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HUMAN RIGHTS AND SCIENTIFIC AND TECHNOLOGICAL DEVELOPMENTS

The impact of scientific and technological developments
on economic, social and cultural rights

Report of the Secretary-General

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INTRODUCTION ,

1. At its twenty-seventh session the Commission on Human Rights had before it the preliminary report of the Secretary-General on human rights and scientific and technological developments (E/CN.4/1028, Add.1-6, and Add.3/Corr.1), prepared in pursuance of General Assembly resolution 2450 (XXIII), paragraph 2, of 19 December 1968.

2. In paragraph 3 of its resolution 10 (XXVII) of 18 March 1971, the Commission recognized the need during the Second United Nations Development Decade to concentrate its attention on the most important and basic problems of protecting human rights and fundamental freedoms in the context of scientific and technological progress, and in particular on:

"(a) Protection of human rights in the economic, social and cultural fields in accordance with the structure and resources of States and the scientific and technological level they have reached, as well as protection of the right to work in conditions of the automation and mechanization of production;

(b) The use of scientific and technological developments to foster respect for human rights and the legitimate interests of other peoples and respect for generally recognized moral standards and standards of international law;

(c) Prevention of the use of scientific and technological achievements to restrict fundamental democratic rights and freedoms".

3. In paragraph 4 of the resolution, the Commission requested the Secretary-General to continue his study of the consequences, for the observance of human rights, of current developments in science and technology, taking into account "the possibility of using them to improve living conditions and the enjoyment of economic, social and cultural rights".

4. The present paper is submitted in pursuance of these requests. Like document E/CN.4/1028 and addenda, it is a preliminary report.

5. The present paper deals with the impact, both favourable and unfavourable, of recent scientific and technological developments on certain economic and social rights of the individual, namely, two aspects of the right to an adequate standard of living, specifically, food and clothing. The impact of recent scientific and technological developments on other economic, social and cultural rights will be examined in a subsequent paper or papers.

6. It is the purpose of the present report to examine the impact of scientific and technological developments in the light of the international standards adopted by the United Nations to promote respect for, and observance of, human rights and fundamental freedoms for all, particularly the Universal Declaration of Human Rights and the International Covenants on Human Rights.

7. The utilization of new developments in science and technology to "improve living conditions and the enjoyment of economic, social and cultural rights", referred to in paragraph 4 of Commission resolution 10 (XXVII), has been made a part of the international development strategy for the Second United Nations Development Decade adopted by the General Assembly at its twenty-fifth session. 1/ It may, similarly, be found as a policy statement contained in the Declaration on Social Progress and Development adopted by the General Assembly at its twenty-fourth session. 2/ It has formed an integral part, explicitly or implicitly, of the work of a number of the specialized agencies. While it is not the purpose of the present study to lay before the Commission a survey of the work done by the United Nations and its family of organizations to promote economic, social and cultural rights in the context of recent scientific and technological developments, the study does draw attention to relevant important work done by them.

8. In accordance with paragraph 6 of Commission resolution 10 (XXVII), between 13 May and 15 June 1971, letters were sent to the specialized agencies and the International Atomic Energy Agency, requesting them to submit to the Commission, through the Secretary-General, a report on the problems referred to in that resolution in relation to those rights falling within their competence. The Food and Agriculture Organization (12 July 1971), International Civil Aviation Organization (13 August 1971), International Monetary Fund (22 June 1971), World Meteorological Organization (19 July 1971) and Inter-Governmental Maritime Consultative Organization (26 July 1971) indicated that they had nothing of substance to contribute. On 10 February 1972, the FAO forwarded, however, the report of its Special Committee on Agrarian Reform, which was prepared in pursuance of resolution 5/69 of the Conference of FAO, adopted at the fifteenth session of the Conference. The replies forwarded by the International Bank for Reconstruction and Development (30 June 1971) and UNESCO (10 February 1972) and the interim replies forwarded by the International Atomic Energy Agency (24 June 1971) and International Labour Organisation (16 November 1971) may be found in the annex to document E/CN.4/1083. 2a/

1/ General Assembly resolution 2626 (XXV) of 24 October 1970; see, for example, section B of that resolution, on goals and objectives, and section C (7) and (8), on policy measures concerning, respectively, science and technology and human development.

2/ General Assembly resolution 2542 (XXIV) of 11 December 1969. Article 13 of that Declaration, for instance, indicates that the Declaration's objectives include (a) an equitable sharing of scientific and technological advances by developed and developing countries and a steady increase in "the use of science and technology for the benefit of the social development of society"; (b) in words recalling the objectives of the study requested by the Assembly in resolution 2450 (XXIII), para. 1 (d), the establishment of a "harmonious balance between scientific, technological and material progress and the intellectual, spiritual, cultural and moral advancement of humanity"; and (c) the protection and improvement of the human environment.

2a/ The Universal Postal Union forwarded a reply on 20 December 1971, relating to topics of the Secretary-General's study other than those discussed in the present paper.

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RIGHT TO A STANDARD OF LIVING ADEQUATE FOR HEALTH AND WELL-BEING

9. The Universal Declaration of Human Rights provides that everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing, medical care and necessary social services, and the right to security in the event of unemployment, sickness, disability, widowhood, old age or other lack of livelihood in circumstances beyond his control (article 25, paragraph 1).

10. In the International Covenant on Economic, Social and Cultural Rights, the States parties recognize the right of everyone to "an adequate standard of living for himself and his family, including adequate food, clothing and housing, and to the continuous improvement of living conditions". The Covenant provides that the parties will take "appropriate steps to ensure the realization of this right, recognizing to this effect the essential importance of international co-operation based on free consent". 3/

11. The contribution of recent scientific and technological developments to "the continuous improvement of living conditions" has been impressive, indeed. The material presented below, however, is of necessity not exhaustive; but attention is drawn to the report of the Advisory Committee on the Application of Science and Technology to Development, which contains a survey of the contributions which can be made by science and technology to economic and social development. 4/

A. Right to food

1. Existing international standards relating to the right to food

12. The Universal Declaration of Human Rights includes food as one of the factors which make up the right of the individual to a standard of living "adequate for the health and well-being of himself and of his family" (article 25, paragraph 1). The International Covenant on Economic, Social and Cultural Rights similarly includes "adequate food" as part of "the right of everyone to an adequate standard of living" (article 11, paragraph 1). The Covenant, moreover, elaborates this concept further by specifying, in article 11, paragraph 2:

"The States Parties to the present Covenant, recognizing the fundamental right of everyone to be free from hunger, shall take, individually and through international co-operation, the measures, including specific programmes, which are needed:

3/ Article 11 (1). In the Covenant the questions of health and social security are dealt with separately in articles 12 and 9, respectively.

4/ World Plan of Action for the Application of Science and Technology to Development (United Nations publications, Sales No. 71.II.A.18).

"(a) To improve methods of production, conservation and distribution of food by making full use of technical and scientific knowledge, by disseminating knowledge of the principles of nutrition and by developing or reforming agrarian systems in such a way as to achieve the most efficient development and utilization of natural resources;

"(b) Taking into account the problems of both food-importing and food-exporting countries, to ensure an equitable distribution of world food supplies in relation to need."

2. Favourable impact of recent scientific and technological developments on the availability and quality of food

13. The annual publication of the Food and Agriculture Organization of the United Nations, The State of Food and Agriculture, devotes a chapter of its 1970 issue to technological progress in food production. It contains the following statement:

"Rapid technological progress has been one of the most striking features of the postwar period. Many of the developments have been highly spectacular, especially in atomic science, space technology and computer technology, and in genetics and the understanding of the basic processes of life. Each of these more spectacular fields has brought important advances in food and agricultural technology, although many of them have so far contributed much more to potential than to actual achievement." 5/

14. The successes in the development of high-yielding wheat, rice and maize varieties have been so great as to warrant the hope that these advances, which have resulted in what is referred to as the "green revolution", may provide sufficient food for the hungry of the world. 6/ The progress made in breeding plants for enhanced resistance to drought, wind and diseases and for increased yield has come about primarily through a better understanding of plant genetics and induced mutations. 7/ Radiation and chemical mutagens have recently been used to accelerate natural processes of biological change. 8/

5/ The State of Food and Agriculture (Rome, FAO, 1970), p. 139. Attention may also be drawn to a report of 1961, entitled Current trends in scientific research - survey of the main trends of inquiry in the field of the natural sciences, the dissemination of scientific knowledge and the application of such knowledge for peaceful ends, prepared by Professor Pierre Auger (E/3362/Rev.1), part I, chapter IV, of which deals with the food and agricultural sciences. The report was prepared in pursuance of General Assembly resolution 1260 (XIII) of 14 November 1958.

6/ W.H. Pawley, Possibilities of Increasing World Food Production, Freedom from Hunger Campaign Basic Studies, No. 10 (Rome, FAO, 1967). For a summary of relevant FAO activities see also E/CN.4/1023/Add.2, annex B.

7/ "Genetic technology and agricultural development", Science (USA), 9 July 1971, p. 119. R.A. Silow, ed., The Use of Induced Mutations in Plant Breeding (New York, Pergamon Press, 1965). Manual on Mutation Breeding, Technical Report Series, No. 119 (Vienna, International Atomic Energy Agency (IAEA), 1970).

8/ Nuclear Techniques and the Green Revolution, Joint Programme of the FAO and the IAEA on Nuclear Techniques in Food and Agriculture (Vienna, IAEA, June 1971), INFCIRC/146/Add.1. See also Nuclear Techniques for Increased Food Production, Freedom From Hunger Campaign Basic Studies, No. 22 (Rome, FAO and IAEA, 1969). /...

15. Two other pillars upon which the green revolution rests are synthetic pesticides and fertilizers. The introduction of the new high-yielding food crops in developing countries has caused a new demand by farmers for fertilizers, which have, moreover, become more effective and less costly. At the same time, powerful pesticides and fungicides are widely used to protect crops against diseases and insect and rodent infestations.
16. The science of water and soil management has progressed greatly, enabling it to meet the challenge of the green revolution. Considerable attention has been paid to the possibilities presented by desalinating sea water and thus making it usable for irrigation purposes. Within the United Nations system, the Economic and Social Council has dealt with this question. In 1967, the Council requested the Secretary-General, in co-operation with the specialized agencies and the International Atomic Energy Agency, to intensify the work of the United Nations on water desalination, with special regard to the problems facing the developing countries in the application of water desalination techniques. It also invited Member States possessing the necessary technology for water desalination to make all practicable use of the machinery of the United Nations in channelling their assistance to developing countries. ^{9/} Development work continues in order to produce low-cost desalinated water. At present the cost is still too high for general agricultural use, though desalinated water is occasionally being utilized for raising intensive-cultivation high-value crops. Moreover, the use of desalinated water for industrial and domestic consumption may in some situations help to preserve supplies of fresh water for agriculture.
17. Work is also being done in the artificial inducement of rainfall, the control of evaporation from reservoirs, and the reclamation of saline and water-logged land. Research in the efficient use and re-use of water has been advanced by sophisticated scientific soil and water surveys using isotopes and aerial photography.
18. High-altitude craft and orbiting satellites can be employed to estimate crop yields, study cropping patterns, detect symptoms of insect and disease infestations of crops, map and classify soils, measure soil moisture, and survey forest, fishery, and water resources. The projected use of observation satellites for remote surveying of earth resources has been referred to in the Secretary-General's preliminary report, in the chapter on "Respect for the integrity and sovereignty of nations in the light of advances in recording and other techniques" (E/CN.4/1028/Add.5, paragraphs 58-61). ^{10/}

^{9/} Resolution 1204 (XLII) of 26 May 1967. Mention may also be made of the Secretary-General's report on water desalination, with special reference to major developments in 1966 (E/4307) and the First United Nations Desalination Plant Operation Survey (United Nations publication, Sales No. 69.II.B.17), and Water Desalination in Developing Countries (United Nations publication, Sales No. 64.II.B.5).

^{10/} A Working Group on Remote Sensing of the Earth by Satellites has since been established by the Scientific and Technological Sub-Commission of the Committee on the Peaceful Uses of Outer Space (See Official Records of the General Assembly, Twenty-Sixth Session, Supplement No. 20 (A/8420), paras. 10-12).

19. A report on the implications of the green revolution (E/5012, part II) was prepared under the auspices of, and approved by, the Administrative Committee on Co-ordination (ACC) with the object of evolving a framework for harmonizing and concentrating interagency efforts in this area so as to enhance their impact. The study surveys the principal elements involved in the green revolution, including certain economic and social implications, and indicates current programmes and activities undertaken by the organizations within the United Nations system. 11/ The report of FAO's Special Committee on Agrarian Reform discusses the "green revolution" in the context of agrarian reform. 11a/
20. The application of science to animal husbandry has made possible the artificial stimulation of growth in animals and provided sturdier livestock. The above-mentioned 1970 issue of The State of Food and Agriculture reports that "animal breeding has relied increasingly on artificial insemination, combined with improved techniques for the long-term preservation of semen. Much progress has been made in the production of balanced livestock feeds, including the use of protein supplements such as urea and synthetic amino acids". 12/ Veterinary science has developed to such a stage that it is now technically possible to control most of the more important animal diseases through preventive techniques and the use of the new combined or polyvalent vaccines. At the same time the use of tissue and culture mediums has made possible the rapid bulk production of better and cheaper vaccines; rapid communication and transportation techniques permit their quick distribution.
21. Industrial-type techniques have been developed for many areas of agricultural production. Large-scale broiler poultry and egg production may now be carried out on a "conveyor-belt" basis. The almost complete mechanization of the feeding and care of many animals has cut the costs of many farm products in certain parts of the world. Moreover, farm machinery has become so sophisticated, as exemplified by advances in horticultural and fruit-harvesting equipment, that one man can now do the work of several. 13/
22. Sophisticated sonic and electrical equipment is now used to detect, attract and catch whole schools of fish. Large trawlers are equipped as factories which can freeze and process great quantities of fish before coming into port again. 14/ Also, a great deal more has become known about the habits of fish and about increasing fish reproduction. 15/

11/ E/5012, part II.

11a/ Forwarded by FAO on 10 February 1972.

12/ Op. cit., p. 140.

13/ Agriculture and Industrialization, Freedom from Hunger Campaign Basic Studies, No. 17 (Rome, FAO, 1967).

14/ P.F. Meyer-Warden, Electrical Fishing, FAO Fisheries Studies, No. 7 (Rome, FAO, 1965); Modern Fishing Gear of the World, arranged from the papers and discussions of the second FAO World Fishing Gear Congress, London, 1963 (London, Fishing News Books, Ltd., 1964).

15/ E.D. Le Cren, The Application of Science to Inland Fisheries, FAO Fisheries Studies, No. 8 (Rome, 1958).

23. Computers and modern business machines are being used to great advantage in the production, distribution and retailing of food and in the exchange of agricultural information. 16/ Computers have also been found to have a great potential for storing and processing data on the price and quantity of food-stuffs throughout the world and thus to assist in carrying out the requirement of article 11, paragraph 2 (b), of the Covenant, referred to in paragraph 12, above.

24. Advances in nutritional science make it possible to estimate more accurately human dietary requirements, identify the most efficient food sources and determine alternative sources. 17/ In its report, the Panel of Experts on the Protein Problem Confronting Developing Countries which met at United Nations Headquarters in May 1971 has pointed out that in the long run, new and unconventional sources of protein will be needed to supplement conventional agricultural resources in meeting the needs of a growing world population. "Production of various forms of single cell protein for animal or human consumption is possible without the use of agricultural land", the report stated, "when the energy source is from petroleum hydrocarbons or when photosynthetic algae are employed. Moreover, vegetable wastes and even sewage can be converted microbiologically into useful protein sources." 18/ Natural products of low nutritional value or prepared foods which

16/ I. de Sola Pool, Philip J. Stone and Alexander Szalai, Communications, Computers and Automation for Development, UNITAR Research Reports, No. 6 (New York, UNITAR, 1971), pp. 43-45.

17/ See, e.g., Helen Charley, Food Science (New York, Ronald Press, 1971).

18/ Strategy Statement on Action to Avert the Protein Crisis in the Developing Countries: Report of the Secretary-General (United Nations publication, Sales No. 71.II.A.17), p. 23. The Panel was convened by the Secretary-General under General Assembly resolution 2684 (XXV) of 11 December 1970.

The General Assembly, on 20 December 1971, adopted resolution 2428 (XXVI) on protein resources, which recommended modification of the terms of reference of the FAO/UNICEF/WHO Protein Advisory Group so as to enable it to broaden its activities, including identification, evaluation and advice on "problems of protein resource development and protein-calorie malnutrition requiring scientific and technological research". It also urged Governments to implement as appropriate the essential elements of the Strategy Statement on Action to Avert the Protein Crisis in the Developing Countries, annexed to the resolution, which include such points as encouragement of research design to improve the nutritive value of cereal proteins through genetic engineering; encouragement of increased production of animal proteins, particularly through research on increasing forage yields and production; and facilitating the application of science and technology to the development of new protein sources in order to supplement conventional food resources. The above-mentioned Protein Advisory Group was originally established by WHO in 1955 and reorganized in 1960 as a tripartite FAO/UNICEF/WHO body (see E.4592/Add.3, annex I, para. 1). In 1971, in accordance with a recommendation contained in Economic and Social Council resolution 1640 (LI), para. 5, and a decision taken by the Administrative Committee on Co-ordination (ACC), this body became the Protein Advisory Group of the United Nations.

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have lost vitamins during cooking and storage can be fortified by enriching them with complementary ingredients. 19/ New techniques of food preservation, especially drying and freezing and, more recently, irradiation, together with the use of synthetic additives, have permitted the wider distribution of previously perishable food-stuffs with a minimal loss of nutritional value.

3. Problems affecting human rights

25. The great potential of science and technology for increasing the world's food supply and thus for contributing to the implementation of the right to an adequate standard of living has been amply manifested. The new technologies, however, require knowledge, skill and vigilance in their application, so as to prevent harmful effects that may arise from their indiscriminate use and seriously depress the very standard of living adequate for health and well-being that they were intended to promote. Moreover, threats to the food supply may arise as a consequence of the application of science and technology in fields not related to food production. Reference has already been made in the preliminary report of the Secretary-General, under the subheading "Deterioration of the human environment", to the discussions at the twenty-third session of the General Assembly, where attention was drawn to various threats to the world food supply resulting from such indiscriminate use. 20/ These threats include such factors as erosion and other forms of soil deterioration resulting from over-exploitation of the soil due to faulty use of machinery or fertilizers; water pollution, not only by domestic sewage, but by industrial wastes, drained-off chemical fertilizers and pesticides and thermal pollution; other harmful secondary effects of pesticides and other biocides, chemical fertilizers and synthetic detergents; and oil pollution of the sea as a consequence of off-shore drilling and the use of larger oil tankers which can do great damage in case of accident. 21/

26. Considerable attention is being paid to these and similar problems by the competent organizations within the United Nations system. The Preparatory Committee for the United Nations Conference on the Human Environment is also concerned with these issues.

19/ A.A. Pokrovsky, "Qualitative and quantitative aspects of nutrition", Impact of Science on Society, (Paris, UNESCO), vol. XX, No. 3 (July-September 1970), pp. 226-227.

20/ Cf. E/CN.4/1028/Add.3, para. 330, and A/PV.1732-1733. The discussion in the General Assembly, under the agenda item "The problems of human environment", led to the adoption of resolution 2398 (XXIII) of 3 December 1968, by which the Assembly decided to convene in 1972 a United Nations Conference on the Human Environment.

21/ See, e.g., O. Schachter and D. Serwer, Report on Marine Pollution Problems and Remedies (United Nations publication OPI/444-06208).

27. The Provisional Indicative World Plan for Agricultural Development of the Food and Agriculture Organization points out the following:

"Several developed countries with a long history of use of organo-chlorines (DDT, Aldrin, etc.) have recently instituted a ban on their use because, although not acutely toxic to human beings, they are lethal to fish (for example the recent mass poisoning of fish in the Rhine by one such compound through an industrial accident) and have been shown to have cumulative effects to birds and mammals, particularly where a 'food-chain' is involved. They also break down relatively slowly in the soil. Some alternative compounds, whilst being rendered innocuous fairly quickly after application, are acutely toxic to human beings where adequate precautions are not taken during application, and there have been a number of cases of accidental poisoning (e.g., parathion)." 22/

The Food and Agriculture Organization has established a Committee on Pesticides in Agriculture, which has collaborated with the World Health Organization's Expert Committee on Pesticide Residues in issuing several reports on the dangers of pesticides. 23/

28. The previously mentioned special report prepared by the Administrative Committee on Co-ordination on the implications of the green revolution states:

"Run-off from areas treated with massive doses of fertilizer or insecticide may pollute surface and groundwater and affect terrestrial environments and aquatic life in streams, rivers, ponds and lakes through poisoning and eutrophication. A case in point is the Lower Ganges Basin where in certain areas 'local' concentration of minerals and pesticides in the run-off could become quite serious in the immediate future." 24/

29. On the other hand, the same report also expresses the view that the hazards of pollution from fertilizers and pesticides may be regarded as long-term ones and "should not give rise to panicky short-term palliatives, such as outright banning of DDT, which can only set back developmental efforts without touching the real core of the over-all pollution problem". 25/

30. In this connexion it may be recalled that in 1969, the World Health Assembly recognized that the "prolonged and large-scale use of persistent pesticides", in

22/ Vol. I (Rome, FAO, 1970), para. 145.

23/ Cf. Evaluation of the Toxicity of Pesticide Residues in Food, report of the joint meeting of the FAO Committee on Pesticides in Agriculture and the WHO Expert Committee on Pesticide Residues, 1961; also Pesticide Residues in Food, report of the joint FAO/WHO meeting, 1968 (Geneva, WHO, 1969).

24/ E/5012, part II, para. 75.

25/ Ibid., para. 74.

particular those of the chlorinated hydrocarbon type, in agriculture and public health may lead to an accumulation of certain of those substances in the environment, as well as in human and animal tissues, and to the development of resistance in vectors; it noted that currently there was no alternative method of vector control that could replace the use of persistent pesticides for the control of vector-borne diseases. The Assembly recommended that WHO stimulate and intensify research on the development of alternative methods of vector control. 26/ In 1970, the Director-General of WHO accordingly submitted to the twenty-third World Health Assembly a report on alternative methods of vector control, in which further research on biological, genetic and certain other methods of control were discussed and proposed as alternatives to control of insect vectors by chemical means. 27/ The World Health Assembly authorized such research. 27/

31. Warnings have been heard that the vast over-use of artificial nitrogen fertilizers may lead to serious health dangers, particularly for infants, who are highly sensitive to poisoning by nitrogen by-products. Some scientists also consider that there may be a causal relationship between the use of nitrate fertilizers which are building up large residues in green vegetables (especially spinach, celery and lettuce) and cancer in animals and man. 28/

32. Another problem requiring vigilance is the possibility of radioactive contamination of food. The Food and Agriculture Organization, the World Health Organization and the International Atomic Energy Agency have been concerned with this matter. A seminar on agricultural and public health aspects of radioactive contamination in normal and emergency situations was held in 1961, in Scheveningen, the Netherlands, at which one of its panels discussed the problems of establishing permissible levels of radioactivity in food in the light of steadily increasing radiation levels in the world and of the fears concerning their long-range effects. 29/ The intentional irradiation of foods for preservation purposes also

26/ Official Records of the World Health Organization, No. 176, Twenty-second World Health Assembly, part I, resolution WHA 22.40.

27/ Ibid., No. 184, Twenty-third World Health Assembly, part I, annex 9 and resolution WHA 23.33.

28/ See, e.g., the statement by Dr. Barry Commoner, cited in The Washington Post, 27 December 1968; William Lijinsky and Samuel Epstein, "Nitrosamines as Environmental Carcinogens", Nature (London), vol. 225, 3 January 1970, p. 21; André Vorson, Sol, herbe, cancer; la santé de l'animal et de l'homme dépendent de l'équilibre du sol (Paris, Maison rustique, 1959).

29/ Agricultural and Public Health Aspects of Radioactive Contamination in Normal and Emergency Situations, papers presented at the FAO/WHO/IAEA seminar, Scheveningen, the Netherlands, 11-15 December 1961, FAO Atomic Energy Series, No. 5 (Rome, FAO, 1964), pp. 160-188; see also Agricultural and Public Health Aspects of Environmental Contamination by Radioactive Materials, Proceedings of the FAO/WHO/IAEA seminar, Vienna, 24-28 March 1969 (Vienna, IAEA, 1969 (STI/PUB/226)).

presents inherent dangers and must be carefully monitored, since, for instance, overdoses of radiation could produce stable substances possessing mutagenic effects. 30/ The problem of radioactive contamination was touched upon in the Secretary-General's preliminary report, under the subheading "Hazards arising from atomic radiation" (see E/CN.4/1028/Add.3/Corr.1, paragraph 338).

33. Artificial growth stimulants used on livestock and crops may have harmful consequences for human beings who eat such food if these chemicals manifest stability after intake. 31/ The addition of hormones to animal feeds has, in fact, been prohibited in a number of countries. 32/ The employment of strong antibiotics in animal feeds to protect the animal from various diseases has also come under considerable criticism. The danger lies in the development of resistant bacteria after extended application of these antibiotics. 33/ As stated by the United States Commissioner of Food and Drugs, Charles C. Edwards, "in most cases this resistance is transferable and presents a potential health hazard to humans" in that it establishes a bacterial population not amenable to normal therapeutics. 34/ The United States Food and Drug Administration has assigned a task force to review the use of antibiotics in animal feeds. 35/ The New York Academy of Sciences has also decided to study the dangers of drug-resistant bacteria being passed to humans by animals. 36/

30/ The Technical Basis for Legislation on Irradiated Food, report of a Joint FAO/WHO/IAEA Expert Committee, Rome 21-28 April 1964, FAO Atomic Energy Series, No. 6/WHO Technical Report Series, No. 316 (Rome, FAO, 1965); Microbiological Problems in Food Preservation by Irradiation, proceedings of a Panel Discussion, Vienna, 1966 (Vienna, IAEA, 1967 (STI/PUB/168)); Food Irradiation, Proceedings of the FAO/IAEA symposium, Karlsruhe, Federal Republic of Germany, (Vienna, IAEA, 1966 (STI/PUB/127)); Wholesomeness of Irradiated Food with Special Reference to Wheat, Potatoes and Onions, WHO Technical Reports Series, No. 451 (Paris, WHO, 1970).

31/ Pokrovsky, op. cit., pp. 232-233.

32/ Cf. Animal Feedstuffs: Regulations Governing their Manufacture and Sale in European Countries (Rome, FAO, 1963).

33/ "Concern at use of anti-biotic drugs for livestock", New York Times, 26 February 1971; "Resistant Bacteria Pose a New Danger", ibid., 19 October 1970, sect. IV.

34/ Speech at annual meeting of Animal Health Institute in Boca Raton, Florida, April 1970, reported in Chemical and Engineering News (Washington, D.C.), 4 May 1970, p. 13.

35/ United States Department of Health, Education and Welfare, H.E.W. News, 70-19, 25 May 1970.

36/ New York Times, 15 October 1970.

34. The potential hazards of food additives have often been noted. ^{37/} An example of the prolonged use of a chemical substitute, subsequently considered to be harmful and removed from the market, is the case of an artificial sweetener, cyclamate, which was later reported to be capable of causing harmful consequences, e.g., disrupting the effects of anti-coagulants in humans, changing the way the body absorbs certain drugs, affecting the reproductive system and causing cancer. ^{38/} Chemical preservatives, such as boric acid and urotropine, and certain colouring additives have also been restricted in their commercial use because of their toxic effects and the cancer danger they represented. ^{39/} Some of the problems posed by the addition of chemicals to foods have been referred to in the Secretary-General's preliminary report within the context of "Experiments on human subjects" (See E/CN.4/1028/Add.2, paragraph 262). The laws of many States do not require the constituent ingredients to be indicated on food packages. Even where labelling is required, the names of chemicals may be meaningless to the average consumer. The problem is further aggravated by the inherent difficulty of following and analyzing the possible long-term effects on different individuals of constantly appearing new chemical ingredients.

35. A related problem arises from certain industrial techniques used in food processing that may result in the formation of toxic, even carcinogenic, by-products, for instance where the product is subjected to prolonged or repeated heating. ^{39/}

36. Modern chemical processes make it possible, moreover, to disguise effectively substances of inferior nutritional value by colouring additives, preservatives, seasonings, tenderizers and other technological aids.

37. Warnings have also been heard that food-borne diseases may be increasing in the more technically developed societies and that such diseases may spread more widely than previously. ^{40/} The populations of the world are gradually moving away from

^{37/} "The Hazards of Food Additives", W.H.O. Chronicle, vol. 15, No. 7 (1961, pp. 245-248, A joint FAO/WHO conference on food additives, exploratory in nature, was held in 1955. Upon the recommendation of this conference, a Joint Expert Committee on Food Additives considered the technical and administrative aspects of the problems involved and submitted a report, General Principles Governing the Use of Food Additives, FAO Nutrition Meeting Report Series, No. 15. Other reports of the Expert Committee in the same series include Procedures for the Testing of Intentional Food Additives to Establish Their Safety for Use (No. 17); Evaluation of the Toxicity of a Number of Antimicrobials and Antioxidants (No. 31); Evaluation of the Carcinogenic Hazards of Food Additives (No. 29); Specifications for the Identity and Purity of Food Additives and Their Toxicological Evaluation: Emulsifiers, Stabilizers, Bleaching and Maturing Agents (No. 35).

^{38/} James Turner, The Chemical Feast (New York, Grossman, 1970), pp. 14-16, 18.

^{39/} Pokrovsky, op. cit., p. 233.

^{40/} European Technical Conference on Food-borne Infections and Intoxications, Geneva, 16-21 February 1959, WHO Technical Report Series, No. 184 (Geneva, WHO, 1959); see also, Dr. H.P.R. Seeliger, "Food-borne infections and intoxications in Europe", Bulletin of the World Health Organization, vol. 22, No. 5 (1960), pp. 469-484

farms and are therefore becoming dependent on a longer chain of processors, packers, transporters, distributors and retailers, which may mean increased opportunity for contamination and deterioration of food, including such accidents as undetected bacterial contamination through breakdowns in refrigeration or canning processes. Mr. Kenneth Hennington has referred to a number of specific instances of food poisoning as follows:

"Our mode of living and technology probably renders us more susceptible to food-borne infections today. The convenience foods, ready-to-eat items, and frozen prepared dinners requiring only minimum heating prior to serving open avenues for mass infection. Our production and distribution system is such that today the output of a plant may be distributed nationwide, or even worldwide. This means that an infected employee or a breakdown or deterioration of some phase of plant sanitation can infect thousands of consumers instead of a limited surrounding community. Our population concentration, human and food animal, with the resultant waste disposal and pollution problems, is likewise conducive to spread of infection.... Effective control of the food-borne infections, whether they be bacterial or viral in nature, entails a much higher and more rigid level of sanitation than generally has been practiced, or required, by industry, or by health and regulatory officials." 41/

38. Technological and other developments have led to a trend toward large-scale farms which specialize in single products. This has resulted in many cases in over-use of the land and in greater susceptibility of crops to blight or other sudden adverse conditions and, therefore, to increased reliance on fertilizers and pesticides. This, in turn, may ultimately affect the ecological balance and thus the food supply for future generations. Also, the indiscriminate use of modern fishing gear and techniques referred to in paragraph 22 above, may outstrip the capacity of fish to reproduce. 42/

39. The Secretary-General of the League of Arab States, Mr. Abdel Khalek Hassouna, has written:

"With the progress of biology and chemistry man was able to destroy some of the harmful plants using chemical compounds. He was also able to eliminate agricultural pests and insects. Such progress, however, may be misused thus leading to the destruction of food sources and useful cultivations on which man lives. There is no clear provision against such

41/ Speech before the 54th annual meeting of the International Association of Milk, Food and Environmental Sanitarians, Miami Beach, Florida, United States of America, 15 August 1967.

42/ The Effect of Fishing on Resources and the Selectivity of Fishing Gear, proceedings of the joint scientific meeting of ICNAF, ICES and FAO on fishing effort Lisbon, 1957, vol. 1; R. van Cleve, "The economic and scientific basis of the principle of abstention" (A/CONF.13/3).

an eventuality in the Universal Declaration or the International Covenants on Human Rights. Some of the materials used may sterilize the earth or threaten man's life if he eats some of the plants treated with these materials. They may also cause deformation. The subject is, therefore, related to man's right to life and food, hence the need to prohibit the misuse of such chemicals and to take the necessary precautions when using them to ensure that man will not be harmed in any way.

" ...

"The progress in biology and chemistry may also be used in eradicating animal and aquatic wealth thus endangering man's life when he eats such meat or fish. Man may also suffer a deficiency in his food as a result of the destruction of such wealth. It is, therefore, proposed that the Universal Declaration or the International Covenants on Human Rights should include a provision in this respect." 43/

40. As mentioned in paragraph 21 above, food production in many countries is now being carried on by industrial techniques. 44/ The very processes of mechanization that have led to more efficient production and to greatly increased food supplies have, however, caused labour problems and social problems 45/ which, in turn, may act as a brake on efforts to increase the food supply by the application of modern technology. References to these problems may be found in the above-mentioned ACC report, which also lists studies concerning these problems under way in a number of States, 46/ points out the following:

"The 'green revolution' has also sharply highlighted the fact that technical research alone is not enough: success depends greatly on the human factor and there is need for a parallel effort in economic and social studies, and for a close dialogue between technical and socio-economic research. It will be apparent from later sections of this paper that some of the 'second generation' problems might have been avoided and technical progress speeded up if such research had been adequately undertaken." 47/

43/ Communication dated 11 April 1970.

44/ "Food-Processing Industry", Industrialization of Developing Countries: Problems and Prospects, UNIDO Monographs on Industrial Development, No. 9 (ID/40/9); J. Volner, The Soviet Food Industry (Moscow, Foreign Language Publishers, 1958).

45/ Social consequences of technological developments in principal branches of the food products and drink industries, ILO tripartite technical meeting for the food products and drink industries, 1963, report II.

46/ See document E/5012, Part II, especially paras. 53-73. The Government of the Byelorussian Soviet Socialist Republic has reported that research was being carried out in that Republic on the social consequences of scientific and technological development in agriculture (Communication dated 26 March 1970).

47/ See E/5012, Part II, para. 22.

/...

41. The Economic and Social Council at its fifty-first session, taking note with appreciation of the ACC report, recommended that close attention be given to the impact of the new technology on "socio-economic development, including environmental aspects, taking into account the findings of the study of the social implications of the new agricultural technology being made by the United Nations Research Institute for Social Development. ^{48/} The Council decided that a review and appraisal of progress in the application of the new technology would be made at the mid-term of the Second United Nations Development Decade. ^{49/}

42. A serious problem affecting the provision of adequate food for the world has been the tremendous increase in population, itself caused in large part by progress in the health field. This question was referred to briefly in the preliminary report of the Secretary-General on human rights and scientific and technological developments, under the heading "Population explosion" (See E/CN.4/1028/Add.3, paragraph 333). The FAO provisional world plan states that "the population factor alone would ... require an increase of two thirds in food supplies over twenty years ... merely to maintain existing nutrition levels and patterns of consumption", ^{50/} which are generally considered inadequate. Moreover, the FAO study indicates that a 140 per cent increase in total food supply will be required by 1985 because of "urbanization and the growth of domestic market demand", itself a result of economic expansion stimulated by technological developments. The World Plan of Action for the Application of Science and Technology to Development indicates that food production for developing countries is presently increasing at a rate of only 2.7 per cent per year, a trend which, if continued, would "result in an overwhelming gap between supply and demand by 1985", and that any shortfall in supply "will pose incalculable long-term threats to the physical as well as the mental capability of future generations". ^{51/}

43. To identify and counter problems like those discussed above, affecting the right to food, it is necessary, among other things, to make provision for observing and testing the effects of new substances: for regulating or banning, where necessary, their production, sale and use; and for educating, where appropriate, potential users in their proper utilization. In making such arrangements, decisions have to be made concerning the nature and composition of the body or bodies that are to do the testing; the nature and composition of the body charged with making the decision; whether and, if so, how such decisions may be appealed; whether it is up to the producers to prove that the substance in question is harmless or up to the regulatory body to prove that it is harmful; whether and, if so, to what extent new protective standards need to be enacted, beyond the customary general standards concerning food purity, poisonous substances

^{48/} Cf. Economic and Social Council resolution 1495 (XLVIII) of 26 May 1970 on land reform. See also document E/5012, Part II, para. 70.

^{49/} Economic and Social Council resolution 1645 (LI) of 30 July 1971, on the green revolution.

^{50/} Provisional Indicative World Plan for Agricultural Development, vol. I (Rome, 1970), chap. 1, paras. 14 and 21.

^{51/} See United Nations publication, Sales No. 71.II.A18, p. 137.

etc. in force prior to development of the new synthetic substances: whether compensation should be paid for harmful effects of new substance and, if so, to whom and under what circumstances; and whether violations of such protective provisions should be subject to civil or to criminal penalties.

4. Legislation and other standards and guidelines

44. The information received from Governments under Commission resolution 10 (XXVII) does not contain specific data concerning legislation and other regulatory actions or court rulings on the matters discussed in this section. Some information on regulatory approaches to various problems, however, is contained in publications of the FAO and the WHO, including FAO's periodical publications Food and Agricultural Legislation and Current Food Additives Legislation (the latter issued under the joint FAO/WHO programme on food additives and pesticides). ^{52/} FAO also produces a Food Additives Control Series, examining food additives controls in individual countries, ^{53/} and has included in its Legislative Series two issues examining regulations governing the manufacture and sale of animal foodstuffs in European countries. ^{54/}

45. Summarized below are a few recent examples of institutional and substantive approaches adopted to cope with problems affecting the right to food such as those discussed in paragraphs 25-43 above, particularly, legislative and other arrangements concerning the control of pesticides, of certain chemical additives to animal feeds, and of irradiated and pre-packaged foods.

46. Finland's 1969 law on pesticides ^{55/} covers control of efficacy, utilization, manufacture, storage and transport of, and trade in, pesticides, as well as "the measures taken to prevent harmful effects of these substances on the health of man or useful animals, cultivated plants and cultivated land, and nature". Under the terms of this law, the control of pesticides to determine their biological effect and their effectiveness is undertaken by an Institute of Plant Protection, working in collaboration with the Finnish Agricultural Research Centre, the physical and chemical control of these substances being within the jurisdiction

^{52/} References to enactments and regulations relevant to the present section are also listed in FAO's Legislative Report Series.

^{53/} Relating to Canada (No. 1), the United Kingdom (No. 2), the Netherlands (No. 3), Australia (No. 4), Denmark (No. 5), France (No. 6), the Federal Republic of Germany (No. 7), and the USSR (No. 8).

^{54/} R. Ricard and T. Threlkeld, Animal Feedstuffs: Regulations Governing Their Manufacture and Sale in European Countries, FAO Legislative Series, No. 1 (Rome, FAO, 1957), and R. Ricard and M.H. French, Animal Feedstuffs: Regulations Governing Their Manufacture and Sale in European Countries, FAO Legislative Series, No. 4 (Rome, FAO, 1963).

^{55/} Law No. 327 of 23 May 1969 (text in FAO, Food and Agricultural Legislation, vol. XX, No. 1 (June 1971), part III/5), repealing Law No. 261/51 of 27 April 1951 on the Plant Protection Office.

/...

of the State Institute of Agricultural Chemistry. The sale (or other supply for use) of preparations intended as pesticides is subject to license, issued by the Institute of Plant Protection, whose decisions may be appealed to the Ministry of Agriculture. ^{56/} The Ministry, after having heard the Institute, has the power to prohibit the sale and use of pesticides found to be harmful to plants or animals or unsuitable or ineffective for the intended purpose. The Institute of Plant Protection is entitled to carry out inspections and investigations in premises where pesticides are manufactured, stored or sold. The Finnish Council of State appoints - on the nomination of the Ministry of Agriculture - a Pesticides Board which acts as the expert body in matters concerning pesticides. The Board is appointed for periods of five years.

47. Offences committed against the Finnish law on pesticides or regulations issued thereunder, including offences in the manufacture or importation of, trade in, or storage, transport or use of, pesticides are subject to punishment by fine or imprisonment.

48. Canadian legislation adopted in 1969 ^{57/} provides that where inspection of an agricultural product under Canada's Food and Drugs Act discloses pesticide residues that would make the product unfit for sale, and where the pesticide was used in accordance with the relevant recommendations, the Minister of Agriculture may pay to the farmer concerned compensation for any loss thus incurred by him. The Minister, among other things, must be satisfied that the pesticide residue is not present because of any fault of the farmer, his employee or agents or a previous owner of the land on which the product was grown.

49. Before payment can be made under this act, the farmer must take any steps deemed necessary by the Minister of Agriculture for the purpose of pursuing any action he may have in law against the manufacturer of the pesticide or against any person whose act or omission resulted in, or contributed to, the presence of the pesticide residue. The Minister, where he deems such legal action necessary, may, as a condition for payment of compensation, require the farmer's consent for the Minister to pursue that action on the farmer's behalf.

50. Appeals from compensation awards are heard and determined by an assessor or deputy assessors (who act in the event of his absence or incapacity), appointed by the Governor in Council from among the judges of the Exchequer Court of Canada and the superior courts of the provinces. Appeals may be brought by farmers, where no compensation was awarded or the compensation awarded was less than the

^{56/} Preparations containing classes of poisons under Finland's poisons legislation may not be sold until the Ministry of Social Welfare and Health, on the proposition of the Ministry of Agriculture, has authorized their use as pesticides.

^{57/} An act to provide compensation to farmers whose agricultural products are contaminated by pesticide residue and to provide for appeals from compensation awards, 8 May 1969. Text in FAO, Food and Agricultural Legislation, vol. XX, No. 1 (June 1971), part III/5.

maximum prescribed by law, on the ground that the amount awarded or the failure to award compensation was unreasonable. The assessor's decision is not subject to appeal or review by any court.

51. Action has also been taken in a number of States to regulate the addition of various substances to animal feeds, which was referred to in paragraph 33, above. For example, Austria, Belgium and Switzerland have prohibited the addition of hormones to feeds. They also require licenses or special authorizations for the addition of antibiotics to feeds. Belgium specifies the dosage of antibiotic that may be used for different species of animals. 58/ The European Economic Community has issued a directive concerning additives in livestock feed which specifies the substances that may be used as additives and the conditions which must be observed in their use. 59/

52. France has issued regulations concerning trade in irradiated food. 60/

53. The United Kingdom has prohibited the application of ionizing radiations for the preparation of food for human consumption and the sale or importation of irradiated food, except for food treated with not more than a specified dose. 61/

54. In the USSR, 62/ food standards known as All-Union Governmental Standards are issued by the Council of Ministers' Committee for Standards, Measures and Measuring Instruments. The individual republics also have authority to promulgate standards, which are brought into line with All-Union Standards. Where there are insufficient grounds for the establishment of All-Union Standards, the practice is to work out technical specifications jointly for a number of republics, or within a republic, or provisional specifications, which are binding on all industries to the same degree as All-Union Standards. Proposed governmental standards for a new food additive are approved only upon favourable advice of the Medical-Epidemiological Service of the Ministry of Health. The principle followed is that food additives which have not been authorized are forbidden.

58/ Ricard and French, *op. cit.*, pp. 11, 23-24 and 195.

59/ 70/524/CEE: Directive of the Council concerning additives in livestock feed, 23 November 1970; reference in FAO, Food and Agricultural Legislation, vol. XX, No. 1 (June 1971), part IV, chap. 2.

60/ Decree No. 70-392 of 8 May 1970, embodying administrative regulations for the implementation of the Act of 1 August 1905, on the prevention of fraudulent practices in trade in irradiated food likely to be used as food for human beings and animals. Abstract in FAO, Current Food Additives Legislation, 143 (30 April 1971), No. 1973.

61/ The Food (Control of Irradiation) Regulations 1967 of 13 March 1967, and amendment 1969 of 28 July 1969; reference *ibid.*, 144 (31 May 1971), No. 1988. Exception is also made for certain patients requiring a sterile diet.

62/ The following summary is based on information contained in A.I. Stenberg, J.I. Schillinger, M.G. Shevchenko, Food Additive Control in the U.S.S.R., FAO Food Additive Control Series, No. 8 (Rome, FAO, 1969), pp. 8, 10-12.

55. The conformity of foods with the standards for health and hygiene is verified through random analysis by the Medical-Epidemiological Stations of the Ministry of Health, which exist at the republic, municipal and local levels. Whenever a new method for preservation, colouring or other technological food process is elaborated by the food industry, calling for the introduction of an additive, preservative, colouring substance etc., for which no authorization has yet been issued by the health inspection bodies, the food industry concerned submits the case for decision to the Ministry of Health. The Ministry makes a decision on the basis of the conclusions arrived at by the research institutes and, if necessary, orders toxicological analysis and an evaluation of the carcinogenic risks from the newly proposed additives. The results of the investigations make it possible to determine whether the substance shall be permitted in food production and, if need be, its maximum permissible concentration in foods.

56. The United States has adopted nutritional guidelines for certain processed foods. The United States Food and Drug Administration issued guidelines on 30 November 1971 for frozen "convenience dinners", specifying the amounts of protein per 100 calories, vitamin levels and other ingredients which such packaged meals should contain to ensure a balance of essential nutrients. The guidelines will not be mandatory, but a product which complies will be allowed to carry a label saying that it conforms to federal nutritional standards. 63/

57. In 1970, the World Health Assembly, being concerned about the potential hazards of food additives to the consumer and agreeing that there was an urgent need for rapid dissemination of the results of toxicity research on food additives, requested member States of WHO to communicate immediately to that organization any decision to limit or prohibit the use of a food additive and to supplement such information as soon as possible with the data in support of the decision taken. It also requested the Director-General of WHO, where such action would be useful, to transmit immediately to WHO members information received concerning decisions to limit or prohibit an additive; to take expeditious steps to evaluate any significant new evidence of toxicity of a specific food additive; and to inform member States of any conclusions reached. 64/

63/ The New York Times, 1 December 1971, p. 55. Guidelines for other processed foods, including breakfast cereals and meat substitutes, were reported to be in preparation.

64/ Official Records of the World Health Organization, No. 184, Twenty-third World Health Assembly, part I, res. WFA 23.50.

B. Right to clothing

1. Existing international standards relating to the right to clothing

58. Clothing is also one of the factors enumerated in article 25, paragraph 1, of the Universal Declaration of Human Rights which, together, make up the "right of everyone to a standard of living adequate for the health and well-being of himself and his family". In article 11, paragraph 1, of the International Covenant on Economic, Social and Cultural Rights, parties recognize the "right of everyone to an adequate standard of living for himself and his family, including adequate... clothing...". 65/

2. Favourable impact of recent scientific and technological developments on the right to clothing

59. There is little need to emphasize the fact that clothing, more than being merely ornamental, is a basic human necessity in all but a few isolated or climatically favoured regions. Nor is there much need to elaborate upon the positive effects on the individual, in societies that require clothing for climatic or cultural reasons, of the easy availability of decent clothing. As has been pointed out:

"The clothes of the very poor, and the feeling of inadequacy or inferiority which is experienced by those wearing them, strongly affect their behaviour pattern. ...

"There is a valid lesson to be learned from our examination into the behaviour of people as a result of their clothing. If we want... self-reliant individuals... one of the ways to bring this about is by raising living standards so that all... people can afford to wear clothing which adds to their morale, dignity and self-respect. In the last analysis, a well-dressed population may not necessarily be a happy one, but it is likely to be far happier than an ill-dressed one." 66/

65/ For the complete contents of article 25, paragraph 1, of the Universal Declaration of Human Rights and article 11, paragraph 1, of the Covenant, see above, paragraphs 9-10.

66/ Lawrence Langner, The Importance of Wearing Clothes (New York, Hastings House, 1959), pp. 154-155. For a survey of the history, current developments in, and medical and social effects of, various types of clothing, see E.T. Renbourn, "Clothing: physiology, hygiene and psychological aspects", Current Medicine and Drugs (London), August 1964, pp. 3-31; September 1964, pp. 3-23; also Marilyn J. Horn, The Second Skin: an Interdisciplinary Study of Clothing (Boston, Houghton Mifflin, 1968).

60. The view has also been expressed that, within a given area, the greater availability of clothing at prices that everyone can afford tends, by diminishing outward distinctions among the various sectors of the population, to mitigate discriminatory tendencies. 67/

61. Scientific and technological developments undoubtedly have led to the greater availability of clothing at reduced cost, thereby furthering implementation of the right to an adequate standard of living in respect of clothing. This advance has come about, partly, by progress in agronomy and plants and animal sciences, which have been referred to above in connexion with the right to food and which have contributed to improvements in the production of natural fibres, particularly cotton, flax and wool, by technological innovations in textile manufacturing, and by the development of synthetic fibres and other synthetic materials.

62. Impressive advances have occurred in the production of apparel textiles. Sophisticated spinning and weaving machinery that is fully automated and can operate at very high speeds has been introduced in factories in many parts of the world. 68/ Advances in the dyeing process to increase the speed and the quality of dye absorbed, as well as permanent pigmentation, have been achieved through the development of complex dyes, covalent bonding and thermofixing processes. Electronic tensiometres and regularometres provide fast and accurate measuring devices in the modern textile factory. Beta radiation can be used to measure the uniformity of ribbons, roves and yarns. 69/ Lasers are being employed to cut cloth to a tolerance of 5/1000th of an inch, provide perfect fit in ready-made clothes and ensure that the fabric will not fray. 70/ Computers are also used in the cutting room, automating the cutting of varied patterns. 71/

67/ See, e.g. Langer, op. cit., pp. 102-103, 146.

68/ "Making clothes automatically", Engineering (London), vol. 208, 5 December 1969, pp. 592-593.

69/ "Current trends in scientific research" (E/3362/Rev.1), pp. 188-190.

70/ "Laser beam cuts garment cloth", Machine Design (Cleveland), vol. 43, 1 April 1971, p. 8; U.S. News and World Report, 18 October 1971, p. 86; New York Post, 16 August 1971, p. 2.

71/ D.H. Sorgan, "Computers in the cutting room", Control Engineering (New York), vol 16, October 1969, pp. 115-118.

63. Modern textile plants, varying in the degree of their mechanization and automation in accordance with local circumstances and requirements, have contributed to increased production of cloth in both economically developed and developing countries. 72/

64. According to data published in 1969, cotton still accounted for 80 per cent of the consumption of apparel in developing countries, but the production of cellulosic and synthetic yarns was spreading from the economically developed countries to all parts of the world. 73/ The proportion of cotton in textile consumption was expected to remain higher in developing countries than in the developed countries but, nevertheless, to show a decline. 74/ In India, for instance, it has been reported that

"Fabrics made of man-made fibres are gaining widespread acceptance and popularity among all sections of the population. Improvements in the techniques of weaving processing tend continually to enhance the qualities which render them more and more popular as well as economic. Even a decade ago, one was apt to regard them as luxuries. This is no longer so. On the contrary, they are fast taking their place among articles of mass consumption." 75/

65. World production of apparel cloth - i.e., cloth made of cotton, cellulosic, synthetic or wool fibres - rose from 8,610,000 tons in 1954 to 13,459,000 tons in 1966, with production in Africa, the Near East, Far East and Latin America rising from 2,104,000 to 3,841,000 tons during that period, according to estimates published by UNIDO. 76/

66. Increased international trade, due partly to technological advances, has given consumers in many countries a wider choice of clothing at low prices. In certain parts of the world, computers and other sophisticated techniques are used in retailing to provide useful data concerning demand for clothing products. 77/

72/ Industrialization of Developing Countries: Problems and Prospects - Textile Industry, UNIDO Monographs on Industrial Development, No. 7 (United Nations Publication, Sales No. 69.II.B.39), pp. 39-46. This publication is based on the proceedings of the International Symposium on Industrial Development, Athens, November-December 1967.

73/ Ibid., pp. 5, 10-11; estimated production of cellulosic and synthetic yarns in Africa, the Near East, the Far East and Latin America totalled, respectively, 369,000 and 133,000 tons in 1966 out of world totals of 2,599,000 and 2,306,000 tons, respectively (the latter figures exclude the centrally planned economies). As a generalization, the developing countries produce more cloth than yarn, importing synthetic fibres in particular (ibid., p. 7).

74/ Ibid., p. 30.

75/ S. Bhoothalingam, Demand for Man-made Fibres in India (New Delhi, National Council of Applied Economic Research, 1970), preface.

76/ UNIDO Monograph No. 7, pp. 10-11.

77/ "Computers have designs on the apparel business", Control Engineering, vol. 16, June 1969, pp. 175-176.

67. Considerable advances in the production of cellulosic man-made fibres (rayon) and the development of new synthetic fibres, known under such names as nylon, orlon, dynel, acrilan, dacron, have provided consumers with less expensive, colourful clothing, convenient and comfortable to wear and, in certain cases, wrinkle-free and wash-and-wear. The synthetic fibres are also more water repellant than most natural fibres and are not easily stained. Moreover, they are not subject to destruction by moths or beetles. 78/ Natural fibres, such as cotton, flax and wool, have also been fortified or combined with synthetic fibres to improve their quality. Progress continues to be made in developing fabrics that are waterproof, do not crease, burn, disintegrate or lose shape and require the minimum of attention for upkeep. This has been accomplished through the use of chromatography, electron microscopy, infra-red spectroscopy, X-rays, ultra-violet rays, ultrasonics, radio-isotopes, and high-speed cameras to study the properties of textiles. 79/

68. Synthetic materials have not only proved to be durable and efficient but can be made to look like more expensive fur or leather goods. Plastic non-woven materials, for instance, are being used to make jackets and coats. Plastic shoes and sandals reduce the demand on an increasingly inadequate supply of leather. Such shoes and sandals, as well as rubber footwear made by modern techniques, provide children and adults in many parts of the world with footgear they might not otherwise be able to possess. Plastic materials have also supplemented rubber products in wet-weather gear.

69. The research efforts connected with placing men in space, under water, in polar regions and in other hostile environments have led to specialized clothing that permits man to survive under conditions of weightlessness, extreme heat, great pressure and extreme cold; they have also resulted in safer and more durable clothing for the average consumer. 80/ One of the most significant advances has been the development of flame-retardant clothing. 81/ In this connexion progress has been made in developing more effective protective clothing

78/ Isaac Asimov, The Intelligent Man's Guide to Biological Sciences (New York, Washington Square Press, 1968), p. 63.

79/ "Current trends in scientific research" (E/3362/Rev.1), pp. 188-190.

80/ D.C. McNutt, "Protecting the sailor against cold", Proceedings of the Royal Society of Medicine (London), vol. 58, February 1965, pp. 97-98;
D.M. Herslake, "Heat balance in space suits", Annals of Occupational Hygiene (London), vol. 11, October 1968, pp. 337-338; "For fire-proof clothing manufacture" The Journal of the Illuminating Engineering Society (New York), vol. 64, April 1969, pp. 331-333.

81/ R.H. Johnson, "Breakthrough comes with heat-protecting fabric", Safety Maintenance (Morristown, N.J.), vol. 136, November 1968, pp. 18-20;
"New safety fabric withstands extremely high temperatures", Product Engineering (Hightstown, N.J.), vol. 41, 3 August 1970, p. 26.

for workers in hazardous occupations, ^{82/} and, in general, great progress has been made in designing more efficient and comfortable work clothes.

70. Research efforts have also led to the development of special clothing for the handicapped and the ill, for pregnant women and for children.

71. On a somewhat different plane, mention should also be made of the effects of the more wide-spread introduction of sewing machines in economically less developed regions. Use of these machines, which modern technology has rendered increasingly versatile, greatly enhances the ability of families to supply themselves with adequate clothing and, in certain cases, to earn some income by sewing clothes for other persons in the community.

3. Problems affecting human rights

72. Science and technology have undeniably contributed to the implementation of the right of everyone to adequate clothing. Problems in this field of clothing directly attributable to scientific and technological developments seem to be limited primarily to the fact that the qualities of the new synthetic substances may not always be fully known. Some of these substances have proven capable of harmful effects which, in certain cases, may reduce or nullify their intended contribution to a standard of living adequate for health and well-being. The problems that have been noted relate primarily to the inflammability of various synthetic substances and reactions of the human skin after prolonged exposure to them.

73. The new synthetic fibres - except for a few that are inherently flame-resistant - are considered to possess a somewhat lower potential for injury than cotton and rayon, which generally have the fastest burning characteristics; fabrics made of protein animal hair, pure silk and wool are considered the least hazardous of all. Man-made fibres, however, vary greatly in their burning properties, and, in addition to fibre content, such factors as the presence of pile or nap, the weave or fabric structure and the weight of the fabric must also be considered. ^{83/}

^{82/} "Keeping up with developments: protective clothing", Environmental Control and Safety Management (Morristown, N.J.), vol. 138, December 1959, pp. 50-53. "Keeping up with developments: protective clothing", Safety Maintenance, vol. 132, December 1966, pp. 29-33; vol. 134, December 1967, pp. 23-28; vol. 138, December 1969, pp. 50-53; "PVC clothing keeps linemen dry", Electrical World (Hightstown, N.J.), vol. 172, 7 July 1969, pp. 46-47; G.H. Farrah, "Heat stress protection for men in hot jobs", Safety Maintenance, vol. 134, October 1967, pp. 26-29; "Material, design tests produce protective sleeve for glass handlers", The American Society of Safety Engineers Journal (Park Ridge, Ill.), vol. 14, May 1969, pp. 14-17.

^{83/} Floyd B. Oglesby, "The flammable fabrics problem", Pediatrics, vol. 44, November 1969, p. 829.

Similarly, the type of dye and coating used have been shown to influence inflammability. ^{84/} Although, as has been said before, the new synthetics are usually considered to be less inflammable, "they tend to soften, some actually melting, to form a syrupy liquid or a sticky tar-like substance which may cause serious burns", ^{85/} and may also create a heavy toxic smoke upon ignition.

74. Children and incapacitated, elderly and sleeping adults are particularly vulnerable to clothing fires. Since the advent of flame-retardant fabrics, attention has been paid to the question of providing safer clothing, especially sleepwear. ^{86/}

75. Physicians have noticed a variety of skin irritations resulting from prolonged exposure to fabrics made from new synthetic substances. ^{87/} Medical journals report that the formaldehyde resins, which are used to make materials more dye absorbent, moth proof, less shrinkable or wrinkle resistant and to render creases in trousers permanent or to add a sheen and preserve the new appearance of garments after repeated cleaning, can cause severe cases of dermatitis. If the melamine or urea formaldehyde finish is not completely cured, i.e., baked on the fabric, it can react on the skin as an incompletely cured resin. Optical whiteners or lighteners in clothing can also cause low-grade eczematous dermatoses. ^{88/} A synthetic,

^{84/} J.R. Birch, "Flammable fabrics and human burns", Canadian Journal of Surgery, vol. 14, May 1971, pp. 177-178; G. Williams-Leir, "Deaths from clothing and bedding fires", Canadian Journal of Public Health, vol. 58 (1967), pp. 444-453; American Academy of Pediatrics, Committee on Accident Prevention, "Investigation of fabrics involved in wearing apparel fires". Pediatrics, vol. 34, November 1964, pp. 728-733. The Bulletin of the New York Academy of Medicine devoted its August 1967 issue (vol. 43) to 14 papers on the clothing fire problem presented at a conference on burns and flame-retardant fabrics held at the Academy in 1966.

^{85/} American Academy of Pediatrics, loc. cit., p. 728.

^{86/} J. Roche, "Inflammable nightwear", Medical Journal of Australia, 26 October 1968, p. 752; "Safety code for night clothes", Medical Journal of Australia, 13 September 1969, p. 528; "Fire-resistant garments", New England Journal of Medicine (Boston), vol. 276, 30 March 1967, pp. 752-753; "Safety clothes for Children", Good Housekeeping, vol. 169, November 1969, p. 203; "Children's protective garments", The Times (London), 29 July 1970, p. 5e; "Flame retardants", Chemical and Engineering News (Washington, D.C.), 18 October 1971, p. 16; "Mothers are willing to spend to protect baby", American Dyestuff Reporter (Easton, Pennsylvania), 2 June 1969, pp. 20-21.

^{87/} Etain Cronin, "Studies in contact dermatitis: dyes in clothing", pp. 156-164 and "Nylon stockings dyes", pp. 165-169; B. Batschvarov and D.M. Minkov, "Dermatitis and purpura from rubber in clothing", pp. 178-182; R. Marks and J.A. Savin, "Purpuric dermatosis of female traffic wardens", pp. 183-186 - all in Transaction of the St. John's Hospital Dermatological Society (London), vol. 54 (1968); H. Wilson "Dermatitis from dyed uniforms", British Journal of Dermatology, vol. 85, July 1971, pp. 67-69.

^{88/} Dr. Shellow et al. "Dermatitis from formaldehyde resin textiles", Archive of Dermatology (Chicago), vol. 94 (1966), pp. 799-801.

non-rubber elastic fibre made from polyurethane elastomers and used in brassieres, girdles, swimsuits, stockings and such knitted and woven goods as gloves, sweaters, sportswear, stretch-pants and blouses has been discovered to cause an allergic, eczematous, contact-type dermatitis in some persons. These substances are rapidly replacing rubber in such garments, as they have a longer stretch life and are resistant to abrasion, oils, chemicals, oxidation and sunlight. 89/

76. Dermatologists have also pointed out that fabrics made of synthetic fibres, especially where used for undergarments, permit less ventilation, prevent evaporation of perspiration or secretions, raise the humidity temperature of the sensitive body regions and, therefore, can give rise to fungical infections and skin diseases. The fact that, since the advent of the washing machine and synthetic fibres, articles of soiled clothing are no longer boiled before washing as previously, is considered by some doctors to have increased the danger of certain infections. Moreover, modern chemical detergents and bleaches may irritate the skin upon contact as may residues of such substances remaining in washed garments. 90/

77. Garments made from fabrics containing polyacrylonitrile and polyester fibres have been found in certain tests to be hygienically inferior to fabrics of pure natural wool. 91/ Synthetic winter clothing for children has similarly been found to cause a higher rate of perspiration. 92/ The problem of a higher rate

89/ Paul S. Porter and Robert S. Sommer, "Contact dermatitis due to spandex", pp. 43-44 and Robert F. Dickey, "Allergic, contact-type dermatitis due to spandex in brassieres", pp. 89-90, in Archive of Dermatology, vol. 95, January 1967; "Spandex dermatitis", Journal of the American Medical Association (Baltimore, Md.), vol. 200, No. 10, 5 June 1967; E. van Dijk, "Contact dermatitis due to spandex", Dermatologica (Basle), vol. 138, p. 340.

90/ M.J. Rachouchot, "Le contraire du progres: les sous-vetements et autres erreurs vestimentaires modernes", Bulletin de la Société Française de Dermatologie et de Syphiligraphie (Paris), vol. 74, pp. 376-378; "The panty girdle as a cause of genital irritation", Skin, vol. 3, June 1964, p. 182; "Hygienic studies of foundation garments", Japanese Journal of Hygiene, vol. 25, October 1970.

91/ V.S. Koshcheev, "Gigienicheskaya otsenka odezhdy iz tkanei, soderzhashchikh poliakrilnitril'nye i poliefirnye volokna" ("Hygienic assessment of garments made from fabrics containing polyacrylonitrile and polyester fibres"), Gigiena i Sanitariya (Hygiene and Sanitation) (Moscow), vol. 34, September 1969, pp. 126-128.

92/ G.V. Terent'eva, "Gigienicheskaya otsenka zimnei detskoi odezhdy na poralone" ("Hygienic evaluation of children's winter clothing processed with poralon"), vol. 29, February 1964, pp. 43-49; see also A.N. Braslavskii, "Hygienic properties of imitation leather obtained by gluing split leather to a textile base", ibid., vol. 32, March 1967, pp. 106-108.

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of perspiration caused by impermeable synthetic clothing is naturally exacerbated in hot countries. 93/

78. The questions concerning the nature of possible regulatory measures formulated in connexion with the right to food in order to identify and counter problems arising from the application of science and technology in that area 94/ also apply to some extent to problems like those discussed in the preceding paragraphs that affect the right to clothing.

79. The considerable popularity, for a variety of reasons, of modern "western-style" clothes, or adaptations thereof, in many parts of the world has resulted in certain areas in setbacks to the traditional styles of clothing, a development which is felt by some to be an encroachment upon the national culture. This popularity is due at least in part to increased contacts among different parts of the world by way of travel, film and television, which, in turn, have themselves been made possible by various scientific and technological developments. This problem of the juxtaposition of modern and traditional cultures is not limited to the sphere of clothing, however; it extends to such areas as housing or education and, in fact, encompasses the entire social, intellectual and emotional structure within which the individual exists.

93/ B. Knoche, "Die Bekleidung des Menschen in warmen Ländern, insbesondere in den Tropen unter Mitberücksichtigung der modernen Kunstfaserstoffe" ("Human clothing in hot countries, especially in the tropics, with reference to modern synthetic fibers"), Münchener Medizinische Wochenschrift, (Munich) 12 July 1963, pp. 1405-1411; B.D. Muminov, "K voprosu ob izuchenii svoistv tekstilnich materialov primenitel'no k usloviyam zharkogo sukhogo klimata" ("Studying the properties of textiles in relation to hot, dry climatic conditions"), Gigiena i Sanitariya, vol. 35, February 1970, pp. 113-115.

94/ See above, para. 43.

D. Legislation and other standards and guidelines

80. Below, briefly summarized, are samples of regulatory approaches that have been taken with a view to dealing with the problem of inflammability of fabrics, referred to in paragraphs 73 and 74, above.

81. In 1964, the United Kingdom issued regulations 95/ requiring, in effect, (a) that the material used in children's nightdresses comply with the requirements of the British Standard for fabrics described as of "low flammability" and that fabrics containing synthetic fibres must be made of substances that will melt with the application of heat; and (b) that children's nightdresses that have been treated with a chemical to make them safer from fire shall have durable labels stitched on to them, warning against washing the articles with soap or boiling or bleaching them. Local authorities may purchase goods for the purpose of a test, which is carried out at the authority's expense by a person or body so authorized by the Secretary of State.

82. These regulations were issued under the United Kingdom's Consumer Protection Act of 1961, which empowered the Secretary of State to issue regulations concerning the composition, contents, design, construction, finish or packing of any prescribed class of goods, or any component parts of such goods, "as are in his opinion expedient to prevent or reduce risk of death or personal injury". He was also empowered to impose requirements for securing that such goods or any component parts thereof would be marked with, or accompanied by, a prescribed warning or instructions. Before making such regulations, the Secretary of State has "the duty... to consult with such persons or bodies of persons as appear to him requisite". The power to make the regulations is exercisable by statutory instrument, which is subject to annulment by a resolution of either House of Parliament.

83. Sale or possession of goods, or component parts thereof, coming under such regulations is prohibited unless all requirements have been complied with. The obligation not to sell these goods constitutes a duty owed by the seller to "any other person who may be affected by the contravention of or non-compliance with the requirement in question". Breach of that duty is both actionable and a criminal offence carrying a penalty of a fine or, in the case of a second or subsequent offence, of a fine and imprisonment.

84. In the United States, the Flammable Fabrics Act of 1953, amended in 1967, 96/ prohibits the manufacture, sale and importation for sale of products of fabrics that fail to conform with flammability standards or other regulations issued under that Act by the Secretary of Commerce. The Secretary's findings are made on the basis of investigations or research conducted by the Secretary of Health, Education and Welfare in co-operation with the Secretary of Commerce. The

95/ Children's Nightdresses Regulations 1964.

96/ United States Code (15 U.S.C., chap. 25, sect. 1191-1204).

latter is to institute "proceedings for the determination of an appropriate flammability standard", including conditions and manner of testing, whenever he finds, on the basis of the above-mentioned tests, that such standards or other regulations, including labeling, may be "needed to protect the public against unreasonable risk of the occurrence of fire leading to death or personal injury, or significant property damage". The standards and regulations issued must be based on findings that, in addition to the consideration cited in the preceding sentence, they are "reasonable, technologically practicable, and appropriate".

85. The Act also requires the Secretary of Commerce to appoint a National Advisory Committee for the Flammable Fabrics Act, consisting of not less than nine members. The Committee, which is to be "fairly representative of manufacturers, distributors and the consuming public", is to be consulted by the Secretary before he prescribes flammability standards or other regulations under the Act.

86. Wilful violation of the above-mentioned provisions governing manufacture, sale etc. is punishable as a misdemeanor and subject to a fine or imprisonment, or both.

87. Any person who is adversely affected by such a standard or regulation may (in addition to other remedies that may be provided by law) ask the competent federal court of appeals for a judicial review thereof. The judgement of the appeals court is final, subject to review by the Supreme Court. 97/

88. The Federal Trade Commission is authorized to have inspections and tests made of goods it has reason to believe to be prohibited under this Act, and it may institute, in the competent federal district court, proceedings for the seizure and confiscation of such goods. Provision is also made for injunctions and temporary injunctions.

89. A "Standard for the Flammability of Children's Sleepwear", which was issued under the Act, on 27 July 1971, included specifications as to testing procedures and labelling requirements. 98/ All goods manufactured 24 months after promulgation of the standard are required to comply, conspicuous cautioning labels being required for non-complying goods during an interim period of 12 months between the entry into force of the standard and final prohibition of non-complying goods.

97/ Upon certification, as provided in 28 U.S.C., sect. 1254.

98/ United States, Federal Register, vol. 36, No. 146, pp. 14062-14065.