

BACKGROUND PAPER VIII

XV ANNUAL MEET OF MEDICO FRIEND CIRCLE

THE TECHNOLOGY OF MEDICINE

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I have chosen this occasion for sharing some of my concerns about the direction which the so-called modern system of medicine is taking in our country. I must confess that I am witnessing this scene with an increasing degree of despair.

I am not referring to the many distortions and unethical practices which have crept into our profession. There has been a general decline in the moral values of our entire societal fabric and it would be unrealistic to expect that the medical profession could have remained untouched in this pervasive environment. This is in no way a defence or an apology for what is going on. I do believe that our profession is such that it would be wrong for it to emulate the greed of our consumer culture and it should be the duty of our professional bodies to restore the respect with which the healing profession was treated by the society in the past.

My concern, at present, is with something different. It relates to our understanding, at a conceptual level, of what constitutes the technology of medicine and about technological choices in a developing country such as ours. Some of the spectacular achievements of the so-called science-fiction medicine in the west have made us, the inheritors of the western tradition, rather proud and arrogant. We have deluded ourselves into believing that the use of hitech in medicine is a very scientific system of medicine. This has already led, and is rapidly leading almost at an exponential rate, to make medical treatment increasingly expensive and so out of reach of the common man. Furthermore, we have become increasingly intolerant of systems of health management which have not emerged from the west.

Frankly, I always feel a little uneasy when a claim is laid that modern medicine has a strong scientific base and it has already achieved a high-technology status. It seems to me that the use of expensive and complicated gadgetry in medicine is being equated with sophistication and good science. One can, with good reason, question these basic assumptions. It is only very recently, perhaps since the last century, that a scientific approach in medicine was initiated and this has resulted, indeed, in some quite remarkable and impressive achievements. Our understanding of vitamin-deficiency diseases, some common endocrinal disorders and controlling many formerly lethal bacterial infections are some such examples. But a careful retrospective medical audit should make us a little more humble and less extravagant in attributing the improvement in the so-called health indicators- infantile mortality, life expectancy etc - to purely medical interventions. And there are a whole lot of common ailments, you would agree, whose mechanisms we have not yet understood and which therefore necessarily have to be treated rather empirically.

One can reel off examples after examples where we have quite unjustifiably credited many improvements to purely medical intervention with little justification. Let me remind you of some. The annual death rate from respiratory tuberculosis in the state of New York was an appalling 700 per 10,000 population in 1812. By 1882, when Robert Koch discovered the tubercle bacillus, the annual deaths per 10,000 population from this disease had already come down to 370. Surely, merely discovering the germ could not be credited with this fall. In 1910, before the first T.B. sanatorium was opened in U.S.A., and after all its benefits could be attributed to such generalities as rest

already dropped to 180. By 1946, when streptomycin, the first effective drug which could act on the tubercle bacillus was made available, the death rate had come down to 48.

In other words, a decline from 700 deaths in 1882 to 48 in 1946 - an almost fifteen fold drop - had been achieved before we were able to develop the first effective drug against tubercle bacillus. So what are we taking the credit for? The reasons for this improvement can really be attributed to social and economic factors.

We must not also overlook the fact that bacteria and viruses have also had their own biological ups and downs. Why is leprosy, which was once widely prevalent in Europe - and accounts of leper colonies outside town limits can be encountered in numerous books dealing with medieval Europe - not seen there at all? Why has plague, which was such a scourge in our own country within living memory, now seldom talked about? Where have scarlet fever, or erysipelas or for that matter, syphilis which so dominated the undergraduate curriculum of my own student days, gone? I think it is necessary to pause and reflect on some of these phenomenon before hastily tying up all such improvements to our own interventions. Drawing such conclusions is unscientific. Scepticism, on the other hand, is one of the hallmarks of good science.

Let us also not forget that modern medicine itself has become a disease producing agent, sometimes of a most virulent kind. The entire gamut of iatrogenic diseases needs to be debited from our account of achievements. I would not dwell on this point, but a mention does need to be made about this pathogenic role of medical intervention. I could not better the statement by Carl Sandburg, who wryly commented after an illness, "I took so much medicine that I was ill for a long time after I got well".

While I hold no brief for all that is practised under the broad category of traditional or even 'folk' medicine, I am clear that, by and large, most medicine, even as it is being practised today in the affluent societies of the west, also remains largely empirical. The external facade of modern medicine does overwhelm us; the inside contents have so far remained rather weak and tentative. What a family doctor or a general practitioner was supposed to do in the past, with very little technological backup, a modern hospital is attempting to replace, by making use of overchanging and more impressive gadgetries. This has resulted in a very expensive system of health care. The increasing use of electronic digital display systems, which often throw us off-balance by figures which claim to be accurate to the fourth decimal point, are not merely deluding us into a totally misplaced faith in the great accuracy of our observations, a fallacy which has been and needs to be repeatedly remembered, but much more importantly, such systems by themselves, do not help in the conceptual understanding of disease processes. I need hardly remind you that using an electronic blood pressure instrument does not make for a better understanding of hypertension than the old fashioned mercury manometer. But, and here lies the catch, so enchanted and pre-occupied we become with the visual impact of what we see, that we are diverted from our primary endeavour of reflecting on the basic phenomenon of health and disease. Enter an operating room where an open-heart surgery is being performed. The scenario, with oscilloscopes, the heart lung machine, and all other technological gadgetries literally sweeps us off our feet. We get so caught in this drama that we almost stop thinking about the basic issues which lead to such interventions.

Medicine, as a science, is very young indeed. This is a view not held by a small man like me but of some of our profound medical thinkers - Rene Dubos or Lewis Thomas. Lewis Thomas, who heads the prestigious Sloane-Kettering Institute of Cancer Research in New York, and who has been sharing his deep understanding of complex biological phenomenon, written in inimitable and lyrical prose in his periodic essays in the New England Journal of Medicine has recently come out with his autobiography where he, the son of a New York general practitioner, scans the development of medicine from the time he accompanied, as a child, his father on his daily home visits in the early years of this century to the present scenario. The title of his book "The Youngest Science - Notes of a Medicine Watcher" is revealing and underscores the point I am making. I recommend its reading as a chastening reminder of our fallibility and limitations.

The Non-Technological Functions of Medicine:

It is rather humbling to realize, though one need not be apologetic about the fact, that some of the most valuable components in the art of healing still remain, and hopefully would continue to remain, non-technological. This is the 'supportive' role which healers have always been called upon to perform. This is what providing comfort and reassurance is all about. The actual methodology used has little to do with the casual mechanisms of disease and while some may argue that this role perpetuates superstition and often obstructs progress, it cannot be denied that this supportive role is a very important and a necessary function of medicine all the same. Call it 'placebo effect' if you like or invoke the induction of endorphins to explain and legitimize its success in a painful situation, its value cannot be denied. In fact, a lot of research in medicine ultimately leads to finding a legitimate explanation for practices which our forerunners had found to be useful mainly as a result of accurate observation and correlation.

It is in this context that one has to understand and respect the beliefs and culture of different societies and not reject traditional healing methods as outright quackery. It seems rather unreasonable to force the belief system of a western society into very different, but in no sense inferior belief systems of say, eastern societies.

During the last decade or so, a very significant realization by scientists who are working at the frontiers of medicine and physiology is taking place. This has to do with the "Mind-Body" relationship. The Nobel neurophysiologist, Roger Sperry, has demonstrated that thought changes matter and has called for the recognition of such "top-down" processes. He has shown that perceived meanings are translated into actual bodily changes. These "top-down" influences are contrasted with the usual "bottom-up" processes which are assumed in medicine to be the only ways in which physiology can be affected.

Whether it is the recognition of the role of Type A personality in heart disease or blood cholesterol levels, the influence of meditation on hypertension or cardiac arrhythmias, the new discipline of "psychoneuro-immunology" where fluxes of neurotransmitters affect neural input to lymphoid tissue, they all point to a new appreciation of an ancient insight: Mind and body are not entirely separate entities, and thought is a potent force in the world of the body. And so the meanings we take from our world-view cannot be ignored as factors in the equations of illness. We have so far paid only lip service to the "soil and seed" concept and concentrated mainly on the seed component. Soil has never got the importance it deserves because

These bits of information provide a new legitimacy to the so-called non-technological functions of medicine.

A very careful and honest heart searching is necessary by advocates of modern, institutional system of health care to analyse how much of their success depends on a totally non-technological intervention. Once this intellectual cob-web is removed, a restructuring can lead to a more humane, less expensive and a socially just system of health care.

WHAT IS HIGH TECHNOLOGY MEDICINE ?

The examples which are often cited of the spectacular advances in medicine - organ transplants, coronary bypass surgery, joint replacement surgery - really stem from the fact that we have not understood the basic causal mechanisms of most diseases. We do not know why coronary arteries get choked, why kidneys fail, what causes rheumatoid arthritis which may ultimately lead to joint destruction necessitating their replacement, or indeed why cancer occurs. We deal with the aftermaths and so we resort to some very expensive technical interventions which are really fire-fighting methods. If we understood the basic causes of these diseases, such expensive methods would not be needed.

The converse is also true. Whenever one has to resort to very expensive systems of treatment one can safely assume that we have not fully understood the basic disease process.

How then can one label such interventions as high-technology medicine? In fact, this level of technology is, by its nature, at the same time highly sophisticated and profoundly primitive. It is true that the individual instruments or machines may use some of the latest ideas in basic sciences or applied engineering technology, but as far as medicine is concerned these machines do not unravel the mysteries of disease. I think we are all the time equating such technology transfers from other disciplines with high science medicine. I would categorize such interventions as "half-way technology".

The true "high-technology" medicine, to my way of thinking, is where the basic disease processes have been unravelled and then treatment quickly becomes simple, inexpensive and effective. It is so effective that it seems to attract the least public notice; it has come to be taken for granted. But this is the genuinely decisive technology of modern medicine, responsible for some of our great achievements.

Let us distinguish, therefore, between half-way technology versus high science medicine. The former is impressive but expensive and does nothing to the disease process per se: the latter is disarmingly simple, much less expensive and directly affects the disease.

Of course a lot of expenses may be incurred in research work which ultimately leads to a more fundamental understanding of various issues which lead to or influence the disease mechanisms. Modern research is not an inexpensive business but if I have to use scarce resources for health care, this is where I would put my money. Also, it is worth reiterating that the crucial instrument needed for such work is an incisive intellect which is capable of raising the right kind of questions. What we need to support and encourage is the creation of an environment where some fearless and pointed questions can be raised without the risk of being smothered by some powerful lobbies representing the interests of the medical-industrial complex.

TECHNOLOGICAL CHOICES IN DEVELOPING COUNTRIES -THE TECHNOLOGY FILTER

It has been repeated, ad nauseum, that there is a very intimate relationship between technology and society, each influencing the other. What is often overlooked, however, is the peculiar stratified societal structure of developing countries with a top ten percent of elite who are represented by the urban, affluent class and a bottom ninety percent of poor urban or rural masses. The top ten percent wield political power and are the decision makers; the bottom ninety percent do not matter.

The top ten percent, many of whom have imbibed the life style, the culture and the value systems of the west, look to the advanced countries and want that their country should have the same kind of medical facilities as are available in the west. Being the decision makers, they exercise control over what Prof. Amulya Reddy calls a "technology-filter" - a filter through which societal needs have to pass to create a technology demand. This filter allows only the needs of the ten percent elite to pass to our technology and research institutions which in turn look to the west for their inspiration. The needs of the bottom ninety percent are constantly ignored or shelved. Thus we get into a dilemma. Even if we learn to distinguish between the high visibility, expensive half-way technologies of dubious value, from real high-tech medicine, the decision makers would always favour half-way technologies, becoming a victim of some high pressure sales campaign by the medical-industrial complex of the west which treats health care as a market commodity. And so we witness our scant resources being frittered away in having our hospitals being increasingly equipped with gadgetry such as CAT scans, intensive care units, linear accelerators, NMR's etc. These have impressive symbolic-value as opposed to use-value.

It is obvious that this technology filter keeps on widening the gap between the elite and the masses and ends up with a basically amoral system which leads to inequity. Ivan Illich, one of the most incisive intellects today, while discussing the much debated energy crisis in our world, brought out a very perceptive point. The greater the energy consumption, he said, the greater the inequity amongst men. Citing the example from transportation, he says: "Tell me with what velocity you move, and I will tell you who you are".

What Illich illustrated in his example of transportation, is equally valid for the present day health care system.

NEEDED - A HUMANE TECHNOLOGY

When we realize that health care is a very complex business, where non-medical interventions also play a crucial role (adequate nutrition, clean drinking water, clean environment, prevention of overcrowding etc.) and where the human function of caring, empathy, family support are important, one can appreciate that the health (or disease) caring system should be in harmony with the general philosophy of life followed by any society. There cannot be a universally applicable technology which would suit all cultures and equally, with changing societal structures, there has to be an ongoing updating of what, in our classification, is the non-technological function of medicine. Why should hospitals or old people's homes take over the functions of what a family can and still provides in the under-developed world? Such family roles, considered impractical in industrially advanced countries, should be carefully nursed and encouraged.

This requires a demystification of professional knowledge, Information should be shared with people. Raj Arole, David Werner, Zafrullah Chowdhary, Prawase Wasi, each of them, in their own ways have shown how medical care and a healthy life style can be taught to ordinary people.

The present information sharing between the providers of health care, i.e. us, and the consumers of our services - the patients and their family, is asymmetric. We either do not realize the value of such information sharing, or we do not have the time and skills for such work. Our education in an alien language has removed us from the mainstream of our people and this has imposed a barrier to mutual communication and understanding. We do not understand the idiom and the nuances of the language of our common people and they, in turn, are bewildered by our phrasology. We may talk of germs, while they have visions of spirits or demons. We then view them as an ignorant and stupid lot. I wonder whom to pity. The fact that we do not understand our own past, our dreams, our superstitions and our belief systems surely is a severe handicap. At least let us realize that we have this handicap. But even this realization is missing.

Of course, there is the everpresent urge to create a mystique around us and our knowledge which gives us such power. Thus there is a vested interest in withholding information from others. This is a common attribute to all professions where sharing of knowledge with others is supposed to lower our market value. But then, this leads to a totally different aspect about what Illich called "The Disabling Professions". I would not dwell on this issue, pertinent though it is.

There is an increasing realization that we have created a very mechanistic model of health and disease. We have been overinfluenced by Descarte's vision of human body as a mere machine and by Koch's postulates. This approach has worked well in what one may label as unifactorial diseases. It is unlikely that such concepts would be equally valid for multifactorial illnesses.

While Koch's postulates served a very useful purpose in a limited number of diseases, it has little relevance in multifactorial illnesses. And so one should be able to postulate new theories which can make for better understanding. This is a phenomenon which is so characteristic of a scientific approach. Nothing is infallible in science. Newtonian mechanics had to give way to quantum mechanics, to the theory of relativity, to Heisenberg's law of uncertainty and so on. In fact, Karl Popper, the great philosopher of science, has recently reminded us that the major feature of science is its idea of falsifiability. There is nothing like absolute truth. While this is an accepted mode of thinking in subjects like physics or chemistry, we medical people do become rather dogmatic. Indeed, someone has been compelled to visualize our large hospitals as medical churches.

We need to understand this clearly and so we have to break out of the restrictive confines of the medical workshop which is what a hospital is. We do need such workshops but they need not overwhelm us. In our race for emulating the west, we are losing the great tradition of empathy and human understanding which are so valuable to the recovery process in a person who is sick. The status and the role of a family doctor needs to be revived, with the family members contributing significantly provided we share information with them intelligently. I believe that informed self-care should be the main goal of any health programme or activity. Ordinary people, provided with clear, simple information can prevent and treat most common health problems in their own homes - earlier, cheaper and often better than doctors. People with little formal education can be trusted

as much as those with a lot. And they are just as smart. Basic health care should not be delivered, but encouraged. This requires a degree of sophistication in communication technology which is missing altogether from our formally trained professional structure. Lacking this, we lose a very powerful support system which can be readily provided by our patients and their families. Instead of treating them as nuisances, we have to invite them to participate in something which deeply concerns them. Here again, let us not repeat the same mistake and fall for expensive communication gadgetry. What is important is the software, and not the hardware. This calls for the medical profession trying to understand our societal structure, the ways of thinking of our people, the social and economic injustice our common people are subject to, their language and idiom. An insight into those areas converts a clever physician into a wise physician. I very deliberately make this distinction between smartness and wisdom. Please look around and try to locate this class of wise people. They are becoming an endangered species and would soon be extinct.

Such a technology of medicine which is more appropriate, more humane, more philosophical, more scientific, less expensive and therefore more equitable, more harmonious with our belief systems but without any place for superstitions and quackery and which augments autonomous coping with illness or death rather than a passive, indifferent and expensive caring available in our institutional systems, is what we should try to develop.

Please do not imagine that I am advocating a return to something "Swadeshi" in a romantic or fundamentalist manner, I am pleading for more science, more rationality and more realism in handling our own problems. I am also aware that it requires hard work and would meet with stiff opposition from vested interests from within the profession, from the elite of our society and from the sellers of technological gadgetries. But I have seen such examples in various remarkable attempts in different parts of the developing world. I have personally experienced this during some of my own work and hence I have reason to end with an optimistic note.

Nothing worthwhile is achieved without hard work and sacrifice. But hopefully, it would make the life of our patients easier. "Patient care", remember, is "caring for the patient". After all, this remains the entire purpose of our existence.

REFERENCES

1. ARÓLE, M. and ARÓLE, R. : A comprehensive Rural Health Project in Jarkhed. In NEWELL, K.W. : Health by the people. World Health Organization, Geneva, 1975.
2. ATTINGER, R.O. : High Technology: The pendulum must swing back. World Health Forum. Lead Article Vol.8 No.3 1987 (To be published).
3. CHOENL, Y, ZAVARZALAF : Basic Service Delivery in Under-Developing Countries : A view from Gomashasthaya Kendra in READINGS ON POVERTY AND DEVELOPMENT - Ed. Bhasin, K. and Vimala, R. F.A.O. Rome, 1980.
4. CARLSON, RICK : The End of Medicine, Wiley Interscience, New York, 1975.

5. COUSINS, NORMAN : Anatomy of an Illness. W.W.Norton & Co. Inc. New York, 1979.
6. EHRENREICH, JOHN : The Cultural Crisis of Modern Medicine, Monthly Review Press, New York, 1978.
7. ILLICH, IVAN : Medical Nemesis, Random House, New York, 1976.
8. JORDAN, BRIGITTE : High Technology : The case of Obstetries. World Health Forum. Lead Article Vol.8 No.3 1987 (To be published).
9. REDDY, A.K.N. : Technology and Society. Lecture in Rural Technology Course ASTRA, Indian Institute of Science, Bangalore, 1982.
10. THOMAS, LEWIS : The Youngest Science - Notes of a Medicine Watcher, Bantam Edition. The Viking Press. New York, 1984.
11. TAYLOR, RICHARD : Medicine out of Control. Sun Books, Melbourne, 1979.
12. WASI, PRAWASE : Personal Communication Ramon Magsaysay Award, Manila, 1981.
13. WERNER, DAVID : Where There is No Doctor. The Hasperian Foundation, Pao Alto, California, 1977.
14. DOSSEY, LARRY : Meaning and Medicine; Future Directions - Paper written for the Theosophy Science Study Group of India, 1987.
