Smallpox Zero in Africa

Since the days of the Romans, Africa has always had a story to tell. But too often the tidings from that vast continent have been grim—wars and rumours of wars, or reports of drought, famine, suffering and death. This month, however, brings confirmation of victory by Africa in a different kind of battle, the battle for freedom from the dreaded disease of smallpox.

That indeed is a new and promising Uhuru, won by the nations of Africa with WHO assistance and generous international support. The WHO intensified world campaign against smallpox was launched in Africa in 1967. The world’s last case of endemic smallpox was recorded on 26 October 1977 in the Horn of Africa. The patient, 23-year-old Ali Maow Maalin survived. Instead it was smallpox as a disease that has vanished from the earth. Articles and pictures begin on page 14.

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An International Children's Centre team checks on vaccinations deep in the North African hinterland. The ICC marks its 30th anniversary this month. (Photo WHO/ICC)

And at this nursing school in a Middle Eastern country, the instructor—himself a former "graduate" of the ICC—is putting his pupils to work on the growth of the child and on the value of measles vaccinations. He uses as his text an issue of the ICC magazine "Children in the Tropics" and some of the technical reviews published by the Centre's Information Department.

These are just a few examples of the activities of the International Children's Centre, which is one of WHO's collaborating centres in the field of maternal and child health, and which celebrates—in this International Year of the Child—its 30th anniversary.

Children of the Third World

Every durable achievement is born from the encounter, at the right time and in the right circumstances, between an idea and an individual. In 1949, UNICEF was in the process of extending its mandate to reach all the children of the world. Its Executive Board, whose members included Professor Robert Debré, had newly inscribed among its priorities the training of staff of all categories for work with children of the Third World. It looked forward next to creating a certain number of centres to serve as diffusion points for this international teaching in the service of young people.

Among the governments who were approached, only that of France—at the
instigation of Robert Debré—took the
necessary steps to follow through this
project in a concrete form: and thus the
ICC was born. Its original, rather hybrid
statute means that it is at the same time
an international organization (dependent
on and still partly subsidized by UNICEF)
and a governmental body, since the
greater part of its budget now comes
from the Direction of International Or-
ganizations at the Quai d’Orsay—the
French Ministry of Foreign Affairs.
From the start, the ICC has always
worked closely with WHO, FAO, UNESCO
and other specialized international agen-
cies in carrying out its teaching, applied
research and information activities.
Moreover the leading organizations of
the United Nations family are statutorily
required to form the Technical Consulta-
tive Committee of the Centre, and thus
contribute directly to the orientation of
its programmes.
Three major ideas comprise the doc-
trine of the International Children's Cen-
tre and underlie all its activities:
— the continuity of human development
which starts at conception and lasts
for a lifetime—the periods of childhood
and adolescence being particularly vul-
nerable, dependent as they are on a
whole series of biological, psychological,
and social and economic factors which leave
their imprint on every individual's per-
sonality;
— the need for a global approach to the
problems of the child and the adoles-
cent, calling for coordination between
the various sectoral activities, whether
health, educational or social, whose
concern is the welfare and the protection
of the family;
— the high priority that must be given
to promoting family welfare and com-
community development in national eco-
onomic and social development planning,
particularly in the developing countries.

ICC's Programmes

It is in this spirit that ICC has de-
veloped, through its different services, its
programmes of training, applied
research and information.
Training occupies a privileged place in
the work of the ICC. Since its foundation
the Centre has organized over 400 teach-
ing activities, from which more than
20,000 participants from 130 different
countries have benefited. These courses,
discussion groups or seminars, organized
in many parts of the world, have revolv-
ed around four principal themes:
— family and community health: with such sub-headings as the organizing
of community health services, primary
health care, and health and family plan-
ning;
— problems specific to childhood and
adolescence, such as the needs of the
small child, the child in its first year at
primary school, the health of the school-
child and of the adolescent, accident
prevention, or the children of migrants;
— diet, nutrition and growth: agricul-
tural production, nutrition and health,
breastfeeding;
— the methodology of teaching and
apprenticeship: training in the preven-
tive and social aspects of pediatrics, obstes-
ctrics or family health.

Since the participants are most often
francophone, instruction is generally
given in the French language, but about
one in four of the courses are given in
English or Spanish. The participants in-
clude a variety of professions: doctors,
health personnel or social workers,
teachers at all levels, magistrates, archi-
tects, agronomists, planners, administra-
tors and so forth. What they have in
common is a specific interest in the prob-
lems of the child, and as a rule they are
chosen by the appropriate ministry
depending on the responsibilities they
will have in teaching and/or administra-
tion, and in line with the profile estab-
lished as the different sessions are being
prepared.
The teaching methods employed aim
above all at bringing about a change in
attitudes and a greater awareness of the
problems of childhood in a dimension
that is at the same time dynamic, global
and integrated, while appealing to dif-
derent disciplines. The evaluation that is
made at the end of each session serves to
define more accurately the objectives and
modalities of the teaching methods so
they can be adapted better to the needs of
countries and participants.

The studies and applied research car-
rried out or coordinated by the ICC serve
to enrich and renew its teaching message.
Sometimes they concern subjects of in-
ternational interest, such as the growth
and development of the normal child,
breastfeeding, the problems of children
of migrant workers or the prevention of
childhood accidents; sometimes they
stem from ICC's participation in national
projects: concerted action for health in
rural areas of Niger, an integrated de-
velopment project in Mali or, more re-
cently, the establishment of play centres
for pre-school-age youngsters in Benin.
Several of these projects receive some tech-
ical and/or financial assistance from
national or international organizations.

But so far as WHO is concerned, it is
without a doubt ICC's Epidemiological
Pilot Station which makes the Centre a
particularly valued collaborator, by vir-
tue of its methodical research into im-
munization in infancy and early child-
hood. These studies have not only led to
the improvement of many vaccines but
have also resulted in the training of a
large number of technicians, thus con-
tributing to the success of several national
campaigns. It has been possible to study
the quality of different vaccines and the
duration of protection afforded by them.

The results enable us now to adapt im-
munization schedules not simply to the
epidemiological situation of a given
country but also to the conditions of
delivery of health care. The next prob-
lem, in the developing countries, is to en-
sure the availability of primary health
care services which include vaccinations
as an integral part of their activities. It is
essential to ensure the participation of the
whole community, to keep its mem-
bers informed and to educate them. With
a view to training staff, the Pilot Station
also prepares scientific articles, technical
notes, manuals and periodically a bibliographical bulletin summarizing the most recent references on immunization.

The key to the world of today is information. The ICC has always given much importance and attention to this aspect. It has a documentation service comprising some 9,000 volumes as well as 800 collections of periodicals dealing with the problems of childhood, adolescence, motherhood and the family. The principal tasks of the service are to collect this valuable material, index, abstract and store it, and then to disseminate it as required to meet the specific needs of a wide variety of users. The bibliographical card-index, containing over three million references, is widely used to respond to the many requests for bibliographical references received from all over the world.

In addition, the department is setting up a network of associated documentation centres in a number of developing countries. These centres are conceived as relay points for the dissemination of references and also serve as sources of information on the real needs of potential users in the country or area where they are established.

The ICC regularly publishes two revues. “Children in the Tropics” is aimed first and foremost at staff working in the health, social and educational fields in direct contact with the population, and at all those concerned with development. Its six annual issues—with a circulation of 8,000 copies in French and 6,000 in English—are distributed in 130 countries and territories, particularly in the Third World. The “Courrier” is an essentially bibliographical journal which
Youngsters at play in West Africa. One of ICC's most recent projects is to set up play centres for pre-school-age children in Benin. (Photo WHO/P. Pittet)

each year publishes, in French and English, several thousand abstracts of articles and books dealing with the whole range of health, social and educational problems of childhood, adolescence and the family. Increasingly orientated towards the developing countries, it appears six times a year, and its 3,000 copies reach 110 countries and territories.

Other publications include reports and books resulting from research or seminars organized by the Centre, bibliographical bulletins prepared jointly by the Department of Information and ICC’s technical services which are sent to workers dealing with specific problems, and technical reviews which try to respond to the information requirements of various professional groups.

These then are the products over the years—modest and yet perhaps of real value—that have emerged from the International Children’s Centre. These tasks of three decades have only been made possible by the firm links that have been forged with large numbers of governments, ministries and organizations of all kinds, sharing in common a real care for mankind and its development. Many and close are ICC’s ties with the international bodies—ties which guarantee that the work and services of the International Children’s Centre closely follow the principles of technical cooperation between countries, and more particularly between developing countries.
CHILD-to-child

The International Year of the Child sees the unfolding of a planned programme through which youngsters themselves lend support to today's new priorities in health and education

by Mary P. Johnston

It is estimated by UNICEF that a quarter of the world's population—350,000,000 children—are beyond the reach of even the minimum of essential services in the fields of health, nutrition and education, and that for many of the rest the existing services are likely to be inadequate and inappropriate. And of these children it is the children under five who suffer most. In many countries more than half the deaths are in this age group.

These problems have not escaped the attention of international agencies and many government and voluntary agencies. However, despite their efforts to tackle them over the years, children's problems still remain a key concern of the world. Hence the decision of the General Assembly of the United Nations to declare 1979 the International Year of the Child, when world attention is being focussed on young people with the aim of stimulating innovative programmes which will more effectively meet children's needs.

This challenge prompted action from concerned members of the Tropical Child Health Unit of the Institute of Child Health, and of the Department of Education in Developing Countries, both in the University of London. They were convinced that children themselves could assume a significant role in helping each other to grow up healthier, and to make their home and community a healthier and more stimulating place to live in. This conviction arose from the observation that it is common in many countries for big brothers and sisters to spend time each day with their younger siblings — playing with them, feeding and minding them. They help to meet the young child's need for adequate protection, health care, stimulation and socialization. The London group felt that it was feasible to build up a programme around these activities; a CHILD-to-child programme in which children would be the key actors and which would support the new priorities in both health and education which are gradually being developed in many countries.

Clearly the first step was to collect ideas and opinions from around the world on which to base the programme. The forum for this was a Working Party which was held in London in April last year. Twenty experts in education or child health from 13 different countries of Africa, Asia and Latin America met to discuss and plan CHILD-to-child activities, activities in which older children could give better health care, provide more stimulation and help increase the social consciousness of their younger brothers and sisters.

After two weeks the Working Party was joined by a further 18 educationists and medical or paramedical personnel from 13 countries, and the expanded group met together for another five days in Fittleworth, Sussex. From the discussions in London and Fittleworth there emerged a clearly defined framework, together with a range of individual prototype projects which, although unlikely to be appropriate for every community or every country, could certainly provide ideas for modification in the light of local needs or serve as examples for translation into different geographical and social contexts. It is hoped that in many countries around the world local programmes will be set up as part of the IYC activities, and will be continued after the year is ended, eventually being absorbed into school curricula and health education programmes.

Many of the CHILD-to-child activities have been presented in Activity Sheets. Each of these sheets outlines a group of activities for use by schoolteachers, health workers, youth leaders
and others. Most of the activities are best suited for primary school children, who were judged the most accessible of all children for the dissemination of new ideas in most countries. The activities are grouped under five headings: Eating well, Children as health workers, Providing a healthy and safe environment, Children growing up, and Stimulating younger children.

Eating well

In view of the crucial importance of nutritious foods, particularly for children under-five, a number of activities have been suggested in which older children, who are often responsible for feeding their younger brothers and sisters, can also help to improve their diet. An awareness of poor nutrition is the first step in promoting improved care of malnourished children. School children can easily be taught how to use the "Shakir strip", a simple device which measures the diameter of the upper arm to check the normal growth of young children. After measuring youngsters in the community they can report their findings to teachers and other key people to stimulate community action.

Older children can also be taught the need to give food with enough energy to younger children and work out ways in which they could do this. By knowing which foods are both nutritious and cheap, according to season, even poor families can afford to eat better.

Children as health workers

Since older children spend so much time with their younger brothers and sisters, they can do much to prevent them from becoming ill and can treat them when they are. For example, severe diarrhoea is very common and children under five years frequently die from the resultant dehydration. Children in several countries are already being taught how to prepare and administer the right solution of salt, sugar and water to prevent dehydration.

Older children easily learn how to recognize certain warning signs of common illnesses, and when and how to seek help. They can help reduce or eliminate skin conditions too if they understand the relationship between poor hygiene and such conditions as skin sepsis, ringworm and lice. They can learn and pass on to younger children how to take good care of their teeth.

Providing a healthy environment

Better community health is built on awareness, understanding, cooperation and good communication. Children can find out all the factors which favour or prevent a healthy childhood. Based on these findings they can devise actions aimed at improving the environment. For example they could conduct a survey on breeding places of flies, snails or mosquitoes, and either clean them up or eradicate them. Or they could help prevent other children being injured through accidents—including traffic accidents—by finding out what mishaps occur in their
area, working out ways of preventing them and learning how to perform simple first aid.

**Children growing up**

Older children are in a position to play a major part in the growth and development of younger children, so it is important that they understand how young children grow up. School children can be encouraged to note the arrival of new babies in the community, observe the stages of their development and record this information on cards kept in the classroom. They can also record when vaccinations are given and remind parents when the next “shots” are due. Through discussions, stories and role-playing, they may be helped to develop an attitude of caring for the people with whom they live and work.

**Stimulating younger children**

Older children provide the kind of stimuli which are needed by children to grow up physically and mentally healthy. They can learn at school what a baby or small child should be doing at a particular age, and can devise locally made toys and games to help develop physical, psychomotor and intellectual skills. Or they may be encouraged to pass on ideas through games, toys and so on to the non-school attenders in their community.

**Activity Sheets**

The Activity Sheet on “Accidents” explains that many of those that occur could be prevented. A number of activities on the theme of prevention are then presented. It is suggested that after finding out what accidents occur locally, the children should discuss and plan how to prevent them, for instance by taking precautions to prevent burns from cooking stoves, or setting up a “sleeping policeman” (an artificial bump in the road to slow the traffic) at accident spots. The next section of the sheet is centred around what to do if an accident occurs, and the final section includes suggestions on how to disseminate the ideas and evaluate the results. Each activity sheet is set out in a similar way with many concrete suggestions on simple, inexpensive activities for children.

A crucial question remains unanswered. Can these ideas be implemented in societies where they may prove most relevant? To answer this question let us look at a primary school in a mountainous area of Central Java, Indonesia. The high altitude and poor soil are two factors contributing to the poor socioeconomic condition of most of the local people. Health and nutrition problems are common. Leksana Village is one of the many villages afflicted with such problems. However, teachers at the local primary school have got their pupils actively involved in tackling some of these problems. During health lessons, one teacher taught sixth graders how to make a simple sugar, salt and water mixture to prevent dehydration in diarrhoea cases. Not long afterwards, 12-year-old Parni
Schoolchildren can be encouraged to note the arrival of new babies in the community, and the stages of their growth.

Primary schoolchildren—seen here taking part in a tuberculosis control programme in Indonesia—are judged the most accessible age-group for the dissemination of new ideas. (Photos WHO/J. Mohr and WHO/J. Ling)

was able to apply her newly-acquired knowledge when her two-year-old brother suddenly became ill with severe diarrhoea. It is possible that she saved his life, since children in a similar condition have been known to die.

Aware of nutritional problems in the area, the teachers organized grades 4 to 6 to take it in turn to cook lunch for the school once a week. Many of the girls are now cooking similar menus for their families at home. To provide fresh vegetables for the school meals and encourage more growing of fruits and vegetables at home, the school has its own garden, run by the students. It includes a fishpond.

The experience in Leksana Village underlines the fact that the CHILD-to-child programme can only become a reality if it is the concern of many people. The interest and active involvement of the teachers and the support of parents, community leaders and health workers led to maximum results. This is true elsewhere. Only if those in the community who are involved with children decide to develop and support such a programme can the direct link between ideas and action be welded. Existing programmes vary in size from ambitious nationwide projects to very local projects. Both government and non-government bodies are taking the initiative, while political leaders play a big role in providing resources and influencing opinions and attitudes.

But the key agents for change are schoolteachers and health workers and those who train them. The CHILD-to-child philosophy, ideas and activities can serve to strengthen new developments in education and health and in educational and paramedical training. The activities also provide an area in which closer cooperation between teachers and health workers can be attained.

The London-Fittleworth conference report offered a salutary warning: “An over-ambitious programme which fails to live up to its promises may only serve to increase scepticism about new ideas, and cynicism about international programmes which start what they cannot finish. What is needed, rather, are CHILD-to-child programmes (however modest) which succeed and which build on success.”
The hunters of Somalia

by Colonel Muse Rabile Goud
Minister of Health of Somalia

It is with great satisfaction and happiness that I can write, in this message to the readers of World Health magazine, that we are now preparing to celebrate the official certification of the eradication of smallpox from Somalia, the last area of the world where endemic infection occurred. Not only our own country, but all the nations of Africa, and indeed the whole world, can now be considered free of smallpox, after a long and arduous struggle.

A little of the history of the campaign in Somalia—one of the countries of the Horn of Africa—will help to throw light on the many difficulties and setbacks that have faced smallpox campaigners at all times. Endemic transmission of smallpox was interrupted in Somalia in 1963. My country, working in collaboration with WHO, set up a preventive programme in 1969, in which mobile teams of Somali and WHO medical staff were supported by paramedics, by the authorities of the regions, districts and villages, by the police, and by the public at large. The programme carried out about 700,000 vaccinations yearly.

This was a considerable achievement, particularly in view of the fact that so many of the inhabitants of the Horn of Africa region follow a nomadic or semi-nomadic way of life. They cross national frontiers very frequently, and would sometimes bring smallpox with them. In any country, nomads carry all their possessions with them, including the materials from which they build their huts, as well as cooking utensils and water pots, and keep on the move in search of water and grazing for their herds. It is not uncommon for such groups to cover distances of 50-100 kilometres at a time. This kind of movement of population is paralleled by the movement of people into and out of towns and cities. For example, about 12,000 people travel daily into and out of Mogadishu, using all kinds of transport. They come from all regions of Somalia, and trade in leather, charcoal, and wood and other goods.

Nevertheless, in spite of these complications, our system of smallpox prevention appeared to be working quite well. In fact, the main problem after 1963 was to locate and wipe out the occasional outbreaks caused by importations from outside Somalia. Between 1963 and 1971 only two cases were reported anywhere in the country, and from October 1972 until February 1976 there were only 42 cases, most of them imported infections in the northern areas.

For a few months in 1976 we had an apparent respite. But it was not long before the telephones started ringing urgently again in my office. This time smallpox was being reported in Mogadishu. The hunt for the tiny, yet deadly, virus started again, in the thronged streets of the national capital. We began massive day and night "search and vaccinate" sweeps, with the help of the Army, college students, and the Somali workers' unions. But as we advanced into 1977 it became evident to us that the disease, in spite of our efforts, was spreading south from Mogadishu. We widened our search operations, and more and more members both of the administrative services and the general public offered their help. Many of our most dedicated helpers were in fact the nomads themselves, who joined us in the struggle.

The information that started flowing in was extremely alarming. By mid-March two regions in the south were reporting infected areas. Smallpox was being reported in a further seven regions by the month of April. By the end of May ten regions in southern Somalia were affected.

The scale of the operation was constantly being revised upwards. We now had more than 1,000 men in the field, deployed like a small army through the affected areas. To add to our difficulties, heavy rains had begun, transforming many roads into quagmires. Our own resources, and those of WHO, were being strained to the limit. At the same time, the explosion of smallpox was causing acute concern to us because of the possible danger to neighbouring countries.
At that point a national emergency was declared in Somalia, and the international response was swift and generous. An airlift began to Mogadishu, flying in the vehicles and supplies of vaccine and general equipment we so badly needed. WHO sent 23 medical officers trained in smallpox work and technical and administrative support staff. At the same time, the army of Somali smallpox fighters was steadily increasing, and by July 1977 stood at more than 3,500, working to locate smallpox cases and contain outbreaks.

In April the total of cases stood at 157. The May figure rose to 636, and then in June it peaked out at 1,388. Steadily but surely after that the containment efforts began taking effect. In July the total of cases declined by about one-third to 672, and to 220 in August. The epidemic finally came to an end in October, the last recorded case being a 23-year-old hospital cook, Ali Maow Maalin, in the town of Merka, about two hours' drive from Mogadishu. By that time the hunters of Somalia had recorded 947 different outbreaks, involving more than 3,200 cases and 13 deaths. All age groups had been affected by the epidemic, the youngest being a few days old and the oldest over 90 years.

Since that time my Ministry has accepted the responsibility for maintaining full-scale surveillance, with the continuing assistance of WHO. We have kept up an intensive "smallpox alert", making house-to-house checks in towns and villages, and visiting nomadic encampments. In fact, our 800-strong field force has visited about half a million dwellings, checking all reports or rumours that might lead to detection of a smallpox case, and taking specimens for laboratory checking from patients with suspicious-looking skin rashes.

One of the questions that must naturally occur is: How was all this achieved? My answer is that it was based on two important elements—a strong national commitment to the objectives of the smallpox eradication programme, and the unstinted aid of WHO and the international community. With that basis of support and national involvement, and after two years of toil since that last case in Merka, we are proud to be able to make our final and historic report: Smallpox Zero.

Vehicles being unloaded at Mogadishu airport during the emergency airlift. Many nations responded to the appeal for aid against an explosive outbreak of smallpox.

(Commentary: WHO/C. Wilson)
Africa wins freedom from smallpox

Several attempts had already been made to fight smallpox in Africa with "Western" methods, and had not met with marked success. But presently a chink was found in the armour of this deadly virus

by James Magee

The origin of smallpox is located in Asia by some experts, who quote references to a disease resembling smallpox in ancient Chinese and Indian records. On the other hand, there are grounds for the belief that the disease was also long established on the continent of Africa.

What appears to be a record of the existence of smallpox in Africa is written on a human face that is 3,000 years old—the mumified head of the Egyptian Pharaoh Ramses V, who reigned in the millennium before the coming of Christ. We know that Ramses V died of an acute illness at the age of 40. If allowances are made for the changes caused by mummification, the scars on his face do look very much like smallpox, which throughout history showed itself to be no respecter of persons.

From then on there are a number of hints and references in ancient manuscripts, until we learn that the disease was brought from Abyssinia (now Ethiopia) and scattered an army besieging Mecca in 569 AD. The soldiers fled, and their leader Abraha himself died from the disease. "His flesh fell off piece by piece, and as often as a piece fell off, matter and blood came forth", according to the scribe.

In Africa, as in India, the disease was such a terrifying part of the environment that throughout the centuries it acquired cult status, and in Nigeria, for example, was worshipped as a god, Shopanna. He was so feared that his real name was seldom uttered. Instead, he was referred to as a King of the Earth, or Lord of the Open Places, and associated with the destructive power of the noon-day sun.

He could give life, or take it away. Effigies of Shopanna were adorned with pearls, or small calabashes, an allusion to the pustules of smallpox.

In Togo, smallpox was feared as the god Sakpata, and the priests of the rite were believed to have the power of causing the disease. It was also the task of such priests to treat victims of smallpox, very often in a special hut assigned for the purpose, and to dispose of the bodies of victims who died during an epidemic, burning their clothes and belongings. It is evident that the rituals were based on sound reasoning. They included strict rules for public behaviour, including a regulation forbidding large gatherings of people. All these measures would undoubtedly have helped to reduce the number of victims of an outbreak.

African priests also had at their disposal a number of ointments and treatments for those suffering from smallpox, and they also practised variolation. This is the deliberate inoculation of smallpox virus into the skin to produce immunity against the disease (as compared with vaccination, in which a vaccine derived from the harmless vaccinia virus is used). Dr David Livingstone saw variolators at work among the Bechuana tribe in South Africa in 1858, but even earlier this practice was introduced into the American colonies in the early 18th century by slaves brought from Africa.

It was into this world, where smallpox had long been known and dreaded, that the first field teams came to work in the major programme against the disease that had been endorsed by the World Health Assembly in May 1966. It was a world where traditional approaches to dealing with smallpox were known and practised, and with some degree of efficacy. At the same time, a number of attempts had already been made to fight smallpox in Africa with "Western" methods, including vaccine, and had not met with marked success.

Why did the earlier efforts fail to make an impact on the problem? Dr Isao Arita, Chief of the WHO Smallpox Eradication Unit, has pinpointed some of the main weaknesses. They included:

— Lack of a reliable system of case reporting. ("In the year 1967, 131,418 cases were reported from throughout the world but we estimate that the true figure was at least 10 million", he comments.)

— Vaccine of poor quality. ("At the start of the programme 200 million doses of the vaccine were being used annually, but it was estimated that only 15 per cent was effective and of acceptable quality.")

Action was taken to improve this situation. Step by step a network of reporting centres was set up, linking the programme headquarters with hospitals in the main towns, and health centres in the outlying areas. Teams of field workers began to carry out methodical sweeps of all the territory involved, and the information on cases started flowing in.

The region where the campaign began consisted of the following 15 countries: Benin, the Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast, Liberia, Mali, Mauritania, Niger, Senegal, Sierra Leone, Togo, Tunisia and the Sudan. The country was certified free of smallpox in 1978.

Field workers carrying disease recognition cards make contact with a group of nomads in the Sudan. The country was certified free of smallpox in 1978.

( Photo WHO/J. Breman)
Above: One of the challenges facing the smallpox fighters in the Horn of Africa was the problem of gaining access to remote areas. Here a helicopter team arrives in a mountain village. (Photo WHO/D. Henrioud)

Below: Kenya's last case was recorded in 1977, and was due to an importation. Vaccination was important to help protect the population against such risks. Here medical staff check a child's vaccination scar during a visit to a village in northern Kenya. (Photo WHO/C. Simiya)

Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, Togo and Upper Volta, representing a total area of about 2.3 million square miles or almost the sixth part of Australia. And the information showed that the smallpox incidence was the highest in West Africa. It became clear too that this was a battle to save the children—one case in two was a child under the age of 15.

The managers and planners began scaling up all their calculations. Vaccine not only had to be improved in quality, but also had to be made available in the quantities needed—200 to 250 million doses annually. The Soviet Union, which had made the initial proposal to begin the campaign, and the United States both gave massive assistance and were joined by many other nations. At the same time laboratories to manufacture vaccine to the standard required were set up in the countries concerned, backed by tight quality control.

But there were more difficulties ahead. One question still to be solved was how to simplify the basic method of administering the vaccine, so that field workers could be easily trained to do it and could give it quickly and effectively. The answer was the bifurcated, or two-pronged, needle. When it is dipped into vaccine, the two prongs capture just enough of the liquid for a vaccination, and then it is delivered by quick jabs to the arm.

The needles were not only a way of economizing on precious vaccine—one vial was enough for 100 persons—but there was a further saving because they could be sterilized and used again. So a new and very powerful little weapon, not more than a few inches long, was added to the smallpox fighters' armoury.

Smallpox has been by tradition a disease about which much has been learned by observation. So even while the intensified campaign was getting under way, workers in the programme were keeping it under study. And in doing so they began to notice three things which, until then, although previously reported by experts in other parts of the world, had not had much impact on planning. The three points were:

— Transmission of smallpox occurred within villages at a much slower rate than was usually believed;
— The disease could be effectively contained by selective "ring" vaccination of relatively small numbers of persons;
— Of all villages in an area, smallpox was present in only a few at any one time.

Here was the heel of Achilles, the chink in the armour of the deadly small-
pox virus. Very soon after this became clear, the opportunity to test the implications of the “ring” approach to vaccination came in Eastern Nigeria.

Here, the smallpox teams, led by Dr Bill Foege, a former medical missionary who was now attached to the Center for Disease Control (CDC), Atlanta, USA, had set up a very effective case-reporting network with the help of mission radios. But vaccine supplies had not caught up, and they found themselves facing a series of outbreaks. There was just not enough vaccine available to consider vaccination on a mass scale. So they decided to try to locate and pin down the outbreaks, placing patients in isolation—and putting a guard on their houses if necessary—while searching for and vaccinating all possible contacts.

The method, which the experts called “surveillance-containment”, proved brilliantly successful. The virus was trapped each time with the “ring” of vaccination and so one by one the outbreaks were brought under control before they could merge into a huge epidemic. It made possible big savings in manpower, it reduced the time needed to fight an outbreak, and produced big economies in the quantities of vaccine required to combat smallpox. It quickly came into operation in all the countries of the programme.

Meanwhile, systematic vaccination programmes had also been launched in Central Africa, in the following nine countries: Burundi, Central African Republic, Chad, Congo, Equatorial Guinea, Gabon, Rwanda, United Republic of Cameroon and Zaire. Here, too, the results were dramatic, with a steady decline in the number of cases. Then, once the vaccination campaigns were completed, the emphasis switched to surveillance, based on methodical smallpox case-tracking.

Sometimes the smallpox “detectives” were able to locate the virus by investigating active cases and following up the clues provided by the source of infection. At other times they were able to detect smallpox by looking deeper into reports of deaths attributed to diseases such as chickenpox. But most often they got on the trail by following the signs left on the faces of children. Facial pock-mark surveys, both of pre-school and school-age children, provided the information they needed—and a grim warning that smallpox would not easily relax its grip.

So through steamy rain-forest and out across open savannah land, from the cities and towns and into the remote villages, the smallpox searchers pursued their quarry relentlessly. And the case figures continued to fall steadily. Three years and five months after the programme was launched, the chain of smallpox infection was broken in West Africa. The last case was recorded in 1970. In 1971 the last case was recorded in Central Africa. The last case in the area grouping the four countries of Malawi, Mozambique, United Republic of Tanzania and Zambia, was also in 1971.

The lessons learned in these campaigns were carefully noted. Veterans of these programmes brought their knowledge and experience to assist national staff fighting the smallpox campaigns in South America and Asia. In South America, the last case was found in 1971. In Asia, where the most lethal form of smallpox, variola major, was prevalent, the task of eradication was long and arduous. But there came a day, 12 December 1977, when Dr Hallden Mahler, Director-General of WHO, presented what he called “the death certificate of smallpox in Asia” to President Ziaur Rahman of Bangladesh at an official ceremony in Dacca marking the declaration of eradication. Two years previously, the Bangladesh smallpox searchers had tracked down the last case—a three-year-old girl, Rahima Banu—on an island off the coast.

By that time, eight years after the intensified campaign against smallpox had begun, it looked as if the tide had turned. The disease had been eradicated from most of the world, and was now only clinging to its last stronghold in the Horn of Africa. But wars, and rumours of wars, hampered progress. At the same time, the disease was being carried from one part of the region to another by the nomadic population as they moved in search of water and grazing for their herds of sheep and goats. Roads, where they existed, were often washed out by rain and floods.

In spite of the difficulties, Ethiopia reported its last case in August 1976, in a nomad camp in the Ogaden desert. The last defiant stand by the smallpox virus was in Somalia in 1977, as described by Colonel Muse Rabile Goud, Minister of Health of Somalia, on another page. The chain of epidemic smallpox infection, that stretched back without interruption over more than 3,000 years, came to an end on 26 October 1977, in the little seaside town of Merka, not far from Mogadishu. The patient was 23-year-old Ali Maow Maalin, a hospital cook. He recovered. And this time it was smallpox that died.

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**Rumours – but no smallpox**

Since May 1978 the smallpox virus has had a price on its head. WHO has offered a reward of US$1,000 to the first person reporting a confirmed case of the disease. News of the offer has been disseminated throughout the world by the press, radio and television, and a poster, specially designed by the Swiss artist René Gauch, is on display at airports, in hospitals, schools, and other sites.

This invitation to the public to join actively in the final stages of the smallpox eradication programme met with a lively response and, by the time of going to press, more than 90 reports of suspect cases had been received at WHO headquarters in Geneva from all five continents.

All these reports were carefully investigated, and specimens were sent for laboratory checking wherever some doubt might have arisen about diagnosis. All the reports proved negative. Of the total, 24 (or roughly one in four) originated in Africa, as shown in this table:

<table>
<thead>
<tr>
<th>Country</th>
<th>Case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benin</td>
<td>Monkeypox</td>
</tr>
<tr>
<td>Cameroon</td>
<td>Not specified</td>
</tr>
<tr>
<td>Central African Republic</td>
<td>Chickenpox</td>
</tr>
<tr>
<td>Equatorial Guinea</td>
<td>Measles/Chickenpox</td>
</tr>
<tr>
<td>Ethiopia</td>
<td>Unfounded</td>
</tr>
<tr>
<td>Gambia</td>
<td>Unfounded</td>
</tr>
<tr>
<td>Guinea</td>
<td>Unfounded</td>
</tr>
<tr>
<td>Ivory Coast</td>
<td>Drug reaction</td>
</tr>
<tr>
<td>Kenya</td>
<td>Skin disease</td>
</tr>
<tr>
<td>Libya</td>
<td>Chickenpox</td>
</tr>
<tr>
<td>Mali</td>
<td>Unfounded</td>
</tr>
<tr>
<td>Nigeria</td>
<td>Chickenpox</td>
</tr>
<tr>
<td>Rwanda</td>
<td>Unfounded</td>
</tr>
<tr>
<td>Somalia</td>
<td>Unfounded</td>
</tr>
<tr>
<td>Sudan</td>
<td>Unfounded</td>
</tr>
<tr>
<td>Zaire</td>
<td>Unfounded</td>
</tr>
<tr>
<td>Zambia</td>
<td>1 Measles</td>
</tr>
<tr>
<td></td>
<td>1 Unfounded</td>
</tr>
</tbody>
</table>
Major changes are taking place today in the roles of men and women, which are now less polarized than ever before. The dependence of women is on the decrease and male supremacy has almost disappeared. Clearly defined forms of masculinity and femininity have given way to a diversity of make-up, to increasing individualization of forms of behaviour independent of sex, and to uncertain and conflicting expectations.

Marital relations have altered. The family has become smaller while relations between family members have become closer and more intimate. Century-old antisexual tendencies have broken down. Sexuality has entered the arts, and nudity is no longer a taboo. The expression of one’s emotions is accepted.

The double standard (for men and for women) is less apparent; overall sexual activity has increased. The widening gap between sexuality and its purely procreative role is reflected in increasing sexual contacts among people of all ages, a weakening of sexual restraint, early commencement of sexual life and relatively tardy social maturity.

This new ethical climate in many parts of the world has obliged doctors, teachers and parents to try to understand the difficulties children and adolescents face in adapting to such a mobile society, and has made them aware of the need for sex education. However, many people believe that the aims, principles and content of sex education are still unclear or open to argument.

The purpose of sexual education is to

Learning about sex

by D. N. Isaev
The winds of change have brought a new ethical climate to many parts of the world. All the more need for youngsters to be taught common sense about sex. (Photo L. Sirman ©)

help people to lead a satisfactory and healthy sex life. Requirements for sexual health can be summed up as: the capacity to enjoy and control sexual and reproductive behaviour in accordance with a social individual ethic; freedom from sentiments of fear, shame, guilt, false beliefs and other psychological factors inhibiting sexual response and impairing sexual relationship; freedom from organic disorders, diseases and deficiencies that interfere with sexual and reproductive functions.

A survey of sex education in 16 countries of the European Region of WHO suggests it may be tentatively classified into four categories:

1. Compulsory and applied in all schools (Czechoslovakia, Denmark, German Democratic Republic, Federal Republic of Germany, Sweden);
2. Accepted and legal but not applied throughout the country (Bulgaria, France, Italy, Poland, Switzerland, Yugoslavia);
3. Officially approved but not sanctioned by legislation (Netherlands, United Kingdom);
4. Not prohibited, but virtually not developed (Algeria, Greece, Turkey).

Sex education and information are either a separate subject (Poland, Switzerland) or else they form part of various branches of the humanities and biology (Denmark, Federal Republic of Germany, Sweden). Sometimes animal biology is virtually the only source of information on sexual matters (Algeria, Greece, Turkey).

The age at which sex education starts varies widely. In some countries it is even given in certain pre-school establishments (Denmark, German Democratic Republic, Federal Republic of Germany, Sweden, United Kingdom) while in others it generally starts only at the secondary level (Bulgaria, France, Italy). Compulsory sex education is given in both primary and secondary levels in Czechoslovakia, Denmark, German Democratic Republic, Federal Republic of Germany, Poland, Sweden and Yugoslavia.

Generally boys and girls join in discussions on sexual matters; but as there are
Primary and secondary schools in Denmark, as in several other European countries.

Sex education is a compulsory lesson in both opposite sex. Knowledge of sexual functions, taboos, general and medical knowledge, and the way of life.

The effectiveness of sex education depends on the personality of the teachers, their attitude towards their own sexual problems and those of others, and their training. Textbooks and other publications are a valuable aid, but unfortunately there are frequently no compulsory textbooks. The situation is even worse with regard to audiovisual aids. Only Denmark considers that its schools have a sufficient number of aids; the other countries are not satisfied with their aids, and many schools are virtually unable to obtain them.

Means of disseminating suitable knowledge and imparting sound ethical values include radio and television broadcasts, pamphlets, newspaper articles (including specialized ones for children) and discussions. But the diffusion of sex education, as well as its ultimate effectiveness, depends to a large extent on the traditions of the community, the prejudices, taboos, general and medical knowledge, and the way of life.

So what are the aims and nature of sex education? Sex education comprises all that which helps to shape the total personality of an individual capable of recognizing the social, moral, psychological and physiological characteristics of his (or her) sexual make-up and establishing optimum interpersonal relationships with persons of his own and the opposite sex. Knowledge of sexual functions helps to allay feelings of shame, taboo, ignorance, uncertainty and fear in relation to sexuality. This knowledge should prevent the development of bad habits and help children to adapt to their nascent maturity; it should not only prepare the way for sound development of reproductive functions but also inculcate a sense of responsibility for the health and welfare of the future partner and future children, and prevent conflict in marital relationships.

While it takes a number of years for children to learn about their anatomical and physiological characteristics, many more are needed for them to acquire the psychological traits of masculinity or femininity and to understand and internalize the sexual role. The timeliness and completeness of this process provide the basis for self-confidence, fullness of emotions, clarity of intentions and adequacy of interpersonal relationships within the family and the community.

Sex education is often regarded as an intimate process which cannot take place in a large group of people and especially not in the presence of strangers. This has prompted parents in some countries to request the removal of specific topics from school curricula. It has been found, however, that even well-informed parents do not attend to sex education. Some people have concluded that such education should only be given at school; but this is contrary to the view that it should be started at a very young age. What is needed is to bring together the parents, the school and the health services as educators.

The mass media (press, radio, films, television) have a stronger influence on children and adolescents than on adults. The absence of a firm line of conduct or of definite standards of taste, and the fragility of nascent moral values, make films and reading materials dangerous since children and adolescents are not ready to understand them fully. The ambiguity of certain subjects, their incomplete treatment, or the exposure of naked human relationships lead to an incorrect moral appraisal of the behaviour of heroes and heroines and their adoption as models. Educators and parents have the responsibility not only for selecting reading materials for young people but also for ensuring that they understand them and can make a moral appraisal of what takes place. Discussing a book or a film together is more useful than prohibitions or locking up bookcases.

All educational measures must be appropriate to the child's development. It is important to talk to the child about matters on which he asks questions, or which he understands. Account has to be taken of the child’s intellectual level and his sexual knowledge. Nowadays parents and teachers generally try to discuss the relevant topics years after the children have learnt about them on their own. The fact is that no information, conveyed in a readily understandable way and adapted to the child’s particular interests and ideas, should be regarded as premature. All information received by the child produces an emotional reaction and it is therefore important that parents teach the child as early as possible to look on pregnancy, birth and attraction to the opposite sex as positive occurrences which bring happiness.

In summary, then, the attention of parents and the entire community must be drawn to the need to prepare children for life with a partner, marriage and family life. It should be made clear that sex education is one aspect of the formation of a complete and socially active personality, with awareness of the sexual role and the capacity for concern and acceptance of responsibility for one’s own behaviour and for the welfare of one’s partner and future children.

Parents must learn to help children to become properly aware of their sexual role; and they should start sex education as early as possible in the family and then cooperate closely with the school in this sphere. During the educational process, children and adolescents must be free to discuss all sexual matters, and must be encouraged to make moral appraisals in an active way so as to acquire adequate knowledge and, where necessary, to seek help and advice and also contraceptive services. In the interest of parents and the community as a whole, governments should be encouraged to use legal means to make sex education compulsory at teaching institutions.

Finally, the educational process cannot be complete without the participation of medical specialists. Physicians not only provide counselling for children and adolescents with sexual problems but they also educate teachers and parents, and they make a particularly important contribution by disseminating the rules of hygiene and knowledge of all aspects of sexuality.
The day of reckoning for the three Onchocerciasis Control Programme pilots at Tamale, in Northern Ghana, is inevitably Saturday. Sometime on mid-Saturday morning, the pilots will hear on their radio link with OCP Headquarters at Ouagadougou, Upper Volta, just how well they have done their job the previous week. Their jobs are unusual—spraying insecticide on the rivers and streams of the Volta River Basin region, which form the breeding grounds for the blackfly known to experts as *Simulium damnosum*.

The pilots are engaged in one of the most ambitious and sophisticated development projects of our time—a project designed to span a 20-year period and wipe out onchocerciasis, commonly called river blindness. This disease has caused some 100,000 people to go blind in West Africa alone.

Few people in the field of public health have more instant feedback to their job than these pilots. As they tune in to headquarters they will hear how many of the tiny little humped-back flies have been caught in their sector during the last seven days. These are the flies that bite the population and transmit a parasite which causes blindness. The news the pilots want to hear is that the number of flies that have been caught at strategic points along the rivers is lower than it was the previous week. That news will tell them that they have done their jobs well. More often than not the news is good—the figures have come down. But sometimes it goes the other way—and the pilots groan and analyse “what went wrong”.

These fliers are a key link in the “Oncho” programme which covers seven countries around West Africa’s Volta River Basin. For control of onchocerciasis is dependent on insecticide spraying, which can only be effectively carried out by aircraft. Spraying by any other method would be far too slow. And although drugs are in theory available to treat the disease, in practice they have been found to have such detrimental side-effects that they cannot at present be safely used in mass campaigns.

Onchocerciasis has for many years been recognized as a major constraint on development in this area of more than 700,000 square kilometres—considerably larger than the State of Texas. In some villages more than 30 per cent of the adult male population are blind as a result of the disease, but even in less seriously affected villages the socio-economic effects are severe. The “scourge of the river” has forced people to abandon fertile valleys, and has given them no option but to try to eke out a bare living on less fertile and more crowded land elsewhere, often a nearby plain.

The immigration is not confined to moving just a short distance. Young
Aircraft versus blackfly

The pilots who fly for the Onchocerciasis Control Programme are waging a small war, with insecticide as their weapon, against the insect pests that transmit this blinding parasitic disease

by John Madeley

Lift-off on another WHO mission against “river blindness” in West Africa.

(Phote WHO)

men in particular often take the decision to leave the area altogether, and they join the swelling numbers who head for the largest town in search of new jobs. This type of immigration has left some communities virtually denuded of young males. Those communities that have been driven from their fertile valleys by river blindness are dealt a double blow if their young men then desert the harsh plains.

By any standards this region is one of the worst endemic onchocerciasis zones in the world. Home to some 10 million people, it sprawls over seven countries; but the disease is too diverse for any one country to tackle alone and in 1974, after five years of planning, the governments of Benin, Ghana, Ivory Coast, Mali, Niger, Togo and Upper Volta launched the Onchocerciasis Control Programme.

In the dry season of 1975 the insecticide spraying began. And to the satisfaction of the pilots and everyone else involved in the programme, results are coming through. The number of flies has been greatly reduced in the whole area compared with the numbers that were caught in 1974.

The pilots based at Tamale represent one half of the programme’s airborne operation. Another base is situated in the Upper Volta. Tamale base has four helicopters and one fixed-wing aircraft; it covers three of the six sectors in the Volta River Basin. All the pilots at Tamale are Canadian, since the insecticide spraying is under contract with a Canadian firm, Viking Helicopters Limited. This company has also been engaged in the smallpox eradication campaign in Ethiopia.

Chief pilot is 44-year-old Peter Hairsine, and four other pilots make up the team. All are solid professionals with thousands of flying hours under their belt, but all admit to an enormous sense of satisfaction when they see those figures improve on a Saturday morning. They fly their aircraft solo, which means they are at the same time pilot, navigator, insecticide sprayer and wireless operator. Each week they release their sprays over the known blackfly breeding grounds in the rivers and water courses of the region. Weekly application is necessary if the flies are to be controlled.

Monday is the day when the pilots normally discuss any snags that have arisen during the previous week and plan the week’s work ahead. At first light on Tuesday they leave the small airport at Tamale, and each begins an operation which normally takes three days and involves each of them in between 15 and 24 flying hours. On some days they are
Above:
The pest that causes all the trouble. A close-up of the blackfly, *Simulium damnosum*, feeding on human blood. (Photo WHO)

Left:
The dull patch in a victim’s eye shows where the parasitic worm transmitted by the blackfly’s bite has caused irreparable damage. The only real answer to onchocerciasis is to wipe out the fly wherever there are human settlements. (Photo WHO/D. Deriaz)

Right:
Cascades in the Upper Volta River offer a perfect breeding-site for the *Simulium* larvae. Places like this are the targets for the “Oncho” pilots. (Photo WHO/E. Mandelmann)

Flying for a continuous seven or eight hours.

Immediately behind the pilot’s seat is a tank which is filled with the insecticide. When he is over the target area, the pilot pushes a button and the insecticide is released. Helicopters are used because of the need for accurate application to smaller rivers and streams, many of which are covered with a continuous and thick foliage. The pilots often have to hover low over the river, look for a gap in the trees and then press the button. “It would save time if the trees were not there”, joked Peter Hairsine. “But it would make it rather boring.” The pilots press the button and the biodegradable insecticide, Abate, drops down on to the target area. This particular insecticide has been found to combine a high effectiveness against the blackfly with a low toxicity for human beings, non-target organisms in the river, including fish, and plants.

The dosage is calculated on the basis of 0.05 ppm of insecticide applied for 10 minutes in the wet season and 0.10 ppm for 10 minutes in the dry season. In the wet season, when the rivers are flowing fast, the insecticide is quickly dispersed in the water and carried down stream. In the dry season, on the other hand, each individual breeding site has to be treated separately.

Loneliness is one factor that the pilots fight against. “But weather and ground conditions are usually so varied”, says Peter Hairsine, “that there is little chance of getting bored”. From time to time they encounter unusual problems. Large bats flying out of trees and colliding with the helicopters are not uncommon—something which can be unnerving rather than causing serious damage. On one occasion a pilot was having difficulty finding a gap over a thickly foliaged river. Hovering over the far side of the water, he was somewhat alarmed to spot only a few metres below him four lions eating a dead elephant. “One less Oncho pilot if I had broken down there”, he cracked—safely back at base!

Monitoring is carried out continuously. Mobile teams go out to a fixed number of regular catching points in the Basin to survey the progress of the insecticide application. Normally they go by Landrover but occasionally the pilots assist in flying out monitoring teams to the less accessible points. These catching points are strategically situated throughout the Basin; they are generally located on or near a river where the highest number of flies can be caught. On monitoring days the flies are caught over an 11-hour period—practically the whole of the daylight hours. Each week the teams also move to different points on the rivers and water courses and examine a random sample of the breeding sites that have been sprayed.

The Tamale sector of the OCP began in early 1976 and since that time the pilots have had the satisfaction of seeing a significant reduction in the number of flies caught. At one particular point, 400 flies were caught in one day just before the spraying began in 1976. In the last half of 1978, the average catch at this point was down to below 100 per year. This rate of reduction is fairly average. But the most remarkable success has come from one catching point in northern Ghana, where not a single blackfly was caught during the whole of 1978.

The fixed-wing aeroplane at Tamale is flown for a considerably shorter period than the helicopters, but nonetheless 50 per cent of the insecticide sprayed from the base is dropped by this plane. It is ideal for spraying the wide and open rivers in this sector. The chemical can be accurately dropped into these stretches when the plane is travelling at over 60 miles an hour.

Maintenance of the planes can cause problems. Helicopters are essential for the project because of their ability to hover. But helicopters are noted for their sensitivity rather than their toughness. Thanks to good backing from ground staff—plus a healthy supply of spare
There have been no operational hitches since spraying began. Even a ten-day air traffic controllers' strike at Tamale in 1977 did not stop the Oncho planes; they were given special exemption to keep on flying.

The pilots are pumping all this chemical into the rivers of the region—do they ever think of possible ecological damage? Yes they do; all were well-briefed on this aspect. “The insecticide we are using has been actually used for the treatment of drinking water”, one of the pilots pointed out. “And the ecology people who are watching the programme very carefully for any detrimental ecological side-effects seem to be satisfied that no damage is being done to either fish or plant life. And in fact, more insecticides potentially more toxic than Abate go into the rivers from agriculture than we spray from aeroplanes.”

During the week, the pilots stay overnight in different parts of the sector, so they have plenty of opportunity to talk to people living there and find out their reactions to the programme. “Local people often realize that something important is happening”, said one pilot. “They are of course aware that blackfly causes so much blindness in the area and know full well that, if these flies are eliminated, their children and young people have a better chance of keeping their sight.”

It has been estimated that the spraying will have to continue for 20 years before the blackfly is finally eliminated. But, encouraged by results so far, people are already beginning to drift back into the fertile valleys they abandoned years ago. In parts of the Volta River Basin area, where spraying has been going on for five years, there are a number of official resettlement programmes.

One scheme in the Dieoubugou region of Upper Volta, for instance, is enabling people to move back into their former valleys; they receive help in the initial stages before the first crops bear fruit. The Ghanaian Government has also recently launched a resettlement scheme. This is being jointly financed by the African Development Bank and the United States Government.

The Onchocerciasis Control Programme, jointly sponsored by WHO, the Food and Agriculture Organization (FAO), the UN Development Programme (UNDP) and the World Bank, is not only one of the most ambitious development programmes of recent years; it also has the hallmarks of being one of the most successful. In December 1978, Dr Halfdan Mahler, Director-General of WHO, announced that the programme was on target and had already achieved a 75 per cent reduction in the disease-carriers in the area sprayed. Like the 700 other people engaged in the Oncho project, the pilots at Tamale have every intention of turning that figure into 100 per cent.

In the district of Wiawso, in mid-Ghana, the results of the project are being seen in a dramatic human way. No child in the district under three years of age is now suffering from river blindness. It was just three years ago that the pilots began to spray insecticide on the rivers and streams that meander through Wiawso.
Five goals proposed for global campaign against smoking

Five goals to be achieved by 1983 in worldwide action against smoking have been proposed by Dr. H. Mahler, WHO Director-General.

Addressing the Fourth World Conference on Smoking and Health held in Sweden last June, he posed the following questions:

- Are there countries where smoking is still on the rise? Can we halt this rise in the next four years?
- Thirteen countries have already ended all advertising and promotion of tobacco products. Can we bring this number to 30, perhaps even 50, by 1983?
- Before 1983, can we persuade governments that a substantial percentage of tobacco taxation should be devoted to continuing mass information and education campaigns?
- We know that children who begin smoking at an early age run a great risk of becoming heavy adult smokers. Can we make aggressive motivation against smoking compulsory by 1983 in all primary and secondary schools?
- Can we make smoking socially unacceptable, particularly among children, by 1983?

In spite of incontrovertible evidence that smoking presents serious risks to health, millions of people around the world smoke, and few countries have done much about it. However, since the publication of the Report of the Royal College of Physicians in the UK, and the US Surgeon-General's report in the early 1960s, incineration of cigarette-smoking as a cause of many serious diseases, a number of countries have begun to take legislative action and promote health education programmes designed to reduce the habit.

WHO has stepped up its own programme against smoking. The WHO Expert Committee Report on Controlling the Smoking Epidemic issued last May contains a number of concrete and strong recommendations. The theme selected for World Health Day 1980 is "Smoking or Health: the choice is yours". A wide range of information activities will dramatize the theme and build public support for efforts by governments and non-governmental organizations to fight the menace.

Protection against six diseases for $3

During the coming decade, the cost of immunizing a child against six major diseases of childhood will average approximately $3.00, according to a mid-year report on some aspects of WHO's work.

Included in WHO's Expanded Programme on Immunization (EPI), the six diseases—diphtheria, pertussis (whooping cough), tetanus, measles, poliomyelitis and tuberculosis—are under attack in more than 90 countries in the developing world. The fact remains, however, that despite the low cost and ease of delivery of immunizations, less than 10 per cent of the 80 million children born each year in the developing countries are being immunized.

The reasons are many. Even the low cost of $3.00 per child adds up to an amount beyond the means of many developing countries. Most countries lack trained persons to manage and deliver the programme. The vaccines generally have a poor keeping quality, and in hot tropical climates it is not possible to run an immunization programme without setting up an extensive cold chain system for the storage and distribution of the vaccine.

Immunization campaign in the Philippines

EPI is a response to these challenges and has the following objectives: to reduce deaths and sickness caused by the target diseases by providing immunizations against them for every child in the world by 1990; to promote self-reliance among the countries in the delivery of immunization services within the context of comprehensive health services; to promote regional self-reliance in matters of vaccine quality control and vaccine production.

In the 1980-81 biennium WHO will spend some $8 million from its regular budget to cooperate with governments in developing immunization programmes and to provide global and regional coordination for training, improved programme management and research. UNICEF will continue to be the major donor of vaccines and supplies to the programme. Another major partner, the UN Development Programme (UNDP), has allocated $1.9 million to be spent on the development of vaccine quality control methods and vaccine production.

Of the $3.00 estimated to be spent on each child in immunizing him/her against the six diseases, half will be the contribution of national sources (personnel, facilities and operating expenses), and half will consist of outside contributions (vaccines, cold chain equipment and transport).

Towards the end of the decade, as the goal of immunizing every child in the world approaches, the programme will need contributions totalling US $150 million per year from donor governments and agencies. At present less than $5 million are being provided from external sources as direct support for expansion of national immunization programmes.

WHO has appealed for donor assistance for long-term support to national programmes to permit operations to be sustained for periods of at least five years.

Special stamps to mark Year of Child

More than 175 postal administrations all over the world have so far indicated that they will issue special stamps to commemorate the International Year of the Child (IYC).

This is in response to an appeal made by the Universal Postal Union (UPU) on behalf of IYC. With very few exceptions, revenue from the sale of these stamps does not benefit children in any way, but the IYC First Day Cover (FDC) and Mint Stamp programmes will make this possible. The benefits from the sale of covers and mint stamp albums will be used directly for programmes sponsored by UNICEF, UNHCR, ILO, UNFPA and UNESCO in the least developed countries.

A total of about Sw.Fr. 2.5 million is expected to be raised.
Illustration on First Day Cover issued by Malaysia.

Both FDC and mint stamps are available in a choice of collections, either worldwide (plus free albums) or by continent. Each FDC bears a photo of a child from the country in question, while the mint stamp album is illustrated with drawings reflecting the stamp designs.

With over 200 First Day Covers and between 400-500 stamps, this collection surpasses that of any preceding commemorative year.

Those interested in contributing to this worthwhile effort—and in acquiring a valuable collection—may request free documentation from the IYC Secretariat, Palais des Nations, Geneva.

Another fund-raising idea that has paid off handsomely is the UNICEF-IYC shopping bag. More than 5 million of these bags have so far been sold through some 65 major supermarket chains in 18 countries in Europe.

Devised especially to draw attention to the objectives of IYC and UNICEF, the bags carry designs in full colour contributed by four well-known artists: Dorit Ben-Ari, Israel; Ivan Chermayeff, USA; Robert Constantin, France; and Ame Larsen, Denmark.

The 65 supermarket chains have been selling the bags on a no-profit basis to ensure that the full profit can be utilized in support of UNICEF programmes in developing countries. The bag sale has so far netted $250,000. UNICEF's goal for the Year of the Child is to sell 25 million shopping bags which would bring in about $1,250,000.

To reach the target, UNICEF needs many more orders for the bags, which are expected to come in when the special Christmas design shopping bag is offered for sale. Information in this connection can be obtained from the UNICEF National Committee in each country or from UNICEF/GCO, Palais des Nations, 1211 Geneva 10.

Pictorial aids for medical teaching

Colour microfiche, a cost-effective system for disseminating teaching aids, will have a part to play in a special "illustration bank" on tropical parasitology under WHO's health learning materials programme. The material is being made available in both slide and microfiche forms, with explanatory texts. A microfiche of 84 frames can be produced for around $100, and copies from this master set may be obtained for less than $1 each. The same material in slide form would cost about $36.00 per set.

The first set in the tropical parasitology programme is on schistosomiasis, and may be purchased from the Royal Tropical Institute, Department of Tropical Hygiene, 63 Mauriskade, Amsterdam-Oost, Netherlands. Other sets will be devoted to leprosy, malaria, leishmaniasis, trypanosomiasis, geohelminth infections, filariasis, amoebiasis, other helminth infections and other protozoal infections.

This series is the initial effort in a continuing programme to develop an international slide/microfiche bank on medical and health-related subjects.

Several other institutions, particularly in the USA, are producing teaching programmes in this form. The American College of Physicians, Philadelphia, has developed self-instructional units for the continuing education of physicians, each comprising audio cassette, self-assessment test, and colour microfiche.

Topics already covered include: Hodgkin's Disease; chest X-ray interpretation; respiratory failure; blood gases; office gynaecology for primary physicians; non-infectious and infectious problems; blood component therapy; diagnosis and treatment of external eye problems; headache diagnosis mechanisms and treatment; breast cancer; clinical diagnosis of anaemia; drug interactions; shock; transient ischaemic attacks; dermatology; nuclear medicine and thyroid diseases.

The University of Washington, Seattle, has also produced similar material in colour microfiche and can arrange to produce it for other organizations under contract.

Further information concerning colour microfiche systems can be obtained from Educational Communication Systems, Division of Health Manpower Development, WHO, Geneva.

In the next issue

Health for All by the Year 2000: dream or reality? One of the many distinguished contributors to the November issue of World Health answers this question by saying: "It all depends on the conscience of mankind." This special issue considers all aspects of the noble goal that WHO has set itself over the next two decades.

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World Health, WHO, Avenue Appia, 1211 Geneva 27, Switzerland
Smallpox victim in Africa—a sight the world may never see again.  
(Photograph by WHO/J. Breman)