOOL, will continue. That vital spark of idealism which illuminates this enthusias must be kept alight. It seems to me that there are in higher education a number of ways in which this idealism can be fostered, for example by widening the choice of degree subjects. "Appropriate technology" is in no way a synonym of "low level science"; on the contrary, the greater number of variables involved will intensify the scientific challenge to the students, as compared with more conventional research work.

Staff policy

Third comes the rather difficult question of the employment position of researchers who in their training and experience have specialised in development-related research. This question has two main aspects: what will be the development of employment opportunities with universities, in developing countries, with bodies involved in technical aid projects, for example in the field of development-related research? and what are the prospects for the researchers involved after a particular project has been completed? The provisions which may be made in this area will require careful consideration by the government, research institutions and others.

Conclusion

In conclusion I should like to stress that "appropriate technology" is not merely a heading under which various channels for the transfer of technology can be classified; its meaning goes much further than this. What is implied is the matching of our efforts and expertise to the possibilities and requirements of the Third World.

Panel discussion

There is some anxiety about the B of Mr. Schumacher's A (administrators) B (business), C (communicators). This B will want to make money once the developing countries open up as a new market.

Mr. Schumacher
There is no ground for that anxiety, for it would be rather a good thing to involve B, because that would keep us going. We must forever form a kind of counterweight and steer it into the right channels. Don't forget that you can't milk a cow when you are afraid of it. Moreover, we shouldn't specifically think of a factory when talking about B, but more of the knowledge and the talents hidden away in there. These must be stimulated to search for new things with A and C in the field of appropriate techno-logy.

Question:
It has been stated that there will have to be innovation in order to get a development. And one of getting there would be via the promotion of appropiate technology, but won't the need for a research in the fields of religion and culture be neglected in that way?

Mr. Ariyaratne:

Development is more than just an economic process. What we need is a total approach. We must get rid of the dependance of people. There must be more freedom to work and think as each person sees fit, provided this doesn't interfere with other people. This will make people more inventive. Science and know-how must come within reach of the common man. Everybody must be able to apply these two.

I'll give an example of how it should not be:
A chicken expert visits a farm and asks the farmer's wife whether she has any problems with her chickens. The woman denies this and the expert is very disappointed. After some pressing there seems to be a problem after all; how can she distinguish the chickens from the cocks? This question amuses the expert and his answer is simply; the cocks eat male worms and the chickens female ones. Oh, but how can she then distinguish the worms? That, says the chicken expert, you'll have to ask the wormexpert.

Question:
Has small-scale industry not the disadvantage of bad quality and high prices?

Mr. Mramba and Mr. de Wilde
That is something very relative, it just depends on what you compare it with. Where you possess absolutely nothing, any method can obtain the things you want is cheap and good. But we often go about it the wrong way. In order to get good methods for small-scale industries we mustn't cut the large-scale

31

industry in two, we must find adapted methods. There are many methods e.g. to make adhesives like cement, but many of these methods have been forgotten and they have to be brought back, (e.g. Mr. Schumacher's "law of the disappearing middle").

Small-scale industry is successful in many places (sugar in India) although it is sometimes outdone by multi-nationals (Kenya). But where the small-scale industry is unable to compete, then it is not suitable, for one of the conditions is that it must become part of the people.

Question:
Isn't it true that very often the whole system has to change, instead of just the approach to industry?

Mr. Mramba:
That is certainly necessary. Everybody must be able to benefit from the innovations. That mistakes will be made is inevitable, as long as they aren't made intentionally to favour an elite. In order to avoid appropriate technology from becoming like the old European technology (labour intensive and with good development prospects for those days!) and hence only putting back the people in the developing countries, certain conditions have to be met. Note that in some countries, appropriate technology is seen as a threat - why appropriate technology for us and not for the western world -, it is seen as something that is forced on them and not as a direct contribution to their development. The conditions are:
1. The B must be checked.
2. The Government will have to take on the task of C.
3. Everyone will have to give his/her support. This calls for an integral approach such as the ABC of ITDG.
   At ITDG as well, the social points are more and more drawn in, such as co-operative work and training for management in the small-scale industry. It would be useful to turn B into an S (state) B.

Question:
Can this state be kept permanent, for this is essential for a well-balanced development.

Answer:
The only thing we can do is hope, work hard, keep our faith and learn from mistakes.

Question:
Is it possible to fit in appropriate technology in the learning-process here in the Netherlands?

Mr. Spiegel:
Possible but difficult. In principle the educational system is democratic and tolerant, but that a student who wants to introduce new things can get into trouble is clear from the past. We shall all have to try and prevent this.

Question:
How can a democratic movement be maintained in an undemocratic system?

Mr. Ariyaratne:
Real democracy doesn't exist. But it is true that the Sarvodaya Movement

is having a difficult time. We will keep on fighting for democracy and we mustn't let ourselves get discouraged. We advocate the spiritual awakening and besides, the movement has gradually become so big that it is very difficult to fight her.

Question:
What is the relationship of ITDG with the English government and the trade-unions?

Lord Oram:
With the Government, ITDG has the following connections:
1. A group in Leicester (part of ITDG) is partly financed by the government.
2. In the search for teams of advisors for the work, the government often acts as intermediary.
3. Several groups have members who also hold functions with the government and thus form unofficial connections.

With the trade unions there is not much contact, because ITDG concentrates primarily on the developing countries and the trade unions are too busy with their own problems. The general interest in England is growing however, especially as a result of the oil crisis.

Question:
What can we do in the Netherlands?

Mr. Ariyaratne:
We must all work together to solve these problems.

Mr. Mramba:
You will have to go to the third world to see and learn how much knowledge of appropriate technology exists there. Perhaps introduce improvements in the field of tools and equipments in co-operation with the people. The local efforts could be supplemented. Exploitation of the developing countries must be avoided and the present exploitation should not be fostered but should be put a halt to as soon as possible.

Responses and responsibilities

Drs J Pronk

(translation)

That my speech consists of only a brief impression is because I haven't
been able to attend all of the congress, but only the greater part of
the second day. Therefore you shouldn't regard my observations as a story,
which I was asked to tell on the first day of this congress. I refused
to do that because I have so little to tell you. I actually prefer to
come here to learn something myself. You should view my observations
in the same light as the observations that were made before, as a reaction
to the things I have learned here.

On the one hand, appropriate -

Reactions I could give as an economist. As an economist, I am naturally
interested in every attempt at a better application of materials that
are scarce, wherever it may be, and that is what you are involved in.
When giving my reactions as a developer I would say that the work done
in this field of appropriate technology is important, though not because
it is new, for I think, and this isn't only a theory, for I can also
speak from the experience I have gained in my travels abroad, that the
extent to which appropriate technology is used by people in the Third
World is underestimated here. I believe that farmers and labourers in
developing countries when choosing from available techniques, base their
choice on an age-long experience and that this choice is gradually made
during a learning process which is experience-oriented and though it may
perhaps not always have been made with an entirely conscious conside-
ration, yet it is an optimum consideration of the objective, viz. :
the greatest possible adaption to the social, the natural and the economic
environment in which they live.

- and appropriate on the other -

Perhaps it is the way in which appropriate technology is already being
selected at the base in the developing countries which is underestimated.
Of course the issue is to bring about a number of changes and improvements
in the choice of production techniques which don't make the existing
appropriate technology inappropriate, but make it better adapted to the
changing social, economic and, of course also, environmental conditions
in which the farmers and labourers are operating.

- by working at the base -

As a developer I think this work is, moreover, important because it pre-
eminently deals with contacts at the base. The development co-operation
policy, such as it is pursued by us, even when it is, as far as the objective
is concerned - and how can it be otherwise? - still mainly a government
policy, tries as much as possible to promote activities at the base via
governments or around governm nts. For that reson I am interested in every
contribution towards extending and intensifying those activities at the

base, and these contributions are being made by you and also by other groups.

As a developer I am the more especially interested since I have come to the conclusion that the problems we are struggling with here in the Netherlands, in Western Europe,in the United States are not really all that different from the problems the people in Africa, Asia and Latin-America are struggling with. They are actually the same problems, they only exist on different economic and technological levels.

- and learning to include ourselves.

The problems are the same, but the choices are different. We have always automatically looked for the solution of our problems in a certain direction, just as the developing countries in the past have automatically looked for the solution of their problems in a,for them,self-evident direction. But in the developing countries, question marks were placed behind the self-evidence of certain solutions and I have noticed that in this matter of question marks we would always lag behind the developing countries and that we have yet a lot to learn from them.

I believe, moreover, and in that respect I am somewhat of a culture-pessimist, that we should start learning right away, otherwise we and our Western Society will be rapidly going down hill, for it is precisely where the dedication of people is concerned and their people-oriented policies that the developing countries have such a lot to teach us.

But more important than a reaction as economist or developer is, of course, a reaction on policy, for that is what you are interested in. When I briefly touch upon the problem of choices you have been faced with in this discussion-process of to-day, which isn't only adapted to the group, but also to the individual, then I can say that I am pleased with your choice of a multi-disciplinary approach. Yet this choice is also a reflection on you. I have the impression and you may of course correct me, if I'm wrong, for I don't know all that much about TOOL, although I do regularly meet with Mr. de Wilde, that TOOL operates mainly within the field of the sciences and that the field of arts, economics, non-western sociology, cultural antropology, is sadly neglected, while this field is terribly important for this kind of work. And when I say that this choice reflects on you, I think this is also true for the policy decision you have taken, though it is taken with a good spreading of preferences, whether the policy should be directed exclusively at developing countries or at Western societies a lso. I am convinced that the policy should also include Western countries. But this can only be obvious after I have given you my reacion as a developer. Since all these problems are inter related, the orientation towards western countries will have to take place in a well-balanced way, just as balanced as the spreading of preferences indicated in the policy decision.

Political choices, and policy channels

With regard to the question on the taking up of a political position, it hasn't been clearly indicated yet, and, as has been said before, it depends on the clearness or the obscurity of the question. I am convinced that taking up a political position is a pre-condition, wherever there is a decision to be taken. In our development policy, such as it is pursued by us, we are, from Government to Government, gradually working more and more, although for many Dutch people not enough yet, on the basis of a

number of clearly defined political criteria. We work in this country, but not in that one, we work with this government, but not with that one. This is not because there is a preference for a certain political system, (of course one has preferences but these can't be imposed) but because we think that through certain governments it is possible and through certain governments it is not possible to reach the people at the base. This gradual politicalization takes place against the background of the wish that, apart from this government to government policy, the contacts of groups working at the base in the Netherlands with groups working at the base in the developing countries will be greatly extended.

These contacts can be via private organisations, via universities, via churches, you name them. For it is precisely because these groups are working at the base that they are better able to ignore the political system, something which a government cannot do. And I rather hope that churches, trade unions, and universities will strike up more contacts with countries that are ruled by governments the Dutch government can't really co-operate with, so that the Dutch government will be able to formulate her own political criteria more clearly than otherwise would be the case. And it also means that the people, in those countries that are ruled by governments not really interested in the people themselves, won't be left out in the cold.

A few small points: Because I don't work within a TOOL group, my knowledge of this question doesn't reach very far, yet I can see a number of problems arising with regard to the relation between the centre and your groups at the base. But this is for you to consider; in no way could I advise on this. There are however a few conclusions I can draw. The first conclusion I can draw from your tentative choice is that I may take my time considering the request for a grant which was put to us by the TOOL-office.

I have noticed that you are not very interested in centralisation at the top. Well, the request for a grant for this year is four times as high as last year's request for the centre. We are quite honestly a little hesitant on this point, as you can probably well imagine. It doesn't quite fit in with our policy. We don't want to finance all sorts of institutions which we then can never get rid of anymore. We want to finance activities on a project basis, and I understand that you hold the same views. We will, together with TOOL, come to a responsible and reasonable decision, to which I must add that the government has many more means other than financial at her disposal to be of aid to you. When you lay emphasis on the groups, when you sometimes have difficulties with returning fieldworkers, the enlisting of questions and projects, the establishing of contacts, in those fields the government could, without great financial consequences, solve a number of problems and I hope that the discussion with TOOL on these possibilities for governmental support will become as important as the discussion on the grant itself. From the policy I draw the conclusion that it is important to integrate the work of the groups with the institutions you are involved with and that you will have to work together with new groups.

I have been listening carefully and I would like to say that, although I understand your apprehension - and from my own political convictions I understand this very well - to work together with private enterprises, yet I believe that it has to be done. For I don't think one can continue with this work and at the same time say: "Let's wash our hands of this, for those businesses are dirty and we'll build our own enterprises by the side of them".

I believe that when one criticizes the activities of the business world, amongst other things their choice of technology, their implant of techno- logy in developing countries, their decisions regarding the distribution of the fruits of the economic process they help to speed up; when one makes critical remarks, then this also reflects on the person who makes them. Then this criticism should be translated into a challenge to the business, to try and set up a different form of management together with them. For otherwise, it would only amount to keeping one's own hands clean, on a very small scale, which won't do the developing countries any good at all.

More functional research is needed

In conclusion I'd like to make two more remarks.

This government is trying to internationalize a little more, which is the reason for our activities within the ILO, although in that respect we are not forerunners, England, for example, is doing much more, but we came a little late and it's also because we are so involved with the work done at the base, here in the Netherlands. But I hope that the ILO Conference, on the Generation and division of employment, in Genève, this coming May, will be a stimulus for an internationalization of the work. As far as the government's standpoints are concerned, we are fully prepared to give our support and to bear the financial consequences. We would also like to in- clude this in the framework of research policy. You'll probably know that we are redirecting research policy; our policy will be that research must be functional, it must be directly beneficial to the people at the base. We've mentioned a few examples already and also the work you're doing is an excellent example. Therefore, we are quite willing to give our support in the framework of the research policy and on a projectbasis.

The next step is evaluation

My second remark is that I've missed one question, you haven't asked it, perhaps it was asked in the groups but if so, it has now sunk away again. The question is: how will you organise evaluation?

How can you be sure that what you are doing is really useful and that it will strike the people you're doing it for, in the developing countries themselves, as useful. I am surprised that this issue hasn't been raised here and I don't know why that is. But if we, in the government, can help at all with the evaluation, you have only to ask us.

Of course you must decide first whether you think this evaluation is really important.

Well I hope you will do, because the work you're doing can't take place just here in the Netherlands. No matter how the contacts with the people in the developing countries are organised, they are absolutely necessary for the work to be really effective, for only then the work will be aimed at the real needs, the real demands and they're also important for the ethics of the work.

That was my final, rather critical remark; for the rest, nothing but com- pliments. And these compliments I'm paying you are at the same time a challenge to myself and the policy, for it means that they will have to be integrated consistently into the policy.   I thank you for having invited me here today. I have really learned something. I hope that we will, in the coming period, together take another step forward in this vitally important field.

In February 1976, the TOOL Foundation organised
a national Congress on Socially Appropriate Technology
at the Catholic University of Nijmegen, the Netherlands.

The central purpose of the conference was to act as a
forum for several hundred volunteer members of the nine
groups connected to TOOL to shape the mid-term future
for the foundation, then less than eighteen months old.

As a backdrop to organisational affairs, the first half
of the Congress was devoted to the presentation of a
number of development scenarios which helped to under-
line the special role which TOOL was developing: the
integration of socially appropriate technology within
educational institutions and development programmes.

The significance of the Congress is demonstrated not
only by the tremendous outside interest it aroused, nor
by the stimulus it gave for the foundation's policy
development, but also by the willingness of a number of
key speakers to participate. The texts provide the
basis for this publication and are a rare blend of
official and non-official attitudes, ranging from the
question of research policy and the approach of the
government – the major foundation funder – to the work
and the concepts of those directly concerned with local
level development.

Presented at a time when the role of technology had
finally taken a central position in the developmental
debate, the papers, above all, are a witness to the
underlying desire of the foundation and the congress
participants to achieve the implementation of a
socially appropriate technology.