

Developments in Science-Technology  
and New Threats to Peace

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Science Council of Japan

**The Special Committee on Developments in Science-Technology  
and New Threats to Peace**

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## Developments in Science-Technology and New Threats to Peace

### **1. A background perspective on this report and its aims**

The 20th century has truly been an age of war, as symbolised by two enormously destructive world conflicts. While well aware of the conventional understanding of "war" as direct engagement in military violence, we are also convinced that the task of comprehending and resolving international strife increasingly calls for a broader vision of its nature and causes. The new threats to long-lasting peace are both global and multifaceted, arising from hunger and poverty, social discrimination, poor hygiene, ill-health, destruction of the environment, and various forms of dehumanisation.

The stark reality is that most of these evils cannot be separated from developments in the natural sciences. While they are not, of course, by themselves the primary cause, this report explores just how they have been contributing factors.

### **2. The contents**

In the original Japanese, the report consists of five chapters. The first ("The Goals of the Committee") clarifies the mission of the committee in its examination of how scientific and technological developments and the new threats to peace are causally related. The second ("Views Old and New") examines how the peace problem has been defined, both as it has been traditionally understood and as it must now be seen in light of new perils in today's world, and how the two perspectives are interrelated. The third ("Concrete Examples") offers what are becoming virtually universal concerns in the lives of the world's citizenry, including problems related to such areas as: (1) global warming and energy consumption; (2) nuclear weapons and waste; (3) the global food supply; (4) water resources and pollution; (5) waste and recycling; (6) genetics; (7) endocrine disrupters; (8) the information society as the offspring of computer technology. The fourth ("Social Responsibility of Science and Scientists Regarding New Threats to Peace") examines what scientists can and should do to fulfil their social responsibility in facing the present dangers. The fifth explores in more detail the eight areas presented in Chapter 3, including definitions of the issues and their parameters.

### **3. Eight Specific Examples of Developments in Science-Technology and New Threats to Peace**

#### **(1) Global Warming and Energy Consumption**

There is growing evidence that a significant cause of the increase in the atmosphere's share of carbon dioxide is the increase in our consumption of fossil fuels. Japan must actively join in the effort to eliminate the wasteful use of energy and to exploit alternative sources, notably hydrogen and reproducible energy. "System energy" technology is also needed in order to make use of warm water exhaust resulting from the production of electricity.

#### **(2) Nuclear weapons and waste**

Despite the end of the Cold War, the danger of mass destruction through the misuse of nuclear materials, deliberate or accidental, remains. Nightmare scenarios range from computer error, to terrorism, to inadequate safeguards regarding plutonium processing. Safe as well as peaceful uses of nuclear energy must also be pursued.

#### **(3) The global food supply**

Even as the world's population continues to grow, the number of human beings engaged in agriculture is falling. Despite improvements in agricultural technology, such will not keep pace with the spectres of soil erosion, desertification, and salinisation. Global stagnation in food production is expected. Furthermore, the imbalance in food import dependency among nations remains a serious problem. A worldwide ban on the use of food as a weapon is needed.

#### **(4) Water resources and pollution**

Water pollution is an increasingly grave problem in both the developed and the developing nations. A major cause is the rising concentration of nitrates and phosphates brought about by industrial development along waterways, the growth in human and animal, and increased use of fertilizers. Solving the problem requires not only treatment of polluted water but also recycling and conservation, together with an overall change in lifestyle.

#### **(5) Waste and recycling**

The disposal of general and industrial waste looms as a two-headed monster. Incineration without strict safeguards produces carcinogenic dioxins; burial likewise poses an environmental hazard. The safety of land reclamation projects that make use of refuse has also become a social and political issue. Human populations contribute to the pollution and, in turn, are victimised by

it. Their role in remedying it is therefore essential.

#### (6) Genetics

The chemical and biological cracking of the genetic code offers both great promise and great peril. The issues raised by the new technology range from safety to ethics. International agreements, again based on consultations with scholars in various fields, are necessary to insure that our new knowledge and capabilities are not used for corporate profit, nationalistic aggrandisement, or other short-sighted goals.

#### (7) Endocrine disrupters

It has become apparent that the absorption by human beings and animals, even in minute quantities, of chemical substances intended to make life more comfortable and convenient has resulted in endocrine disruption. This growing threat must be addressed with accelerated research and measures to combat it.

#### (8) The information society as the offspring of computer technology.

Within the last decades the computer has become part of the everyday lives of people throughout the world, resulting in a unprecedented flood of information exchange. The global, borderless society that this new technology has brought also poses new challenges. Efforts are urgently needed to prevent its misuse by criminals and terrorists and to insure that individual privacy is protected.

### **4. The Social Responsibilities of Scientists and Engineers**

One strong incentive for exploring and examining the various issues that pose new threats to peace stems from the undeniable fact that heretofore the world of science and technology has tended to "go it alone," to act as if it were somehow operating in a social and moral vacuum. As this report demonstrates with numerous and detailed examples, advances in the various fields of science and technology have actually led to global deterioration, in regard to both human dignity and the overall security of life. It is essential that present and future scientific research should directly confront the various problems that are occurring in contemporary society and seek to advance co-operative efforts between the natural sciences and those disciplines that include both the humanities and the social sciences. It is imperative, it must be emphasised here, that all research endeavours be undertaken from an integral perspective, that is, taking into full account a comprehensive view of science in both outlook and methodology. Without a fervent and constant eye on that principle in all its work, the scientific community will fail to fulfil its social responsibilities.

In order that scientists and engineers might better be able to carry out these duties regarding the new perils to peace being outlined here, we wish to propose the following for consideration:

(1) It is vital that scientists and engineers themselves should be ever wary of the potential hazards posed by their own research, always reflecting on past errors and alert to new and different dangers. Moreover they must also endeavour to direct their research towards a positive contribution to the elimination of new threats to peace. It is only in this way that the field of science and those who work within it can carry out their duty to society and their fellow citizens.

(2) This necessarily also calls for joint research between the natural sciences on the one hand and the humanities and social sciences on the other. For example, in regard to food resources, they must work together to develop new agricultural technologies in order to meet and defeat the threat of land devastation. At the same time, it is vital to find means to prevent the manipulation of food supplies as a global strategic weapon; to that end efforts must be made to establish a firm international framework and binding worldwide treaties. This is clearly not only the responsibility of those in the natural science disciplines but rather again calls for the cooperative endeavour of experts in the humanities and the social sciences.

(3) In light of the widely recognised perils faced in the modern age, it is hardly surprising that many people are seeking to turn their backs on the comforts and conveniences provided by science and technology, rejecting dependence on "materialistic civilisation" and proclaiming their desire to "return to the land" and "to live harmoniously with nature." Scholars in the humanities and social sciences must take it upon themselves to examine the shift in popular thinking away from consumerism to what, in a positive and meaningful sense, can be termed "spiritual civilisation."

(4) As part of the search for solutions to all the various new challenges, a new and revitalised "peace movement" as a broad social endeavour will play a most significant role. The scientific community will have the responsibility of providing scientific data as well as of giving the cause their own personal support. In this regard, journalists should be mentioned as fulfilling a vital mission in providing relevant information, particularly in the area of scientific reporting.

(5) We must also examine the nature of our educational system. It is highly desirable and indeed essential that researchers in all fields gain and demonstrate knowledge (scientia) in its broadest sense, transcending the conventional distinction between the natural sciences on the one hand, the humanities and social sciences on the other. Those engaged in the former

should develop a genuine sympathy and respect for the latter, who, in turn, should make a greater effort to be "scientifically literate." To that end, we must endeavour to structure our institutions of higher education to offer a "practical liberal arts" education in the best and truest sense of the term.