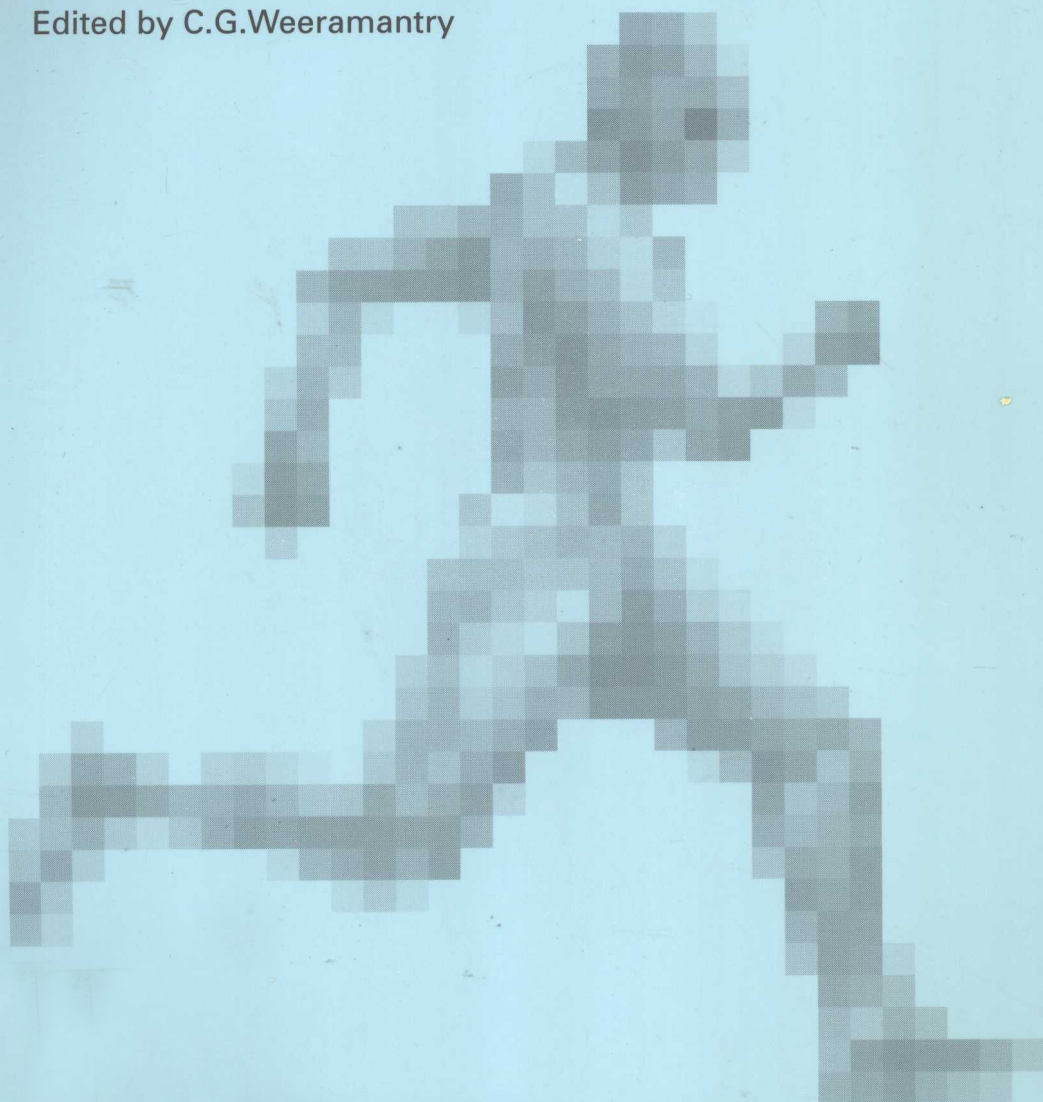# The Impact of Technology on Human Rights

Global Case-studies

Edited by C.G. Weeramantry

The Impact of Technology on Human Rights: Global Case-studies

Studies on the affirmative use of science and technology for the furtherance of human rights, commissioned as a special project by the United Nations University, following a reference to the University by the United Nations Human Rights Commission

Edited by C.G. Weeramantry

**United Nations
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Foreword

This is a sequel to *Human Rights and Scientific and Technological Development* (UNU Press, 1990) and takes the studies further – from the generic to the specific – by exploring, through case-studies, the impacts of scientific and technological developments on human rights. The contributions by Aart Hendriks and Manfred Nowak (the Netherlands), Vitit Muntarbhorn (Thailand), Pawel Bozyk (Poland), Edgardo Lander (Venezuela), and Tewolde Berhan Gebre Egziabher (Ethiopia) touch on the complex relationship between human rights on the one hand and agricultural and industrial technology, biomedical technology, firearms technology, and the economic impact of technology on the other. They all stress the importance of technology for self-reliance and utilization of its advances to supplement rather than supplant traditional technologies, as well as a careful consideration of the potential and unintended implications for human rights. These case-studies will offer new grounds and avenues for furthering theories and promoting practical policy recommendations in the area of science, technology, and human rights.

Professor C.G. Weeramantry, who served as editor of the first volume, continued to coordinate the research and edit the results included in the present volume. In 1990 he was elected a judge of the International Court of Justice in the Hague. We wish to congratulate him on his election to this important international position and express our heartfelt gratitude for his excellent and dedicated work as editor of this volume.

We are happy to record with appreciation the support provided for the project by the Ministry of Foreign Affairs of the Government of Japan. We are also grateful to the UN Centre for Human Rights for its encouragement and cooperation in undertaking the research.

Roland J. Fuchs
Vice-Rector
The United Nations University

Introduction

C. G. WEERAMANTRY

The spectacular advances in science and technology that have continued un-abated throughout the 1980s have emphasized the urgency of the problems considered in this volume. With every step forward in science and technology, the power of these forces to affect human society for better or for worse has increased. The power of science and technology at the time of the appearance of this volume is greater than it was when the previous volume in this series appeared two years ago. With every passing year that power will increase and the need to use it in the interest of human rights will grow correspondingly more urgent. Since this task grows more difficult by the day, it is right that we bring to it a sense of compelling urgency.

Moreover, just as the power of science and technology keeps growing, the problems we are addressing tend to worsen. For example, given that the right to food and a pure environment is a recognized human right, the problems facing us today at the beginning of the 1990s are far more acute than they were in the early 1980s. To quote the Bellagio Declaration on Overcoming Hunger in the 1990s:[1]

We have only imprecise numbers to take measure of the hungry, but those numbers tell us that: (1) a billion people live in households too poor to obtain the food they need for work; (2) half of these are too poor even to obtain the food they need to maintain activity; (3) one child in six is born underweight and one in three is underweight by age 5; and (4) hundreds of millions of people suffer from anaemia, goitre, and impaired sight from diets with too little iron, iodine or vitamin A. In a world of potential food plenty, we have collectively failed more than one billion of our people.

The urgency thus grows on two fronts – the scientific and the practical – and in combination these two factors produce an exponential growth in the urgency and the magnitude of the problem.

A world that has moved from the concept of the mere coexistence of nations to that of active cooperation among them for the betterment of the human con-

dition can no longer ignore the problem. In the words of Javier Pérez de Cuéllar, former Secretary-General of the United Nations:

One of the great challenges of the new era is to realize the possibilities of genuine co-operation to the maximum extent that the world's resources and capabilities will permit. Lasting peace will necessarily require an improvement in the human condition. This, in time, can only be achieved through productive patterns of interaction among all members of the international community.[2]

Science and technology offer the opportunity *par excellence* for generating "productive patterns of interaction among all members of the international community." Human rights is a vital field of attention in the drive to improve the human condition. Such an improvement is, as the Secretary-General observes, a prerequisite for lasting peace. The studies in this volume, therefore, contribute some perspectives to a problem as important as that of global peace, for we see all around us the spectre of desperate and destabilizing denials of human rights, in the midst of a growing scientific and technological capability to eliminate some of their root causes. These studies come at an opportune moment in history, when scientific and technological capability has grown to unprecedented proportions, and further delay can only be indulged in at the cost of lasting damage to the future of the race.

In addressing a problem as immense as that of the interaction between science and technology and human rights, we have had to be selective. Our scheme has been to select one or more aspects of technology that are of special relevance to a particular geographical region and to make a study of their impact on one country within that region. Thus we have a series of studies on a number of subjects, all of which are of immediate interest to vast sectors of the global population.

The areas covered include: agricultural technology (Professor Vitit Muntarbhorn of Thailand); industrial technology (Dr Bozyk of the Nowa Huta industrial complex in Poland); biomedical technology (Mr Hendriks and Professor Nowak of the Netherlands Institute of Human Rights); firearms technology (Professor Egziabher and others from Ethiopia); the economic impact of technology (Dr Lander of Venezuela); and a conceptual study of scientific technology and human rights by Dr Jan Berting of the Netherlands.

Although these studies concentrate on particular areas, they all yield valuable insights across a wide spectrum of activities pertinent to the impact of technology on human rights. Nor is their importance confined to one country or region, for many of the conclusions reached are applicable to countries with economies or social backgrounds similar to those investigated. Indeed, the conclusions from some studies are almost universally applicable.

Thus Dr Berting's conceptual study of technology and human rights is universal in its outlook, and places in perspective the numerous practical and conceptual problems that occur at the interface where modern technology impinges on the body of human rights norms that are now part of the human heritage.

Dr Lander's study of the experience of Venezuela as a South American oil-producing nation has relevance not only to other countries in South America, but also to other countries in the Middle East and elsewhere. Similarly, Professor Muntarbhorn's description of the impact of technology on Thai agriculture would be applicable in large measure to most countries in South and South-East Asia, subject to modifications necessitated by the local context. They may also afford relevant insights for many countries on the African continent, and in general for developing countries, newly industrialized countries, or countries approaching that status. The examination by Dr Egziabher of firearms technology and its profound impact upon all aspects of Ethiopian social and political life has implications for all countries, especially in the developing world.

The study of biomedical technologies by Hendriks and Nowak is a pointer to the sort of problems all countries could face in the future, when sophisticated biomedical technologies spread over the whole globe, as they are already in the process of doing. Dr Bozyk's study of the problems attendant on the massive and sudden introduction of industrial technology into a society has widespread relevance at a time when so many countries are looking to this course as a way out of their economic problems.

The impact of technology has ranged from the peaceful penetration of useful technologies to what Dr Egziabher has described as the "violent entry"of destruction technologies. In all this, the impact upon lifestyles that have been maintained for centuries, if not millenia, has been profound and widespread.

To hark back to the genesis of this project, a growing awareness of the problems at the interface between the expanding domains of technology and human rights prompted the General Assembly of the United Nations to proclaim in 1975 its Declaration on the Use of Scientific and Technological Progress in the Interests of Peace for the Benefit of Mankind (Resolution 3384 (XXX) of 10 November 1975). This Declaration called upon all states to take appropriate measures to prevent the use of scientific and technological developments to limit or interfere with the enjoyment of human rights and fundamental freedoms of the individual as enshrined in the Universal Declaration of Human Rights, the International Covenants on Human Rights, and other relevant international documents.

That same Declaration called upon all states to cooperate in the establishment, strengthening, and development of the scientific and technological capacity of developing countries with a view to accelerating the realization of the social and economic rights of the peoples of those countries.

A decade later, Resolution 1988/9 of the Commission on Human Rights dealt with the use of scientific and technological developments for the promotion and protection of human rights and fundamental freedoms. It invited the United Nations University, in cooperation with other interested academic and research institutions, to study both the positive and negative impacts of scientific and technological development on human rights and fundamental freedoms, and expressed the hope that the United Nations University would inform the Commission on Human Rights of the results of its study.

Pursuant to that resolution, such a study was undertaken, of which this volume is a part. The preceding volume in the series explored many of the conceptual aspects of this problem, as compared with the present volume, which explores its practical and specific aspects with reference to a representative selection of countries and regions.

Readers interested in the history of United Nations approaches to human rights and scientific and technological developments will find these outlined and commented upon in Sadako Ogata's Introduction to the first volume.

Yo Kubota and Hiroko Yamane pursued this further in chapters on the institutional response (chap. 6) and the normative response (chap. 7), where the reader will find details of the various resolutions, declarations, studies and reports in this field, along with relevant aspects of national legislation. These chapters also draw attention to the specific human rights that are particularly affected by scientific and technological progress.

Conceptual overviews were supplied in part 2 of that volume by Professors Amilcar Herrera, Saneh Chamarik, and Tom J. Farer.

Some specific issues were treated in depth in the later chapter. While the present editor dealt with human rights and development (chap. 8), Vid Vukasovic discussed human rights and environmental issues (chap. 9). Shigeru Nakayama contributed a vital chapter on the structure of the scientific enterprise.

The volume closed with a number of suggestions and recommendations (chap. 10), dealing with both conceptual advances and new institutional structures. Among the problems identified were lack of participation in scientific and technological decision-making, inaccessibility and maldistribution of information, and the need to change the view that technological development in the developing world is a dependent variable of what happens in the advanced countries. The need to develop technological self-reliance and to use new technology to supplement rather than supplant traditional technologies was stressed. The studies emphasized three principal elements involved in using technology for purposes beneficial to developing societies: their participation in the process of decision-making; their contribution to the technology itself; and their enjoyment of that technology, in the sense that it reaches and benefits the bulk of the people in a given society rather than a select few. It also emerged from those studies that a vital need was the training of personnel who were attuned to the problems and who would implement at all levels the procedures and purposes outlined.

The present volume takes these studies further, from the general to the specific, by exploring, in the context of specific countries, selected areas of science and technology in greater depth. It thus offers a series of practical studies as a sequel to the theoretical discussions in the previous volume. Together these studies provide a firm theoretical and practical foundation for such further research and practical projects as may be considered necessary.

There follows a brief résumé of the contributions contained in this volume.

Jan Berting's analysis covers the interactions between technology and society

in three areas: technology viewed as sets of physical objects, technology in the sense of know-how, and technology in the sense of the theory of the application of technology. In this latter category "software" is stressed, in contrast to the "hardware" aspects which predominate in the first two meanings. In the area of this third category we see the rise of a new intellectual technology adapted to the handling of large and complex organizations and systems.

The Berting analysis places the continuing impact of science and technology on society in the historical context of the Judaeo-Christian tradition, with its emphasis on the power of man over nature. This impact is traced through to the Industrial Revolution and the Age of Enlightenment. These historical factors combine to produce various models of development, one of which is the deterministic model in which science and technology determine the course of their own development and society adapts itself to these forces, over which it has little control. A significant part of Berting's analysis is devoted to ways in which this deterministic model can be "deconstructed." He warns us that deterministic and related models are very resistant to theoretical attacks, and that the path from the deterministic model to the voluntaristic one is narrow and difficult. Education is a major element in this process, for people need to be aware of the consequences of deterministic models of development.

There is also a fascinating analysis of the movement "upstream" and "downstream" of scientific influences; this considers the movement of science and technology from its originators to its consumers.

Such an analysis revives also the discussion in volume 1 by Nakayama of the "rights of the ignorant" and the need for another kind of enlightenment by which the public who are the consumers of technology would have the right not to be disadvantaged by their ignorance – a matter acquiring increasing importance owing to the complexity of modern technology, which places it well beyond the comprehension of most of its consumers. This will lead to a better understanding of problems of choice in relation to technology, rather than to an attitude of passive submission to both the course that technology will take and the will of "upstream" interest groups.

The study also gives us an understanding of the reasons why the deterministic model is so well entrenched. This model devotes itself not merely to the selection and adoption of the best technology, but concentrates also on the best type of organization of the production process. The logic of this model forces social life to adapt to its needs and dooms to extinction any social or cultural traditions that stand in its way.

This vital aspect of the interaction between technological development and human rights must receive concerned attention if technology is to be used consciously for the betterment of society. The iron grip in which, from the time of the Industrial Revolution, society has been held and moulded by the demands of science and technology needs to be seen in this light if there is to be liberation and social autonomy rather than passive subjection.

Even though technology may offer humanity apparently dazzling prospects,

such as freedom from work, these may lead to more severe problems if the philosophical models of technology are not properly understood.

Berting's survey takes a brief look at other models, such as the Marxist view of revolutionary change rather than gradualist development, Durkheim's view of the greater realization of individual development through increasing division of labour, the views of the historical school, who see all social institutions as the product of distinctive cultures, and Pareto's model of societal change as a cyclical process. The separation of secular and spiritual powers, as analysed by Weber, and the emergence of bureaucratic authority are among other matters discussed.

This philosophical overview provides an indispensable point of departure for our practical enquiries. In a sense it is the bridge between the two volumes in this series.

The first specific country study is Dr Lander's chapter on democracy, human rights, and the impact of scientific and technological development in Venezuela. Dr Lander looks at scientific and technological development in its role as an important political issue in the developing world. Lander identifies two factors responsible for this role: the perverse consequences of scientific and technological development and the ever-increasing demand for participation by citizens in these issues which have so much practical importance for them.

The chapter explains the basic constitutive pact of the Venezuelan democratic system, stemming from a consensus between the main political parties, and examines some of its economic and technological limitations. It has resulted in a highly interventionist state. Coupled with this, the oil economy, which resulted in the highest per capita income of Latin America, resulted also in expensive and large-scale solutions rather than modest proposals.

In the context of the third world, the problem assumes special relevance when technological choices absorb, for the sake of a few showpiece products, a disproportionate share of national resources. The author similarly shows how the stress on exports, aimed at developing the economy and servicing the foreign debt, leads to a decrease in the production of traditional foods and an increase in dependence on production technology. It is not difficult to see how deeply human rights issues become enmeshed in these problems. The political debates and social conflicts that have occurred in Latin America on these matters have given rise to perhaps the most copious body of literature on the subject. The reader will find Lander's researches a useful point of entry to this body of literature.

Lander's study shows how, despite official opposition to debates on nuclear policy, public opposition helped to bring about the cancellation of most of these programmes. It also draws attention to the arms industry and military expenditure and their multiple adverse effects upon human rights.

Environmental concerns also loom large in Latin America, with regard not only to the devastation of forests and contamination of air, water, and soil, but also to the immense development projects, such as those in the Brazilian Amazon Basin. All of these have become important political issues and highlight the

importance of the decision-making process. They also show the power of international environmental groups acting by themselves and in concert with domestic groups.

The author goes on to examine the "oil economy" of Venezuela and its impact upon lifestyle and politics. In spite of the "wealth" of the oil industry, the country still experiences conditions which in many areas do not differ widely from those of countries with more limited resources. The author describes how the Venezuelan experience can be taken as a case-study showing that inappropriate technological options can cause more problems than they solve.

The preference for the most advanced medical technology without adequate studies on its utility or efficiency is a major problem, shared by all contemporary societies. In the medical field in Venezuela, the paper observes that the privileged status of high-technology medicine leads to an incapacity to respond at other levels of the health system.

High-cost housing, not dependent on traditional technologies or local materials, is preferred on the basis of models in industrialized countries. Yet such housing is beyond the reach of the bulk of the population. Techniques of construction that have been abandoned could have much significance. The adverse impact on democracy of the requirements imposed on the country by the International Monetary Fund has serious implications, as pointed out by the author, according to whom the very notion of national sovereignty thereby becomes blurred. The gap between precept and practice in human rights regulation, especially in such fields as environmental legislation, is also the subject of critical comment.

The pattern of another developing economy provides the backdrop for the next study in the series: Professor Vitit Muntarbhorn's article on "Technology and Human Rights: Critical Implications for Thailand." A high incidence of poverty in the country, together with a high degree of urban industrialization, raises a whole array of socio-economic and cultural issues. We encounter phenomena often seen in developing countries, an increasing gap between the rich and the poor and an environmental decline as a result of commercialization and industrialization. The tendency to view economic growth as a concern of overriding importance can result in a view of human beings as instruments of production, in contradiction of the principle that all development must advance the welfare and culture of the population. Professor Muntarbhorn's paper gives us a glimpse of several arguments and concerns that have surfaced in the Thai context, where the needs of development and the demands of human rights find themselves at odds.

Professor Muntarbhorn traces the various steps taken by different arms of the Thai government to formulate national policy bearing on matters of science and technology. It is noteworthy that the Thai Constitution stipulates in section 61 that the state should promote the application of science and technology in the development of the country. Attention is drawn to the 32 indicators used to gauge the needs of villagers, which then lead to the mobilization of resources

and services to respond to those needs. It is interesting that these 32 indicators cover food, shelter, basic social services, security of life and property, family planing, participation in the development process and also, significantly, the development of the "spirit" of the people – that is, attitudes towards cooperation, drugs, tradition, and religion. The indicators are a useful summary for planners of the areas that need attention.

Other matters that claim attention are the problems raised by concepts of intellectual property, the eradication of rural poverty, the shortcomings of welfare services, and the adoption of technology without prior studies of its full impact upon the environment or the community. Examples of the latter are the "Otterboard Trawl," which refers to the transfer of advanced technology from Germany to improve efficiency in catching fish in the Gulf of Thailand, and the dependence on modern pesticides. The former has depleted fishery resources and the latter has increased pest resistance.

Professor Muntarbhorn's paper brings out, in a predominantly agricultural context, the importance of participation by the people in technology decisions that currently are made by an élite group. To step up the level of participation the educational system must be oriented towards technology and human rights education – a much-neglected field.

In Thailand, there has been a very active environmentalist movement, which has often been sufficiently assertive to prevent the construction of large-scale dams that would have adversely affected the environment. The conflict between the demands of industry and environmental concerns has been brought out quite strongly in Thailand, for example in the matter of logging.

Another interesting aspect highlighted by the author is that, whereas in the past human rights tended to be asserted mainly against the state and its agents, modern technology as currently used has brought to the surface the question of human rights protection not only from the state but also from the private sector.

The venue shifts to Eastern Europe in the next study, which highlights a different set of problems.

Dr Bozyk's sketch of changing attitudes towards human rights in Poland shows the pronounced shift that has occurred, from a concentration on collective rights to one on individual rights. This shift has produced a marked impact on the direction of scientific and technological development.

An interesting institutional device reflecting the altered emphasis on individual rights is the Polish Commissioner for Civil Rights Protection. This is in addition to the human rights work of such institutions as the Supreme Administrative Court (operative since 1980), the Tribunal of State (since 1982), and the Constitutional Tribunal (since 1985).

After sketching out these altered attitudes and the resulting institutional structures, Dr Bozyk goes on to analyse the interaction between human rights and technological development in Poland, both from the theoretical standpoint and through an examination of specific Polish projects. On a theoretical plane, he traces the interactions between an authoritative political system, an authoritarian

economic system, and human rights and technology. He shows the importance of guiding technological development, distinguishing between administrative guidance "from above" and guidance through incentives and market-oriented methods. The specific projects examined are the Nowa Huta steel factory and the textile industry in Łódz.

The current state of technological progress in Poland is examined in relation to the developed industrial economies of the West as well as the Eastern European countries. In basic sciences such as mathematics, physics, astronomy, and mechanics, Poland is a country to be reckoned with by any standards, whereas in applied sciences such as electronics, computer sciences, automation, and chemistry, it lags behind as a result of a lack of indispensable technical equipment. The causes of these inadequacies are explained in terms of government policy and human rights priorities.

In the 1980s a process of decentralization of authority in relation to technological expansion was initiated and, at the beginning of the 1990s, Polish manufacturing and scientific/technological enterprises gained full legal and financial independence. At the same time, consumer, conservationist, and other organizations gained the right to veto decisions on technological development. In all of these developments the impact of the new orientation on individual human rights is apparent.

The past interrelationship between the basic character of human rights and the development of traditional technologies is of great interest. Mechanization and automation influence human rights at many points. The impact of industrial technology on human rights is well illustrated through the case-studies of a Polish heavy industry – the steel factory Nowa Huta – and a light industry – the textile industry in Łódz. The immense Nowa Huta complex and the environmental problems resulting from it constitute a classical example of an industrial development being determined and located on the principles of an authoritarian system. Nowa Huta illustrates the inextricable manner in which decisions relating to the choice of technology for a particular region are linked to the enjoyment and deprivation of human rights. As the decision-making process loses its authoritarian character, there is a marked trend towards increasing recognition of individually oriented, rather than collectively oriented, human rights and a trend towards participatory decision-making, though this latter is heavily dependent upon the amount of knowledge – general, technical, organizational and economic – at the people's disposal.

The author also outlines the position in Poland in relation to the interaction between advanced technologies – electronic communications, computerization, and nuclear energy in particular – and human rights.

The essay is a careful demonstration of the interaction between science and technology and human rights in a social and political setting that may not be familiar to many Western readers. It illustrates the dynamic changes taking place in current patterns of technological decision-making and their resultant impact upon both the nature and the quality of human rights. Many countries confronted with a changing emphasis on human rights values and changing patterns

of technological decision-making could benefit from this intimate study of the Polish experience.

From an examination of these three very different sorts of economies of the developing world, the focus shifts to a historical survey of the damaging impact on a traditional society of the destructive firearms technology of the West. The Ethiopian study shows how, at every stage after contact with this technology, the rulers accorded prime importance to its acquisition, much to the detriment of both indigenous technology and the development of other lines of modern technology.

The study reveals the existence of an Ethiopian technology sufficient to produce guns and gunpowder, and also the adaptation of materials from native flora for the purpose of the manufacture of gunpowder. It reveals a high degree of creativity which could have blossomed into a variety of local technological skills, but which was all diverted into weapons, thereby stunting the development of Ethiopian technology.

This study, which goes into considerable historical detail to illustrate its main points, shows how firearms caused the crumbling of traditional Ethiopian society and whatever human rights protections it had devised. It also demonstrates the adverse impact of this technology upon management and the environment. Against the backdrop of Ethiopian history, we see how this technology has resulted in the reduction of Ethiopian society to a series of warring groups.

Another important area is the interrelationship between the social attitude towards artisans and the level of technology development. Where artisans thrive and are respected, technology thrives. Where the reverse is the case, technology is stifled. The Ethiopian fear of this class and the prejudice felt towards it had a crippling effect upon technology development.

The authors use the example of firearms to demonstrate that there has been a consistent lack, to this day, of a coherent science and technology policy, as a result of which the importation and adoption of modern technologies has been haphazard. Such factories and enterprises as exist date back to before the revolution of 1974. These were largely the work of individual entrepreneurs and bear little relationship to general technology needs, cottage industries, and natural resources. Research and development is in its infancy. Uncritical importation of technological hardware is killing cottage industry.

Another important area covered in this study is concerned with the traditional work of women and the technology and human rights aspects relating thereto. The study points out that the traditional injustice to women with regard to their share of the workload tends to be perpetuated under modern conditions, where, in several African countries, it is the men and not the women who are given the benefits of agricultural extension services. Moreover, because men are responsible for public activities and the women are bound to the family, the latter tend to be left out of the database for planning, education, and technological innovation. The deficiency of women's education is greatest in the technological field, in spite of women's importance in the labour force.

An interesting aspect deserving of attention by technology planners is that when a strictly feminine job is mechanized, as with the motorized grinding mill, the formerly feminine tasks are taken over by men, leaving the women with the more poorly paid jobs, such as cleaning the grain before it enters the grinding mill. Also men play the determining role in deciding what technologies should be adopted and are not primarily concerned with easing the workload of the women. The study concludes that the neglect of the technological problems of women, whether in the workplace or in the home, has to change if third-world countries are to develop at all. The impact of cash crops on traditional agriculture is also examined, as is the tendency of cash crops to attract such new technology as might be available.

The Ethiopian context, so remote to most readers, is brought alive by the Egziabher study. It provides essential background information for the planning of new technologies in a manner that will be least damaging to human rights and most conducive to the betterment of the life and working conditions of that half of the population whose position tends too often to be overlooked.

From these studies of the developing world we revert to the Western European milieu and the study of problems associated with sophisticated biomedical technology. Aart Hendriks and Manfred Nowak contribute a chapter, written with particular reference to the Netherlands, on the impact of advanced methods of medical treatment on human rights.

Biomedical advances are without a doubt one of the most far-reaching areas of modern technological achievement. Their potential to affect human society in all its aspects, from macro-social organization to the micro-facets of their impact upon the human body, exceeds the power wielded by many other branches of technology. Moreover, these advances, still in their infancy, open up large vistas hitherto contemplated only in the area of science fiction. These possibilities necessitate the timely consideration of the potential for good or ill of this branch of science.

Given that the European context is one in which these impacts will be felt ahead of most other sectors of the global society, it is appropriate that this case-study should focus on the problems which have already emerged, and which are seen as likely to emerge, in the context of the advanced scientific culture of Europe.

The authors focus on the major implications of advanced medical treatment methods on the rights and freedoms of the individual recipient of health care. They draw attention to the new contradictions in society that may emerge from the introduction of the new treatment methods. Some groups will benefit and others will be hindered in the enjoyment of their rights. The paper seeks to achieve a balance between these conflicting positions on the basis of current international human rights law. The authors strike a note of caution in relation to their conclusions, as the impact of rapid development in this field has still not been fully realized.

The paper deals, *inter alia*, with artificial methods of procreation, medical

genetics, and compulsory medical examinations. It also provides a useful background of basic information about relevant human rights and human rights structures that function in the European region.

Among the topics dealt with in the section on artificial methods of procreation are artificial insemination, egg donation, in vitro fertilization, and surrogacy. To what extent may states restrict reproductive technologies? Should access to artificial methods of procreation be restricted only to married couples? How can the exploitation of surrogacy measures be restrained? These are some of the fascinating questions addressed, which give us some idea of the kaleidoscope of issues opened up by the new genetic technology.

Medical genetics, which emerged as a new science in the 1960s, resulted from progress in biomedical and molecular genetics that made screening for hereditary and inborn traits possible. Recombinant DNA techniques bring within the range of possibility a type of genetic structuring that goes so far as to raise the question of the dangers of manipulation of the human body. The impact on human rights is, of course, profound.

The irreversible effects on future generations of even therapeutic engineering raise difficult conceptual issues. The authors make recommendations in relation to genetic experiments and research, and stress the need for international cooperation. Issues relating to privacy and the protection of personal data, and the right to the enjoyment of autonomy, are among the matters discussed.

On compulsory and mandatory medical examinations, the authors stress the importance of the "informed consent" principle. They discuss such issues as compulsory medical examinations by the state, by private individuals, and by companies, thus foreshadowing problems which must soon be faced before these technologies become the subject of general application.

The conclusions drawn in this chapter will serve as important guidelines to all who are engaged in actual research and in the administrative sectors of public life, and who will need to make policy decisions on the grave and far-reaching issues involved. Moreover, as these technologies, which are at present confined to advanced technological societies, become global in their scope, the guidelines emerging from studies such as these will have universal application.

These studies, representative of different geographical regions and of different types of technology, open up many fields for further inquiry. It is hoped they will prove both informative and stimulating.

NOTES

1. The Bellagio Declaration was adopted at a meeting of planners, practitioners, opinion leaders, and scientists meeting at the Rockefeller Foundation Study and Conference Centre in Bellagio, Italy, on 13–16 November 1989. For the text, see Development Dialogue, vol. 2 (1989): 177–84.
2. Development Forum, vol. 19, no. 2, (1991): 24.

1

Technological Impacts on Human Rights: Models of Development, Science and Technology, and Human Rights

JAN BERTING

INTRODUCTION

The coming of the industrial society, based on a new division of labour and on the systematic application of new technologies, was accompanied by the advent of a new image of man and society. This new image was expressed in such important documents as the Constitution of Virginia, Article 1 (1776), the Bill of Rights as part of the Constitution of the United States of America (1788) and the *Déclaration des droits de l'homme et du citoyen* (1789). Those documents brought to the fore the pivotal idea of human rights as universal rights, grounded on the recognition of the inherent dignity of all members of the human family.[1]

During the Second World War mankind experienced extreme cruelties on a large scale, both from policies based on ideologies which emphasized the supposed inequality of "races," and from the uses of new military technologies. After the turmoil of this war the Universal Declaration of Human Rights (1948) stressed that "All human beings are born free and equal in dignity and rights. They are endowed with reason and conscience and should act towards one another in a spirit of brotherhood" (Article 1). The universality of human rights is, again, emphasized in Article 2: "Everyone is entitled to all the rights and freedoms set forth in the Declaration, without distinction of any kind, such as race, colour, sex, language, religion, political or other opinion, national or social origin, property, birth, or other status."[2] Human beings, endowed with reason and conscience, are to be treated as ends in themselves, and not as passive victims of conditions and contingencies they cannot control.

Looking back on the advent of industrial society, it may come as a surprise when we see how little attention was paid, until recently, to a systematic analysis of the relationships between technological changes, on the one hand, and the development and actual implementation of human rights, on the other. We will return to this observation in the ensuing sections. In the meantime it is important to note that the question of the impact of new scientific and technological