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ALL FOR HEALTH*

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NEARLY FIFTEEN YEARS ago when I was invited to deliver my inaugural lecture as Professor of Anatomy at the University of Ceylon, now the University of Peradeniya in Sri Lanka, I spoke on the developments in Anatomy, from ancient to modern times. At the conclusion of my lecture I realized that only a handful of my largely non-medical audience had appreciated what I had said. Based on this experience, I have today in the selection of my topic 'All for Health' attempted to democratize the interest in and concern for health. Health is a matter of universal concern and each one of us individually or on a community basis is concerned with the attainment and maintenance of health. The concept that needs to be recognized and accepted, and is in fact the cornerstone of my lecture, is the difference between the maintenance of optimum health and the curing of disease. While the latter function has become the major responsibility of the medical profession, the more important one of maintenance of health is the general responsibility of individuals and of society at large in a collective sense.

Cost-effective training of health personnel is a basic and imperative need in developing countries which are grappling with the problems of good health care and living standards. These goals in the long term contribute in no small measure to the social and economic future and well-being of these countries. While curative and diagnostic specialists are indispensable, the philosophy of 'total health' through all the other components and imputs affecting the health of populations needs to be incorporated into the training of medical personnel as well as into social and economic development plans.

The inter-relation between disease and poverty has been clearly demonstrated and needs no confirmation. It is, however, paradoxical that even the affluent countries of the West such as the U.S.A. have not been able to overcome poverty and consequent disease problems as seen in the ghettos of the big cities. It seems that one of the most direct approaches to achieving high health standards is the alleviation or elimination of poverty. Once again the affluent countries of the West, afflicted with serious problems of diseases of affluence, such as cardiovascular disease, have proved otherwise. It is appropriate to quote from Ivan Illich's *Tools for Conviviality* (pp. 3–4):

> the unwanted hygienic by-products of medicine began to affect entire populations rather than just individual men. In rich countries medicine

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began to sustain the middle-aged until they became decrepit and needed more doctors and increasingly complex medical tools. In poor countries, thanks to modern medicine, a larger percentage of children began to survive into adolescence and more women survived more pregnancies. Populations increased beyond the capacities of their environments and the restraints and efficiencies of their cultures to nurture them. Western doctors abused drugs for the treatment of diseases with which native population had learned to live. As a result they bred new strains of disease with which modern treatment, natural immunity, and traditional culture could not cope. On a world-wide scale, but particularly in the U.S.A., medical care concentrated on breeding a human stock that was fit only for domesticated life within an increasingly more costly,man-made, scientifically controlled environment. One of the main speakers at the 1970 A[merican] M[edical] A[ssociation] convention exhorted her pediatric colleagues to consider each newborn baby as a *patient* until the child could be certified as healthy. Hospital-born, formula-fed, antibiotic-stuffed children thus grow into adults who can breathe the air, eat the food, and survive the lifelessness of a modern city, who will breed and raise at almost any cost a generation even more dependent on medicine.

In recent times there has been an increasing awareness that preventive health-care is preferable to curing disease. Yet most countries spend nearly 75 per cent of their health budgets on medical and hospital care rather than on preventive health-care; and whilst every effort is made to produce more sophisticated cures for disease and millions of dollars invested in drug research for chemotherapy, negligible efforts have been directed towards producing better standards of health for individuals. At the International Conference on Primary Health Care held at Alma-Ata in September 1978, a resolution was made that the objectives of the world community in the coming decade should be the attainment by all people of the world by the year 2000 of a level of health enabling them to lead socially and economically productive lives. Though nearly five years have lapsed since then, no significant progress has been made in this direction. In fact primary health-care has been replaced by primary medical care and the emphasis in medical teaching is one of patient care and cure.

This approach derives from the early Egyptian and Greek systems on which modern Western medicine is based and in which the patient was the centre of medical attention. The physician was essentially required to be a diagnostician and to carry out a curative function. Beyond this role he contributed very little to the general welfare of his patients and was unconcerned or unfamiliar with the disease-causing factors and forces of the patient's environment and life-style.

The Eastern system of medicine on the other hand, as exemplified in the Ayurveda system, was based on a different and more positive approach to health — that of healthy disease-free living. A system that recognized the totality of the individual both in terms of the interdependence of physical and

mental functions and faculties as well as the inseparability of the individual from his environment. The practice of these systems is believed to date back to very early recorded medical history. Cumston (1926, p.55) and Puschmann (1966, pp. 7–18) record the earliest establishment of such hospitals in Sri Lanka around 400 B.C. The ancient system of medicine first established in India by Sustuta and Charaka was divided into Rig-Veda, the art of healing, and Ayurveda, the science of long life. Ayurveda is still actively practised in some parts of India and in Sri Lanka is in the only form of health care available in some rural areas.

The Ayurveda system is based on the concept of long life through health, and of the body being composed of four elements: Patavi, solidity or cohesion, Apo, fluidity; Vayo, motion, wind or gas; and Thejo, heat. The basic body functions were classified into: Vath, pressure, Pith, metabolism; and Sem, secretion. Health was dependent in the interbalance of these elements and functions. The system also incorporated codes for healthy living, including dietary, socio-cultural and behavioural norms and desiderata. Certain foods were recommended as healthful while consumption of others was discouraged. Vegetarianism and consumption of dairy products like milk, butter, cheese were advocated while the drinking of alcohol and smoking were discouraged. These codes included rules of hygiene such as practice relating to the boiling of drinking water and disposal of body wastes. This brings to mind Deuteronomy 23:12–14 which also gives a record of hygienic disposal of excreta:

> You shall have a place outside the camp and you shall go out to it, and you shall have a stick with your weapons; and when you sit down outside, you shall dig a hole with it, and turn back and cover your excrement: because the Lord your God walks in the midst of your camp to save you . . . therefore your camp must be holy that He may not see anything indecent among you and turn away from me.

In Ayurveda, rules of conduct and social behaviour conducive to good health were laid down. Greed and anger were considered distasteful and stress-promoting, and spiritual activities exalted as a source of serenity and mental happiness. Meditation, currently being revived and emulated in Western countries for its stress-relieving effects, was recognized as an important activity for mental and physical health. Eastern religious codes were also cognizant of the need for mental and spiritual strength, stability and activity as essential ingredients for physical well-being. The Buddha, who lived over 2,600 years ago, when asked what was man's greatest blessing, stated quite categorically in Pali 'Arogya parama labha' which means 'Health is the greatest blessing'. He further expounded on the 'Mind as the forerunner of all good states — mind is chief, mind-made are they. If one speaks or acts with a pure mind, because of that happiness follows one even as one's shadow that never leaves.' This theory is expressed in another quotation: 'The world is led by mind [thought], by mind the world is drawn along'; and the development of the mind was seen in

Buddha's teachings as the most powerful means of achieving mental and physical well-being and serenity.

The Ayurvedic medical codes included norms of sexual and social behaviour conducive to good health and it is interesting to note that countries such as Sri Lanka were free of sexually transmitted diseases such as syphilis and gonorrhoea until the invasion by the Portuguese in 1505. Environmental factors such as noise and dust were recognized as disease-promoting agents; a healthy environment was seen as one free of such elements.

These principles of the Ayurveda system are also reflected in the ancient Chinese traditions of medicine. The basis of these theories was that the body consisted of two components, the Ying and the Yang, and health depended on the harmonious balance of Ying and Yang. The equivalents of Ying and Yang in modern medicine, in my opinion are probably the sympathetic and parasympathetic components of the autonomic nervous system.

It is seen therefore that in ancient Asia the science and practice of medicine were based on the idea of man as an inseparable component of his total environment, and as a complex of internal forces, both physical and mental, and the harmonious balance on which depended health. Social and religious examples of the food and of pure life were provided through the lives of saints, scholars and respected elders in the community whose values and example were respected and emulated even by powerful war-lords and kings.

How is it possible to revive these approaches and principles of health-care and training and apply them in the modern-day context?

Nearly 80 – 85 per cent of the estimated populations of developing countries live in rural areas and they do not have adequate nutrition or safe drinking water; they do not have adequate housing, education, land-ownership, sanitation, meaningful employment or health-care services. This pattern is seen in the developing countries of Africa, Asia and Latin America. Rural health cannot be looked at without reference to the other inter-related rural problems. For instance malnutrition cannot be solved without reference to land hunger, lack of water for irrigation, economic factors, rural technology, education and the other amenities available to the urban population. Often governmental agencies are incapable of providing the necessary relief to the rural areas as the officers responsible for all such schemes and measures are not sufficiently motivated or dedicated. These officers are often ignorant of the way of rural life, the customs, beliefs, superstitions and the general sociological and cultural patterns that are part and parcel of the rural setting. It is the view of Ammundsen and her colleagues (1973, pp. 104, 106) that

> the differences between urban and rural societies, between regional and ethnic groups, and between persons with different ways of living and values, make it essential that the interface between the consumer [of health] and the health service be influenced by the consumer and that the accepted pattern serve the needs of both the health service and the consumer . . . [for the] causes for dissatisfaction of population about their

health services can be summarized as a failure to meet the expectations of the population, an inability of health services to deliver a level of national coverage adequate to meet the demands and the changing needs of different societies, a wide gap [which is not closing] in health status between countries, and between different groups within the countries, rapidly rising costs without a visible and meaningful improvement in service, and a feeling of helplessness on the part of the consumer who feels [rightly or wrongly] that the health services and the personnel within them are progressing along an uncontrollable path of their own which may be satisfying to the health professions but which is not what is wanted by the consumers.

At this stage it is worth looking at some facts and figures about the situation in the world in general and in Zimbabwe in particular. According to a W.H.O. lecturer (Alagiah, 1982, pp. 3–4):

> Every year 500 million people (1/8 of the world's population) fall victims to water related diseases. Every single day 30,000 people (half of them infants) die of these diseases. 50% of hospital beds are occupied by patients suffering from these diseases. It is estimated that 80% of man's illnesses, in impoverished developing countries, is water related.
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> Illness and death are not all the sufferings caused by bad water or the lack of it. Every single day hundreds of millions of people in developing countries waste vast amounts of time and energy carrying heavy loads of water over long distances.
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> Women and children bear the brunt of it. For tens of millions of children the day starts with a long difficult walk to fetch water . . . [before] they drag themselves to school . . . In . . . Upper Volta, mothers daily walk for two or three hours to stagnant water holes or the river, 12 kilometers [a]way, and return with 25 kilos of water on their heads. In the process they burn up . . . 1/3 [of] their daily average food intake.
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> If all this time and energy . . . could be saved, by the provision of easily accessible water, what great benefits could accrue to the community. The women could engage in farming, cottage industries etc. and the children could concentrate on their studies and grow up to be more useful citizens.
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> Sanitation is a concomitant feature of water supply. Bad sanitation is often the cause of unsafe water supplies. Likewise, provision of plentiful water supply could lead itself to sanitation problems . . . [for] bad sanitation is the cause of many helminthic diseases.

In view of the debilitation that such diseases cause among the rural masses of tropical and semi-tropical areas, it is not surprising that Dr Halfdan Mahler, the Director-General of W.H.O., in launching the International Drinking-Water Supply and Sanitation Decade at a special seession of the United Nations General Assembly in 1980 said 'Because of what it will imply, both in planning and results, the number of water taps per 1,000 persons will become a better indicator of health than the number of hospital beds' (W.H.O., 1981a, p.26). In order to achieve this improvement, however, much capital is required. Approximately U.S.$30,000 million would be needed annually over a ten-year period. By conservative standards a sum of U.S.$80 million is needed every day. Yet U.S.$240 million are burnt up as cigarettes and

U.S.$10 million on tranquilizers daily. The daily spending for military purposes is U.S.$1,400 million. Thus, if half these amounts are spent on improving water supplies and sanitation in developing countries, the citizens of these countries could look to a brighter, happier and more hopeful future (Alagiah, 1982, p.5).

But there are many other health problems. In a statement published by the W.H.O. in 1981 it is said:

> Nearly 1,000 million people are trapped in the vicious circle of poverty, malnutrition, disease and despair that saps their energy, reduces their work capacity and limits their ability to plan for the future. For the most part they live in the rural areas and urban slums of developing countries. In the developed countries infant mortality is between 10–20 per thousand and in developing countries it is 100–200 per thousand. Of every thousand children born into poverty in the least developed countries, 200 die within a year, 100 die before the age of 5 years and only 500 survive up to 40 years. Most deaths are from infections and parasitic diseases. Diarrhoeal diseases caused by human faecal contamination of soil, food and water cause high mortality in the population. Disease caused by insects and their vectors rate high; in Africa alone at least one million people die each year from malaria. An estimated 200 million people suffer from schistosomiasis, and onchocerciasis or 'river blindness' causes blindness in a fifth of the adult population in some regions of Africa. Undernutrition is a tragic result of poverty and land hunger, and in developing countries only two thirds of energy requirements, in kilocalories daily per person, are obtained. Illiteracy and lack of education play a major role in causing ill-health. Some 900 million adults in developing countries are unable to read or write and only 4 out of 10 complete 3 years of primary school (W.H.O., 1981b, p. 4).

Such problems are also aggravated by the shortage of medical manpower in these countries:

> To illustrate the disparities among countries, in the least developed countries one health worker of all categories, including tradtional practitioners, has to serve on the average 2,400 people, in the other developing countries 500 people, and in the developed countries 130 people. As for medical personnel, in the least developed countries there is one doctor for an average of 17,000 people, in the other developing countries one for 2,700 people, and in the developed countries one for 520 people (W.H.O., 1981b, p.4).

Many of these problems are suffered by Zimbabwe and in the report *Planning for Equity in Health*, such inequalities are listed and nutritional deficiency in children is highlighted. In surveys undertaken by the Ministry of Health it has been shown that nearly one third of children between one and five years of age in communal areas showed definite evidence of malnutrition (Zimbabwe, 1981b, p.6). A study by Chikanza and his colleagues in our own Faculty of Medicine (1981, p. 89) showed that undernutrition was prevalent in children, of under five years of age, of employees of farm-owners. 'In a food exporting country this situation is a national disgrace. It reflects the unequal

ownership of the means of agricultural production, notably of good land.' Even in Harare, a City Health Department Survey in 1980 of 33,000 children showed that 25 per cent showed evidence of undernutrition (Zimbabwe, 1981b, p. 6). Infections play an enormous role in causing disease and death amongst the young. Among the most important causes of child mortality are diarrhoea, pneumonia, whooping cough, measles, tetanus of the newborn, malaria and tuberculosis. All these are preventable and are related to an inadequate supply of safe water and an inadequate excreta-disposal system. The racial distribution of diseases among the White and Black population has an incidence ratio of 1:9. These figures speak for themselves.

The Report of the Commission of Inquiry into Incomes, Prices and Conditions of Service showed that in 1979 the average total income of the non-African worker was well over $8,500 per year while urban Blacks in formal employment earned an average of Z$1,150 (both figures underestimate family income where there is more than one wage-earner). The average income of peasant farmers was estimated to be Z$220 per year (Zimbabwe, 1981a, p. 77). In the same period the mean income of a private medical specialist was estimated at Z$40,000 per year (Zimbabwe, 1981b, p. 39 and Table 14). Thus it is not surprising that a clear inverse relationship has been established between family income and infant mortality in Zimbabwe (ibid.).

In a 1962 survey of the 19.5 million acres of land most suitable for intensive cultivation, 77 per cent was allocated to the Whites (Zimbabwe, 1981b, p. 11). It is said that when the early White men came to Zimbabwe they read the Bible and the Africans owned the land. Now the Africans read the Bible and the White men own the land. In education there are similar disparities, with eighteen times as many Whites as Blacks, proportionately, receiving secondary education (ibid., p. 12).

In 1980/81 the Ministry of Health's budgeted expenditure was Z$77.4 million representing 65 per cent of national expenditure on health care and about 5 per cent of total government expenditure. Of this budget 88 per cent was for hospital care, 8 per cent formed the preventive services vote, including a grant to the Family Planning Association. The following table drawn from the Reports of the Secretary for Health for 1979 and 1980 (Zimbabwe, 1980, Table 2; and 1982, Table 2) show fifteen diseases as causing highest mortality; and it is obvious from these figures that most of the diseases causing mortality are preventable if adequate and proper health measures are available.

The Primary Health Care Conference at Alma-Ata in 1978 agreed that the promotion of food supply and proper nutrition, an adequate supply of safe water and basic sanitation, maternal and child health care including family planning, immunization against the major infectious diseases, prevention and control of locally endemic diseases, and the appropriate treatment of common diseases and injuries and provision of essential drugs would provide primary health-care. This means the improvement and development of agriculture,

Table

MOST FREQUENT CAUSES OF DEATH IN ZIMBABWE

Cause	Number of Deaths *1979*	*1980*
Diseases of respiratory system	2 181	2 441
Viral diseases (measles, hepatitis, polio)	2 064	1 430
Diseases of perinatal period	1 569	2 287
Intestinal infectious diseases	1 311	1 227
Transport accidents	888	1 245
Homicide	866	1 509
Malignancies	400	874
Nutritional deficiencies	851	864
Circulatory diseases	688	942
Diseases of digestive system including cirrhosis	773	819
Tuberculosis	398	488
Bacterial disease	686	421
Cerebrovascular disease	670	648
Other accidents	511	630
Arthropod-borne (malaria)	165	357

animal husbandry, food industry, education, housing, public works and communications. To achieve these objectives, responsibility for the health of the people cannot lie only with health ministry personnel or with the medical profession. It is obvious that many diseases are caused by inadequate or poor quality water. The provision of such water is the responsibility of the appropriate ministry of a government. Similarly in cases of malnutrition the answer to the solution of the problem lies outside the province of health personnel. The proper development of agriculture, and the marketing and availability of essential food at low cost are functions which have to be carefully promoted and monitored by the government. Diseases caused by poor housing and sanitation are common in all Third World countries and with the increase of population the situation is getting worse. Returning patients to the same environment that caused the disease only makes them come back again and again for treatment, at tremendous cost.

The aim of promoting health and also providing medical care cannot lie only with the medical profession. The establishment of a health authority with powers of co-ordinating health promotion and curative services is essential. Under the health authority there should be division of responsibilities between those actively engaged in promoting health and those promoting curative work, with close integration and monitoring between the two. The promoters of health should be responsible for providing safe water, housing, sanitation, education, adequate nutrition, agriculture and health education, and for job

creation. The curative group should diagnose and treat disease, educate for health, undertake immunization procedures, carry out epidemiological studies when diseases are reported and inform the health promoters so that correct action may be taken, undertake family-planning procedures, and provide cheap essential drugs. The medical personnel must establish the various parameters for health in each population group, such as height, weight, blood count and other norms for that particular country, and give advice on what foods must be eaten in order to achieve those norms.

The success or failure of such a programme will depend on the implementation of the political philosophy of the government in a country. As Emery (1974, pp. 40–5) has noted, in China during the Cultural Revolution there was severe criticism of public health work because it was serving only fifteen per cent of the population. The peasants could not get treatment, and they had no doctors and no medicine. The Ministry of Health was not the people's Ministry of Health; it had become 'the towns' and mandarins' Ministry of Health'.

The late Chairman Mao then redistributed a large proportion of the urban health personnel to the rural areas and created mobile medical teams from medical schools and hospitals to visit rural areas to further strengthen the health services by demonstration, teaching and in-service training. This effort resulted in the training of large numbers of auxiliary personnel — the 'barefoot doctors'. Emery outlines the nature and functions of this 'barefoot doctor' in China and the integration of traditional and preventative and curative functions of modern medicine. The overall ratio in 1973 of barefoot doctors was 1 to 650 people, and by December 1973 a total of 1,220,000 had been trained. The 'barefoot doctors' work predominantly in rural China where 75–80 per cent of the population lives.

In Third World countries where populations are at bursting point the medical personnel turned out by the medical schools never hope to deliver reasonable medical care except to a small portion of the population. In addition to the medical graduates, other categories of health personnel, with less training, are necessary to bridge the deficit. In Zimbabwe in 1980, according to the report of the Secretary of Health (Zimbabwe, 1982, p. 63), there were, to cater to an estimated population of 7,360,000:

Doctors	1 148
Dentists	158
Chemists	354
General Nurses	4 652
Midwives	2 351
Maternity Nurses	139
Medical Assistants	2 897
Enrolled Nurses	191

Later statistics are not available, but it is obvious that, even if these

numbers of personnel are doubled. medical care could never reach the entire population which, it must be remembered, increases each year. In many Third World countries attempts to increase the number of medical schools, and subsequently the intake of students, have not improved the situation appreciably. In Sri Lanka, for example, 120 medical graduates graduated yearly from Colombo, up to 1961, when the population was under 10,000,000.

In 1962 a second medical school was opened in Peradeniya and from 1968 another 120 graduated yearly. By 1970 because of deteriorating economic conditions, poor facilities and poor salaries, many medical graduates started to emigrate to the developed countries and in an eight-year period nearly 2,000 medical graduates had emigrated. In 1978 the government opened two new medical schools, one in Galle and one in Jaffna, with a combined additional intake of 175 students due to graduate in 1983. Yet, in 1982 there were 800 medical institutions without any medical officers. In 1981, a fifth medical school, privately run, was opened with an intake of 100.

In 1974, the Ministries of Health and Education entrusted me, as Dean of the Medical School, with the task of carrying out a feasibility study and formulating plans to train medical personnel within a shorter period of training than that of the conventional medical programme. The cause of emigration of the five-year doctor was studied and it became abundantly clear that the main causes for doctors leaving Sri Lanka on appointment to rural areas were: (i) poor facilities prevalent in the rural hospitals which produced job dissatisfaction; (ii) lack of proper housing; (iii) lack of proper schooling for children; (iv) poor salaries; (v) inability to purchase essential items of food; (vi) lack of social contacts; (vii) poor roads and transport facilities; and (viii) lack of opportunities for further education and personal advancement. A survey was undertaken to ascertain the conditions of the major provincial hospitals and the available staff to train medical personnel on a course of two and a half years' duration, and it was found that the provincial hospitals could train such personnel in each hospital provided that the numbers were small.

A committee was then set up under the Medical Education Unit at Peradeniya to draw up objectives for the course and a curriculum. It was the decision of the committee that the curriculum should not be merely an abridged version of the five-year curriculum of the medical schools which basically followed the British tradition but be geared to realistic needs and goals. These medical personnel were to complete their course in two and a half years with a six-month internship. The method of selection was also different in that they were selected primarily from rural areas and from among those who showed other all-round qualities besides mere academic achievement. It was also the intention of the committee to see that these medical personnel would go back and serve in the areas from where they had been selected.

The selection process was different in that promising young people were

nominated by the schools, rural societies, monks and prominent citizens to the local Member of Parliament, who in turn chose three to five of these nominees from the district and forwarded their names to the Ministry of Health. The performance at the G.C.E. 'O'-level was given preference over performance at 'A'-level. They were interviewed for specific qualities by the official Health Ministry and the University. The selected candidates were then allocated in numbers of 30 to 50 to each of the provincial hospitals where the practical teaching was conducted by Health Ministry Medical Officers. The universities monitored the progress of the course.

The desired characteristics of the end-product were clearly stated. Emphasis was laid on health promotion and preventive medicine with a limited list of pathological states that had to be treated. Family-planning programmes, maternal and child-health care, immunization, health education and good relationships with rural people were stressed. The students were taught how to administer a small rural hospital called a peripheral unit. The other great difference from the M.B.B.S. course was that these students had to function in a health team, and this aspect was stressed from the beginning.

Basic sciences were not taught as anatomy, physiology and biochemistry but as structure and function of body systems, by the same teacher with very little detail. They then learned clinical medicine in the hospital but practised it under supervision in the field. Sociology, behavioural science and public health were taught for two years.

After a six-month period of internship the health worker was posted to the rural areas, taking charge of a small peripheral unit. This programme was found to be quite successful. These health worker's were called Assistant Medical Practitioners. They proved to be very dedicated and highly motivated. Several medical consultants have confirmed this view. In fact many consultants preferred Assistant Medical Practitioners as interns to the five-year-trained M.B.B.S. graduate. Perhaps the knowledge of their limitations and the need to prove their leadership capabilities gave the Assistant Medical Practitioners a higher level of motivation and dedication. They were also aware that, if they showed a good record of work, the chances were that they would be registered as Medical Practitioners after a ten-year period. Nevertheless the medical graduates and the Assistant Medical Practitioners taken together could still not provide adequate medical care to the entire population.

In 1973, Abeysekera, Chandraraj and Simeonov studied the data concerning Ayurvedic or indigenous practitioners in Sri Lanka, of whom there were 10,806 registered as practitioners; and these authors estimate that the Ayurvedic sector met 70 per cent of the demands of the population. In recognition of this the University of Colombo established an Institute of Ayurvedic Medicine in 1974 and now this institute is a fully fledged faculty. The students were taught basic sciences but the pharmacopoeia was different. From as early as the fifth century B.C. Ayurvedic medicine flourished in Sri

Lanka. Puschmann relates that as early as the fifth century B.C. King Pandukabhaya had a hospital built at his residence and that King Buddhadasa in the fourth century A.D. arranged sanitary organizations for the whole country. Even in colonial times Ayurvedic clinics and hospitals were built. After independence from the British, in 1948, the facilities in these hospitals were extended by every successive government. An Ayurvedic research institute was established as early as 1958. Ayurvedic medicine is firmly established in India and, according to Fendall (1982), the combination of traditional healing and modern medicine appears to be most promising and appropriate solution for health-care problems facing the developing countries.

In spite of the presence of a large number of Ayurvedic practitioners and practitioners of modern medicine there were still many people who had no access to medical care. With the inspiration derived from the Chinese 'barefoot' scheme, a scheme was designed to train young people belonging to a voluntary organization, the Sarvodaya Movement, to work with government health personnel to improve the quality of health in the rural areas. The Sarvodaya Movement is a voluntary organization engaged in trying to improve all aspects of community life, including health-care based on the existing Buddhist philosophy and traditions prevalent in the country. The trainee youths formed a critical human resource who were emotionally committed to bringing about a change in society, and they were selected by the village elders for their motivation, dedication and leadership qualities.

This is a good example of what was recommended by the Fourth Commonwealth Health Ministers' Conference held in Colombo in November 1974:

> The conference recognised that in many instances governments had at their disposal the services of non-governmental organizations, voluntary agencies and private individuals capable of materially supplementing and complementing their own efforts. The co-ordination of activities undertaken by non-official bodies and individuals with official programmes for implementing national health planning objectives would greatly improve the delivery of health care in rural areas . . . and that the community should participate at all levels of the planning and decision-making processes if involved in establishing the rural health delivery system (Commonwealth Secretariat, 1974, pp. 18–19).

Similarly the Director General of the W.H.O., Dr Halfdan Mahler, says that teachers, community workers, social workers, and civic and religious leaders should be involved in health-care. New training programmes must include the teaching of those skills which help individuals and communities to formulate their problems and to choose the right solutions, as well as to promote self-care and self-reliance. Health-education is essential for ensuring appropriate self-care.

The rationale for the Sarvodaya course was that in the rural areas of Sri Lanka there was a dearth of the resources necessary to ensure that the health-care that the people received was efficient. The greatest deficit is in trained

health manpower. The need for health-care in these areas is forever increasing. The situation of great demand in the face of meagre resources had the result that people seek health-care from unqualified practitioners, or resign themselves to traditional home remedies, both of which are often deleterious to health. Four broad units were identified in the youth-training curriculum, and each unit contains a set of objectives, learning experience and evaluation:

First Unit: Curative health to the individual: The trainees learnt how to render initial emergency care to patients and to recognize the common features of infections, malnutrition, symptoms of other diseases and wounds. The common rural belief that devils were the cause of disease was rationalized by showing the people that the bacteria, parasites and small worms under the microscope were the 'devils'. Simple 'structure and functions' lectures on the human body were given with the aid of charts. Demonstrations were given on first aid. The trainees were evaluated by making them demonstrate practical procedures. Simple treatments, of wounds for example, were evaluated.

Second Unit: Preventive health care to the individual: The trainees had to explain how infections are spread. They had to advise individuals on proper disposal of faeces, on personal hygiene, proper storage of food, and water sterilization by boiling. Immunization procedures were taught, and the trainees also had to prepare lectures on health education and nutrition.

Third Unit: Health care to the family unit: The trainees had to advise pregnant mothers and parents about nutrition, give advice regarding immunization and carry out immunization procedures. They also were to advise on methods available for family planning and to collect data on the socio-economic status of, and illnesses in, the family.

Fourth Unit: Health care to the community: The trainees had to work with health teams and investigate outbreaks of illness in the community and identify potential sources of dissemination, collect data, immunize and assist in family planning procedures. They also had to direct the people to National Health Programmes such as campaigns against tuberculosis, malaria or filaria, and to stimulate the community to work for the benefit of the whole rather than that of the individual.

All these units were evaluated by pen and paper and also tested by the demonstration of skills by the trainees.

The main idea behind this scheme was that those who were trained were involved in socio-economic development on a voluntary basis and as such they were highly motivated and dedicated, and relieved the health personnel of their burden. These trainees in turn train people engaged in full-time work in factories, on farms, in various government and private institutions, and in village communities. By this method the people are mobilized to look after their own health at a primary level with very little cost to the government or themselves.

This scheme appears to work well in Sri Lanka which enjoys a literacy rate

of over 90 per cent. The implementation of health care is no longer the prerogative of health ministry personnel. It is the intention to make every citizen a health worker. Modifications of this scheme may be applied to other developing countries and in fact some countries have health-workers trained at this level. The main emphasis is that health must be actively pursued and it can be achieved only with the participation of all the citizens of a country. Health-education, and above all, education as a whole, is vital. In countries where the level of education is high, the health of the people is also good.

It is necessary, therefore, to train several levels of health personnel for curative work and these categories must be able to treat diseases that cannot be controlled or eradicated by health promotion. It is essential that data be collected on the prevalence of disease and on the available personnel to meet these health needs and demands. The total resources in terms of personnel, money and other factors must be correctly ascertained and in order to do this a planning unit is essential. This should be located either in the Ministry of Health or in the Faculty of Medicine to collect epidemiological, sociological and other data and monitor resources, and it should plan for five-year or ten-year projections.

Data necessary to generate educational objectives according to Guilbert (1977, p. 120) are: health needs, demands and resources of society; services to the patient; service to the community; the profession itself; the students; progress in sciences ; and the scientific method. Once these are clearly established it is the duty of those institutions training health personnel to state their institutional objectives clearly so that the competencies and skills of the 'end-product' can be clearly defined; whether this 'end product' is a doctor, dentist, nurse, midwife of of any other health category. According to Guilbert (1977, p. 105):

> The institutional objectives of a faculty of medicine, for example, are, they say, axiomatic: 'We train doctors of international quality. It is not necessary to develop the description any further; medicine is universal.' However, when we try to get the teachers to define a little more fully what they are talking about we see how wide and fundamental the divergencies are as soon as we leave the sphere of generalities. The conflicts between fundamentalists and clinicians, between advocates of preventive and of curative medicine, are the result of those divergencies. This conflict becomes acute during the periodic curriculum reforms.

Institutional objectives have been defined for the Faculty of Medicine in the University of Zimbabwe but unfortunately they are not based on data obtained from epidemiological or sociological data. They have been based on impressions of individual academics. Educational goals are usually defined by using behavioural terms corresponding to the tasks to be accomplished. The

objectives must indicate what the graduates of a given institution should be able to do at the end of their period of training that they were not able to do before. These are also called 'competency objectives'.

Educational objectives are classified by Guilbert (1977, p. 119) as: (1) Institutional; (2) Intermediate (when based on institutional objectives the department draws broad objectives); and (3) Specific (short specific objectives relating to a learning unit). The institutional objectives are drawn up by members of the faculty or the institution and intermediate and specific objectives are drawn up by personnel in each department. Well-constructed institutional objectives are the foundation of a relevant programme. All objectives can be divided according to the sphere of intellectual activity to which they belong: the cognitive domain (knowledge); the psychomotory domain (skills); and the affective domain (attitudes) (Guilbert, p. 152). This classification facilitates an analysis of the learning process and helps teachers to make educational choices. The aim of education is to bring about an expected change in the behaviour of the student in the course of a given period (Guilbert, 1977, p. 207), and the function of the teacher is to facilitate the learning process. The qualities of the specific educational objective are evident when they are relevant, logical, unequivocal, feasible, observable and measurable. Behaviour must be spelt out in terms of verbs of action, such as 'to write', 'to identify', 'to differentiate', 'to solve', 'to list', 'to construct', ' to compare', and 'to contrast'. According to Guilbert (1977, p. 143), 'Relevance is the essential quality of educational objectives. Objectives which have every quality except relevance are potentially dangerous.' Taxonomy is a hierachical classification in a given field, and according to Guilbert (1977, p. 151), 'Taxonomies in the field of education provide a classification of various instructional objectives, at suitable levels, in given spheres.'

In the cognitive domain the taxonomic consists of: (1) recall of facts; (2) interpretation of data; and (3) problem solving. In the psychomotory domain it consists of (1) imitation; (2) control; and (3) automatism. In the affective domain it consists of (1) receiving or attending; (2) responding; (3) internalization-valuing. According to R.F. Mager (as quoted by Guilbert, 1977, p. 171), 'If you give a learner a copy of his learning objectives you may not have to do much else.' As stated earlier, the purpose of teaching is to facilitate learning so that there are interactions between teacher and the student to bring about expected changes in behaviour of the student.

According to Guilbert (1977, p. 208) the purpose of teaching is to help students to: (1) acquire, retain an be able to use knowledge; (2) understand, analyse, synthetize and evaluate; (3) achieve skills; (4) establish habits; and (5) develop attitudes. According to G.E. Miller (as quoted by Guilbert, 1977, p. 210), 'Teaching methods which place the student in an active situation for learning are more likely to be effective than those which do not.' It is the

contention of many academics in many medical schools that the graduates of today do not have the proper attitudes to health and to the care of patients. Faculties of medicine have attempted to change the curriculum in the hope that attitudes would change, but this has not necessarily happened.

There is a great reluctance on the part of medical graduates to work in rural areas; the reasons for this have been mentioned above. The curriculum planner feels that, if medical students are made to spend a good deal of time in rural areas from the first year onwards, a change in attitude may be expected. The premise that medical students are not aware of rural conditions and thus should be subjected to continuous rural exposure is not necessarily true. For example, in Zimbabwe the new curriculum planners hope to send medical students to do 'clinical attachments' in rural hospitals in the hope that the attitude of the Zimbabwe medical graduate would change. Some even claim that medical students enjoy these rural clinical attachments. This may be so for European students who come from urban schools but the rural Zimbabwean medical student may well wish to forget the harsh reality of the environment from which he came. In fact the government of Sri Lanka, in order to help rural students to study medicine, selected the majority of students from rural districts. These were sent to do clinical medicine in rural hospitals in order to bring about correct attitudes. A careful study of these students compared with those from urban districts showed that those from rural districts refused to work in rural hospitals after graduation, and there was no significant difference in attitudes between the two groups. The reasons were obvious. Modern medicine continued to be practised in urban hospitals while the rural hospitals were neglected and without facilities.

Students very often imitate the attitudes of their teachers. In Sri Lanka the clinical teachers did not facilitate learning; they were hardly seen in the teaching hospitals because they were always working in private hospitals and nursing homes. Even when they did come to the teaching hospitals, they paid more attention to those patients who had consulted them privately than those who could not afford to do so. Also, medical consultants and academics live in relative luxury in the cities and students often wish to imitate these life styles. Small wonder then that graduates do not wish to serve in rural areas where they may be forced to lead an almost ascetic life. It is difficult to hide corrupt malpractices adopted by senior doctors; and young doctors in turn became callous and indifferent to their patients. In certain countries, doctors charge their colleagues a fee, proving that in this case, dog can eat dog. When a specialist is consulted the first question he asks is not what the patient's complaint is but what type of medical insurance the patient has. Not all doctors are of this sort and several do not claim their fees from medical insurance for treating other doctors.

I firmly believe, therefore, that not much good would come from rural attachment by medical students unless the teachers change their attitude

towards people and to their own life styles. One often hears of the criteria that are suggested for promotion of a teacher. They include teaching, research and university public service. A teacher may have all these; but, if his attitudes to students and patients are negative, then he is a bad influence on his students. Should not an attempt be made to impart the correct attitudes to teachers? Attitudes are learnt from example and it is the responsibility for the teacher to set that example. A teacher's attitudes depend on a whole host of factors, including a philosophy of his own making, so it is important that not only behavioural science and sociology by taught in the medical curriculum, but philosophy as well. It is worth noting that in countries such as Norway philosophy is a basic qualifying course for undergraduate study; I believe that a moral philosophy is absolutely essential for the happiness of society. Nothing comes to me more clearly than the message of the Buddha for the moulding of attitudes.

The Buddha spoke of the divinity found within oneself; he called this the 'Sathara Brahma Viharana' or the 'Four Divine Qualities'. He explained them as: (1) Metta (Loving Kindness); (2) Karuna (Compassion); (3) Muditha (Altruistic Joy); and (4) Upekkha (Equanimity). Loving kindness, the Buddha said, should be practised by all human beings. One must spread loving kindness to all living beings in the same way one does to one's near and dear. In this way the suffering and pain of others should generate feelings of loving kindness; and, with the establishment of loving kindness, compassion must ensue. When compassion arises one must be motivated to be of service to those in pain or in hunger. When pain and hunger are relieved and when loving kindness and compassion are actively pursued there arises in one the quality of altruistic or selfless joy in the well-being of others. The fourth quality is equanimity which is calmness of mind. This means that one should neither be made ecstatic by being praised nor be made dejected by being blamed.

The Buddha also spoke of group behaviour and enunciated the four principles of group behaviour which he called 'Chatu Vastu Sangraha'. They are: (1) Dane (Sharing or Generosity); (2) Priya Vachana (Pleasant Speech); (3) Artha Charya (Constructive Action); and (4) Samanathvatha (Equality in the Eyes of the Law).

Sharing or generosity is a virtue practised by many people in Buddhist countries. By the act of sharing or generosity one tends to overcome greed: sharing of food, sharing wealth, sharing of ownership of land, sharing of knowledge, sharing of experience and skills and sharing of power. In the materialistic world of today this is difficult to practise. This is the basis of socialism which the Buddha preached 2,600 years ago but which is today practised hardly anywhere. All the trials and tribulations which have occured all over the world have been because of the refusal by some to share power. So sharing and generosity are essential for human happiness.

Pleasant speech is a *sine qua non* for all categories of health personnel. Speech is one of man's greatest evolutionary accomplishments and is a major tool of communication. It is a powerful force that can cause active construction and massive destruction. Everyone likes a pleasantly spoken person and dislikes those who are rude, insolent and vulgar. Speech is used in education and in the moulding of attitudes. Use of 'bad' forms of speech reflects the mental attitude of 'bad' people, while pleasant speech is effective and produces positive attitudes. If one speaks kindly to a person the chances are that the other person will react favourably and positively. Pleasant speech is essential for all categories of teachers of health personnel in order that this positive attitude can become ingrained in all health personnel. When a patient is ill there is no better drug than pleasant speech. Talking ill of people should be avoided.

Constructive action is preferable to destructive action. Many people waste time chatting and gossiping and it has been estimated that 80 per cent of time in a conversation between people is spent on speaking ill about someone who is not present. Because of inferiority or fear of non-recognition people often belittle ideas or actions of other people by devious schemes. This is not conducive to harmonious living. Only when one's daily actions bring about peace and happiness to others could these be acknowledged as constructive action. To act together, in unison, for the betterment of many, the Buddha says, is constructive action.

Equality in the eyes of the law is something that must be stressed. If there is a law in a group or in a society then that law must apply equally from the highest to the lowest in that group or society. In some societies laws exist only for the menials and not for those who are responsible for drafting the law. The flouting of equality in the eyes of the law has led to corruption, strife and nepotism in the so called emergent nations of the Third World. The adherence of a society to real equality gives tremendous confidence to all members of the group.

Attitudes are often moulded by influential people in a society, especially politicians. A form of behaviour exhibited by a powerful group in a society is often imitated by others. If the behaviour imitated is wholesome then it has a wholesome effect on society. Similarly, the attitudes of the doctor may be moulded by the attitude of politicians and transformed to the medicine practised by them. If the politicians have confidence in the local doctors, with special emphasis on rural medicine, then the whole country would have faith in the new system. If the politicians have confidence in the local doctors, with special emphasis on rural medicine, then the whole country would have faith in the new system. If the politician seeks treatment in a Western country then the morale of the rural medicine scheme would fail, especially if the treatment were for a condition that could have very well been treated in his own country.

No wonder that so many doctors migrate from developing countries to places that practise esoteric medicine, in spite of the great emphasis given to rural medicine in their own curriculum.

The attitude of teachers is of paramount importance in imparting correct attitudes to students. Teachers must not only be highly trained in their speciality but also be aware of and conversant with new methods in educational technology.

Attempts have been made to evaluate the qualities of a teacher. In some instances this is done by peers which is entirely a subjective assessment. Student evaluation of teachers has been adopted in some universities but here again there is personal bias and extremely subjective judgement. If the teacher is to facilitate learning and learning is a change of behaviour of the student, this could be evaluated by more objective methods. The teacher could draw up a set of behavioural objectives that students are expected to accomplish in a given course. The students could then be pretested and their behaviour assessed; the teacher then undertakes the segment of learning either by lectures, tutorials, demonstrations and practical classes. At the end of the learning segment the students are subjected to a post-test. From the difference in standard scores between the post-test and the pre-test it is possible to evaluate the teaching competence of the teacher in an objective manner.

Evaluation or testing is a measurement to find out the change of behaviour in a learning situation. Two types of student evaluation are available: (i) formative or diagnostic evaluation; and (ii) summative or certifying evaluation. The aim of formative evaluation is to inform the student on the amount of learning he has achieved and is not used as a certification process. Summative evaluation is a decision by which a student would end a unit or course or pass to the following year. The aim of evaluation is to provide feedback to the student and the teacher and for protection of society. According to Guilbert (1977, p.335) there should be validity, reliability, objectivity and relevance. Validity is the degree of accuracy with which the instrument measures what it is constructed to measure. Reliability is the consistency with which an instrument measures a given variable. Objectivity is the degree of concordance between the judgements of independent and competent examiners as to what constitutes a good answer to each of the elements of a measuring instrument. Relevance is the extent to which criteria, established for selecting questions so that they conform to the aims of the measuring instrument, are respected.

The methods of evaluation available in medical education consist of written papers, practical tests, clinical assessment and orals. The qualities of a test should be directly related to educational objectives, realistic and practical, important and useful, complete but brief, and precise and clear. There are

several types of written examination: essays, short open-answer questions, true/false items, and multiple-choice questions. Practical tests could be conducted to test psychomotor skills such as the ability to do a blood count, perform a test for cranial nerves and do spot or recognition tests. In clinical tests, attitudes could also be evaluated, such as the relationship with, and the method of examining a patient. Oral examinations are a common feature in medical schools that follow the British tradition. I wish to dwell a little on this as there are conflicting opinions regarding the use of the oral in evaluation. The advantages are that it:

provides personal contact with the candidate;
has flexibility in assessment as the examiner can vary questions depending on the responses received;
makes it possible to question the student as to how he arrived at the answer; and
allows two examiners to assess the student at the same time.

The disadvantages of the oral are that it:

lacks standardization;
lacks objectivity;
carries the possibility of abuse of the personal contact;
lacks adequately trained staff to administer the examination; and
is excessively expensive in professional time in relation to the information it yields.

In most enlightened medical schools the weightage given to the oral is extremely low.

Another important aspect of medical education is not to overemphasize the importance of one's own subject or discipline. For instance, Anatomy cannot be taught in isolation from other disciplines. Anatomy is but a mere cog in the machine of medical education. The purpose of Anatomy is to provide a scientific basis in the understanding of clinical medicine and its application. It must cater to the requirements of clinical medicine and it is imperative that the clinical disciplines must lucidly state what their objectives are. It is only then that the pre-clinical disciplines can provide any meaningful instruction in the medical curriculum. Carefully planned integrated or co-ordinated courses must be drawn up to cater to the needs of the clinical disciplines. In this way unnecessary and time-consuming duplication can be avoided.

In summary then, it is re-emphasized that health-care must essentially be preventive in its objective, and must necessarily be considered and implemented as a multi-component team-effort by all sectors of the economy — not excluding the direct involvement of the people themselves.

Unless and until all the required imputs, attitudes and disciplines are integrated with this effort 'All for Health' health-care will remain an elusive goal and medical education only a lop-sided and ineffective means of training.

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