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Outline of
Public Attitudes
on Science and Technology
～ based on Opinion Survey Results ～

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<Note>

In this report, most of the data concerning Japanese attitudes are based on the opinion surveys conducted by the Public Relations Division, Prime Minister's Office unless otherwise indicated. International comparative data are mainly taken from "Opinion Survey of Science, Technology and Society (March 1987)" and "Opinion Survey of Environmental Problems (January 1988)".

Public Attitudes
On Science and Technology
-- on the basis of "Opinion Surveys" --

Preface

Tremendous progress of science and technology in the recent years has given rise to various issues not only in our economy and industry but also in more diverse areas of politics, medical care and other social and cultural activities.

Moreover, these issues extend beyond national boundaries and exert significant influence internationally. Thus, it is natural that the advance of science and technology has had far-reaching impacts on people's views, and this in turn stands to directly influence the progress of science and technology.

As we approach the third millennium, nations are finding a greater array of common areas of interest, be they material or otherwise. In such an environment, and because science and technology are intrinsically universal, it is considered to be an important task to have a correct understanding of people's feelings and thoughts about science and technology both in view of the nature of the domestic issues as well as in their role to promote or inhibit international exchange. In addition, this understanding will provide a valuable means to reflect on the needs to establish harmony between science and technology and society at large.

Based on such a point of view, the 2nd Policy-Oriented Research Group of the National Institute of Science and Technology Policy (NISTEP) has collected information and data concerning people's views (opinion and attitudes) toward science and technology. By compiling and analyzing the data, we expect to be able to study the nature of people's attitudes, including social-psychological aspects in regards to science and technology.

The present report is no more than a starting point. It is our intention to promote cooperation with various institutions and researchers in this field. This will include continued study of issues such as “science literacy” and “public acceptance”, i. e., the relationship between society and science and technology. Internationally, we expect to work closely with a number of overseas experts so that an international network can be organized.

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1. Short summary

(1) Concerns and Impression of Science and Technology

The results of the “Opinion Survey on science, Technology and society”, which was conducted in march 1987, showed that the majority of people polled(52.4%) are interested in science and technology. The proportion of “those people who think more positive effects have been brought about with the development of science and technology” (54.3%) is far higher than the number who think “the degrees of positive and negative effects are almost the same” (28.7%) and with those who think “there are more negative effects” (8.3%).

However, the opinion survey also disclosed that few people believe that science and technology has the potential to solve all human problems: 85.5% of the people polled hold the opinion that “the development of science and technology cannot clarify understanding the complexities of the human mind” and 63.8% were of the opinion that “science and technology cannot solve most of the economic and social issues that we encounter”.

Those people who think the development of science and technology has improved the standard of living, working conditions and the ammenities of individual life are 73.5%, 39.9% and 45.5% respectively. However, 49.5% of the people polled think the development of science and technology has not changed or has worsened working conditions, and 43.0% take the same negative view toward the ammenities of individual life. On the question of morality, 5.2% of the people believe it has been improved, while 42.2% think it has been worsened. (refer to chart 1-1)

When questioned about concerns over the development of science and technology, many people voiced anxiety: 82.8% were concerned about “the danger of misuse and abuse of science and technology”, 69.5% were worried about the “deterioration of human capacities for locomotion and for living”, and 65.7% voiced concern over “specialization of knowledge along with the fractionization of science and technology, and the difficulty in understanding other fields outside of one’s own”.

Regarding what areas should be developed by science and technology in the future, the answers of those polled indicated a growing interest of people in such fields as health and medical care which directly influence their lives.

They chose the following fields; “developing psychology and medical science which assist in maintaining healthy minds” (36.8%); “developing artificial organs” (38.5%), “developing food resources” (24.7%) and “developing home information system” (24.3%). (refer to chart 1-2)

(2) Changing Attitudes on Science and Technology

<1> Changing attitudes on Science and Technology

Attitudes on interest in science and technology have been over the years. In a survey conducted in 1976, the number of people who showed interest in science and technology was 62% (including those who had much interest and those with some interest). In the 1981 survey, the figure dropped to 52% (9.0% for those, and 43% indicated some interest) and to 47.5% (those with much interest 10.0%, with some interest 37.5%) in the survey in 1986. The figure in the 1987 survey rose a little to 52.4% (much interest 9.9%; some interest 42.5%) (refer to chart 1-3).

In all of the surveys, men showed advanced interest in science and technology than women (e. g. men 68.1%; women 38.6% in 1987 survey); people with a high educational backgrounds also showed high interest.

<2> Opinions on Environmental Protection in Relation to Economic Growth

In surveys on the economy, industry and environmental protection related to science and technology, more than 40% of the people agreed that “a certain degree of pollution is inevitable in industrial development, but compensatory actions must be taken” in the early 1970’s (1971). In the later part of the 1970’s and in the 1980’s, the number of people who placed primary importance on economy and industry and not on environmental protection declined. The views expressed were: “It is important to save nature and the living environment, but it is not desirable if the growth of the Japanese economy is slowed” 23.6% (1980); “It is good to have economic development even if it might somehow affect the environment” 11% (1982) and “Economic development takes priority over protecting nature” 6.9% (1987).

<3> Others

In the surveys on public attitudes on science and technology, the same question -- “Do you think that the country is going in the right direction? If so, in what way?” (multiple answers) has been asked in all surveys since 1981. The results show that the number of people who think the country is going in the right direction generally exceeds those who think otherwise: the survey conducted in 1986 showed 37% vs. 35%; in 1987, 43% vs. 29% respectively. However, the number of people who think that the country is going in the wrong direction has remained constant at around 30% to 40%.

On science and technology, the number of those who support its direction has gradually increased: from 22.4% in 1981 to 28.5% in 1987, and the number of people who think science and technology is going in the wrong direction is low (at maximum, 1.2% in 1986).

Those who believe the economy is heading in the right direction have remained fairly constant at 30% to 40%. However, there are number who hold the opposite view: 16.7% in 1982, 14.6% in 1986. There is a remarkable difference in evaluation of the economy and science and technology. As for resources and energy, those who think the nation is going in the right direction remain constant at 4 to 5%. However, those who believe the country is erring in these areas have declined from 26.6% in 1981 to 14.6% in 1987.

(3) Conclusion

In considering the findings of the opinion surveys, the Japanese people generally have a relatively high interest in science and technology and they strongly believe that science and technology is going in the right direction and is that it is contributing to the improvement of human life. At the same time, they pay considerable attention to the negative factors of science and technology. The surveys also show that people want the development of science and technology in such fields as health and medical care which have a direct relationship to their lives.

2. Public Attitudes on Information(Joho-ka) Society

(1) Recognition and Impression of Information(Joho-ka) Society

First, it would be necessary to describe what “Information(Joho-ka) Society” means. Unfortunately, there is no general agreement on a clear definition of the term, and as such, we must be content for a time being, to interpret “Information(Joho-ka) Society “ as a society in which “the circulation of information is highly developed”.

An opinion survey conducted by the Prime Minister’s Office in July, 1985 shows that 84.2% of respondents are aware of the term “Information(Joho-ka) Society”. In the previous survey made five years earlier in February 1981, the percentage was 75.1% . Therefore, the recognition rate increased 9.1% in these five years.

In the latest survey, 76.7% respondents thought they were already living in an information(Joho-ka) society. The ratio is highest among younger males (Fig. 2-1). This trend also applies to the recognition ratio of the term “Information(Joho-ka) society”.

As to their impression of information(Joho-ka) society, respondents were asked a series of questions. 47.0% felt that there was an “excessive amount of information”, 35.4% said they vaguely felt to be benefiting from it, while 18.3% thought that they had not much to do with it. This shows that while the term is known to the vast majority, “Information(Joho-ka) society” has not yet become a fact of everyday life to the population (fig. 2-2).

In 1985, Tokyo Metropolitan Government conducted a survey on people’s expectations and concerning Information (Joho-ka) society. According to the survey, most people wanted “accuracy” and “promptness” - i. e., utility of information, as well as “availavility of public funding and easy access by aged groups to social activities”. On the other hand, many felt uneasy about “faults and errors caused by computer”, “computer-related crimes”, “violation of privacy” and “loss of humane sensibility” (Table 2-1, 2-2).

(2) Recognition of Computer Diffusion

Advance and diffusion of computers are clearly the cause of development of information (Joho-ka) society. What do people think of computers?.

First, as to the necessity of computers, an opinion survey in 1976 showed that 46% answered “computers” were indispensable”. In subsequent surveys, the ratio went up to 86.4% in 1981, but edged below to 78.1% in 1985. However, it is clear that more and more people are convinced that a computer is a must in today’s society.

A comparison of the 1981 survey to that of 1985 regarding various opinions on computers (Fig. 2-3) shows that growing number of people think that “a computer could be good or bad depending on who is using it”, or that “there are increasing risks”,. It also shows that less and less people hold a simplistic view that computers are just “convenient”. It is also interesting that the ratio of surveys stating that “computers are not really friendly” remains constant. It appears that as computers are 'invading' society, people have become more cautious, and that they are carefully watching, to what extent the computer brings them any real benefits.

(3) Attitudes to Infringement of Privacy through Computer Systems

The opinion surveys indicate that the number of people who have serious interest in the question of privacy and computerization is greatly increasing 23% in 1976, 60.5% in 1981, and 62.0% in 1985. This reflects the fact that from the latter half of 70's, utilization of computerbased data bases and online systems continued at an unprecedented pace, and because of that, people's awareness of privacy as a social issue grew rapidly. On the other hand, to a question “Are there more cases of privacy infringement ?” , 31% said yes in 1981 and 48.2% in 1985. In 1981, 49% did not think so, but the ratio decreased to 33.8% in 1985.

Also, in the 1981 survey, there was not much difference among age groups in their positive/negative attitudes on this question. The 1985 survey shows that the concern over privacy infringement was much higher in the younger generation. As to people who thought there was privacy infringement, while the ratio increased overall, it was the highest among young people. This suggests that infringement of privacy is thought to be more frequent among younger people who are more exposed to computers (Fig. 2-4).

With regard to a question relating to computer-based handling of personal data and its risks of privacy infringement in the future, 57.5% said the risks would be greater in 1981, and 70.6% in 1985- -an increase of 13%. Very few people said that the risks would decrease in both surveys, but those who answered "I don't know" decreased 3% from 18% in 1981 to 15.1% in 1985 (Fig. 2-5).

These two surveys are not sufficient to form any definite view on the public attitudes, although the accelerating development and scope of use of computers are resulting in the fact that more and more people, especially young people, are becoming familiar with computers, and this is likely to influence their attitude towards the computer related privacy issues.

3. Public attitudes on Nuclear Power Generation and Energy Problems

In the recent years, the matter of utilization of nuclear energy has given rise to a large number of arguments both in Japan and abroad due to the major accidents at TMI and Chernobyl nuclear power plants. In this section, we will discuss various trends on public attitude in Japan concerning nuclear energy as seen from the opinion surveys made in the last ten years.

(1) Attitudes and Knowledge of Nuclear Power Issues in 1975

An opinion survey conducted in October, 1975 showed that to a question “what type of electric power generation will become the most important area for future development?”, 48.4% mentioned nuclear power plant, by far the majority. Other responses included solar energy stations (8.4%), thermal power stations(7.9%), hydroelectric plants (4.9%), geothermal plants (1.1%) (Table 3-1). A fairly large number of respondents (29.1%) said they did not know. The ratio of people who held nuclear power at the top increased among young people.

Next, to a question “What do you think of the nuclear power for the future?”, 38.5% replied that more positive efforts should be made for development of nuclear energy. The ratio is far above of more conservative views such as “it would be better not to pursue nuclear energy development” (18.3%) and “we had better stop using nuclear power plant” (9.3%), although fairly large number of respondents (33.9%) said they did not know.

As to the reason why “it is better not to promote development of nuclear plants”, 44.3% gave lack of credibility on the safety of power generation facilities, followed by “lack of confidence in reliability of processing of nuclear waste and heated water”(32.5%) and “concern over possible accidents caused by earthquake and other calamities” (18.5%).

When asked about their knowledge on the principle of nuclear power generation, 60.3% of the respondents said they “didn’t know”. Only 2.4% replied they knew well, while 37.3% replied that they had some knowledge. Thus, 39.7% felt they were not quite knowledgeable, and their knowledge came mostly from the mass-media.

(2) Influence of the TMI Accident

Surveys were conducted monitor the public attitudes towards the impact of the Three-Mile Island accident which occurred in March 1979. In the opinion survey of December 1979, 76.6% replied they were aware of the accident and 23.4% said they did not know. The first group was then asked if “the accident resulted in emission of radioactivity outside of the nuclear station”, and 69.9% replied that they thought so. These respondents were subsequently asked to estimate the maximum radioactivity level the TMI inhabitants had been exposed to : 12.9% believed the level was equivalent to that “in the course of treatment of cancer”, to the level of “one X-ray gastric check:5.5%”, to the level of “one X-ray chest check:6.3%”, while 5.0% thought the level was about “10% of one X-ray chest check”. 64.1% said they had no idea.

To a question “what will be the most important source of electricity supply in future”, only 32.5% of the February 1980 survey respondents mentioned nuclear power, while those who favored solar generation significantly increased to 27.7%. However, in a similar survey made in November of the same year, the trend was reversed to the pre-accident level, as 46.6% thought the nuclear energy would be the most important source (table 3-2). Also, with regard to the share of nuclear energy to total consumption, 37.8% replied that the share of nuclear energy should go up, ahead of more conservative views such as “the current share should be maintained” (28.3%) and “the share should come down” (5.2%). Asked if they were concerned over nuclear energy, 55.6% said they were worried, exceeding the number of people (44.9%) who were not worried. Among the worried group, the majority was afraid of radioactive emissions, followed by “unseen accidents”, “safety of reactor and other facilities”, and “stocking, processing and disposal of wastes”. Thus, the public attitude to these issues remain more or less the same during 1980 to 1985.

(3) Influence of the Chernobyl Accident

In the August 1987 survey, 92.9% of the respondents said they were aware of the Chernobyl accident in April 1986, while 7.1% didn't know. Compared to the result of 1979 survey on TMI accident, we can see that public awareness was significantly heightend. Moreover, those who said they were aware of the accident, about two-thirds replied that they talked about it with others at home and workplaces, indicating that the calamity had a major impact on people's consciousness (Fig. 3-1 and 3-2). To a question “what is the most important means of power generation in Japan today?”, 39.5% mentioned thermal power generation using oil, followed by hydroelectricity (27.9%) and nuclear energy (17.3%), indicating that the public became more aware of the share of nuclear energy in contrast to the earlier surveys (Fig. 3-3).

To another question, “what will be the most important means of electricity generation in future?”, 60.6% were for nuclear power, followed by solar generation (10.7%) and thermal generation (7.4%). Thus, the majority thought that nuclear energy would still be the main source of electric power in future (Fig. 3-3). At this point, the respondents were reminded of the fact that nuclear power was supplying 27% of electricity in Japan, and were asked if they were in favor of continuous growth of this share. To this question, only 6.7% replied that they supported further development of nuclear power generation, while 50.1% said that expansion of nuclear power generation must be done cautiously, 23.2% were of the opinion that no more increase should be allowed, and 4.5% thought that nuclear power generation should be reduced. The majority, therefore, still are in favor of promoting nuclear power generation (Fig. 3-4).

Since 1978, the Asahi Newspaper conducted eight opinion surveys on the issue of nuclear power. They show clearly that people who support development of nuclear power, are gradually decreasing after the peak (62%) reached in 1979. In September, 1988 or two years after the Chernobyl accident, those who were against (46%) topped those favoring nuclear power (29%). In particular, with regard to the safety of nuclear stations, the survey made in June, 1979 immediately after the TMI accident showed that 52% thought “nuclear stations could be made safe by adequate technique and supervision”, while 33% believed that the “potential risks were too great to be eliminated by technology”. On the other hand, according to the September 1988 survey, the optimistic view decreased to 32% and the pessimistic opinion grew to 56%. Clearly, the Chernobyl accident caused a major change in the public opinion.

(4) Attitudes and Knowledges of Nuclear Power Issues in recent years

A number of opinion surveys have been made since the oil crises concerning energy saving and other energy-related policies. Throughout the surveys, the opinion saying “we should sacrifice our standard of living to avoid increase of energy consumption” has been consistently 10% or so, while the absolute majority --70 to 80%-- believes either that “while we must save energy, development of new energy sources is necessary in case of shortage” or “if necessary, we must develop new energy sources” (Table 3-2).

Thus, as the majority of the public believes development of new energy sources is essential, at least 50% holds that nuclear power will be the main source of energy supply in future, and so far as the survey results are concerned, it seems that there has been no basic change in this attitude, even after the serious accidents at Three-Mile Island and Chernobyl. In fact, a survey done by the Asahi Newspaper in September, 1988 shows that to a question “what should be done about nuclear power generation in Japan?”, 55% said that the current level should be maintained, while 17% were for gradual decrease and 10% was for abandoning; on the other hand, 9% stated that dependence on nuclear power should be increased.

4. Public Attitudes on Life Science

Life science is considered as an essential discipline to enhance human welfare. Applications and developments in the areas of medicine, food and energy supply are eagerly awaited, and in most advanced countries including Japan, serious efforts are being made to develop it as one of the top priority science areas for the 21st century. In this section, we shall see how the Japanese public regards the development of life science and its impact on everyday life.

(1) Attitudes and Knowledges of Life Science

According to the opinion survey in December, 1985, 86.8% of respondents said they had “read, saw or heard about the life science achievements”, while 7.3% replied they had never heard or seen such things. Among those who were aware of life science, 75.2% gave as examples “birth resulting from artificial fertilization”, 73.0% “artificial hearts”, 43% “use of waste and refuse as fuel” (energy source), 40.1% “treatment of cancer and hereditary diseases”, 36.0% “plant bearing a vast number of fruits” (plural answers- -fig. 4-1). Because of such strong interest held by the majority of public, there is a very high expectation of future advancement of life science. 82% of people polled stated they “look forward to it”, while only 4% replied they had no such expectation. “Treatment of cancer and hereditary diseases” was the most favored application (45.3%) followed by “prevention of environmental pollution” (13.0%), “improvement of living standard” (11.2%), “promotion of new types of industry” (4.9%) , “increase of food output” (4.2%), and “development of new products”(4.1%). (Fig. 4-2)

Asked if they expect significant change in life as the result of progress of life science in 15 years to come, 69.3% said “life science will allow people to protect themselves against diseases”, and 68.8% thought “it will make people live longer”. 49.3% replied that “people will have different ideas about household work and care taking of children”, and 50.2% was of opinion that “it will change their eating habits”. The fact that the majority of public believes in the large impact of life science on their life suggests that they accept the changes in social life, which are believed to be at the root of various issues already in existence, to continue in future. (Fig. 4-3)

(2) Life Science and Medicine

Because medical care is the first and most effective application of life science, a survey was made to see public interest in life science in conjunction with medicine. More than 60% of the respondents showed interest in the following: “brain death” issues (66.0%), “prolongation of life after brain death” (63.4%), “organ transplantation” (60.1%), “artificial organs” (60.0%). On the other hand, 62.3% said they were not interested in “artificial fertilization”, 49.9% in “cell fusion” and 47.6% in “gene recombination” (Fig. 4-4).

In this survey, respondents were asked if they approved “human feotal sex checks” and other practices. The majority said they would accept “pre-natal diagnosis” (63.3% against 24.7%) and “treatment of defective genes” (45.7% against 29.5%), while negative opinions prevailed on such issues like “in-vitro fertilization” (28.0% against 54.8%) and “feotal sex check” (35.7% against 53.7%) (Fig. 4-5).

In order to see public attitudes to another application of life science - to prolongation of life, respondents were requested to state whether they would personally accept intensive and artificial life support measures. To this question, 59.6% said they “do not want such treatment because one should not artificially try to prolong life beyond a certain limit”, while 32.1% were of the opinion that “ science and technology should come into full play if they could serve to prolong life”. Women tended to be more sceptical about such measures (61.8% of them were against) than men (56.8%), and this attitude was more prevalent among older and less educated groups. Men tended to be more in favor of the use of technology than women (36.0% against 28.9%), and this attitude was conspicuous among younger and better educated groups (Fig. 4-6).

(3) Attitudes towards Brain Death and Organ Transplant

As mentioned in (2), the public showed a strong interest in brain death issues. To a question “should brain death patients be considered dead?” in the survey made in June, 1987, the largest number of respondents (36.7%) said “this is a matter which should be left at the discretion of each individual in question and to his or her family”. On the other hand, the number of people who thought that “brain death should be interpreted as death” and “a person should be considered to be alive so long as his heart is functioning” were almost equal (23.7% and 24.1%, respectively) (Fig. 4-7).

As to donation of body organs at the stage of brain death, the majority --51.9%-- felt that this again was the matter to be decided by each individual in his testament or by the wish of his or her family”, although those who approved of donation of body organs surpassed those who were against it (17.8% versus 13.5%). We cannot make a straight forward comparison of this with an earlier survey done in December, 1980 because of the difference in setting of alternatives, but it is interesting to note that objection to organ transplant decreased significantly in five years from 45.9% to 13.5%, indicating a high degree of public interest and acceptance in this issue (Fig. 4-9).

In the same vein, those who would want to get organ transplants in case of absolute need increased from 41.8% to 47.9% in the same period, while those who did not want to have organ transplants at any time decreased from 41.9% to 33.2%. The opinion in favor of organ transplant was higher among younger people (Fig. 4-9).

The Yomiuri Newspaper conducted several opinion surveys on this issue, and the results shows that public acceptance of brain death as the real end is increasing in the recent several years. In November, 1985, 42.1% were of this opinion, whereas 31.8% held negative view on this (Fig. 4-10). The survey contained a question “what would you do if someone very close to yourself is in the state of brain death and request has been made to donate an organ from that person?”, about 40% replied that they would agree to donation, some on conditions such as the person’s prior consent or closeness of the recipient to the grantor. Slightly more than 20% were against. There was no marked variance in this proportion from one survey to the other (Fig. 4-11).

Asked about their own intentions in the event that they need organ transplants to improve their chance of survival, almost 40% of the respondents in the 1985 survey took a positive view --25.6% said they would accept such transplant regardless of who the donor could be, while 13.6% replied they wanted transplantation if the organ was from their kin or close friends, against 17.7% who stated they would refuse transplantation under any circumstances.

(4) Attitudes towards Life Science Research

In consideration of the strong interest of the public in life science, an opinion survey was conducted to see attitudes towards the way life science research should be carried out and social utilization of outcome of the research. The largest number of respondents --42.6%-- were of opinion that “both the research and use of life science should be promoted, but only with the public understanding their implications”. 21.7% thought that life science research must be conducted with support of the public, and 9.5% replied that “research and utilization should be free from restrictions”. On the other hand, 3.5% were of opinion that “there should be no restriction on research, but social use of the technology must be forbidden”, and 1.2% said that “life science research and use of the technology should be prohibited” (Fig. 4-13).

Among sex groups, age and educational background, men outnumbered women in the majority opinion (need for public understanding). Also, this opinion was particularly stronger among the people who were in their 30s and 20s, and among those whose educational levels were higher. For other questions, neither sex, age nor educational background appeared to have any influence on the difference of opinions.

With regard to another question “to what extent the public should be informed of life science research?”, the largest number, 38.3% replied that “it would be sufficient to inform the public of the nature of research and its potential impact on the society”, followed by those who said “the public should be made to understand the impact of research but not necessary the nature of research itself” (15.7%), and those who thought that “the public should be well informed of science (status of research, objectives of researchers) and of its impact on the society” (13.8%). 10.0% replied that average public would have no use of such information. Altogether, it can be said that the public has fairly strong desire to know more about life science.

5. Public Attitudes on Environmental Issues

Until early 1970's environmental issues in Japan were mostly those caused by industrial pollutions, and public interest in these issues was largely confined to specific types of industry or geographical areas. In contrast, today's environmental issues are global in scale, in which all inhabitants on the earth share common interests. As it is, we propose in this section to see what the public attitudes are to those global issues.

(1) Relationship between the Environment and Society

Japan's physical characteristics and weather are highly varied, and for a long time, it was held that nature could take care of itself, including environmental problems. Yet, according to two opinion surveys -- one conducted in December, 1985 and the other in January, 1988 by the Public Relations Division of the Prime Minister's Office, there seems to exist a widening gap between two extreme opinions concerning the environment and society. While there are more people in the latter survey who stated that "we should refrain from interfering with nature and life - - let them pursue their own course" while people who said "we should respect nature, but take advantage of what it can do for us" actually decreased. On the other hand, more people felt in the second survey that "humanbeings should control nature and life on earth" (Fig. 5-1).

(2) Economic Development, Technology Advancement and the Environmental Issue

The opinion survey of January, 1988 concerned, among other things, the impact of economic development on the environment. In this survey, 6.9% voiced an opinion that "economic development has priority over environmental protection", and 51.8% considered that "the advantage and disadvantage of economic development must be analyzed and weighted very carefully". 27.7% were of opinion that "environmental protection is a prerequisite of economic development", and 13.7% responded that they did not know. (Fig. 5-2) Men outnumbered women in all of the opinions expressed -- those who set the priority to economic development, those who held conservative view and those arguing for environmental protection, and the overall trends were fairly constant. However, 18.3% of women replied they "don't know" , indicating that their awareness of environmental issues still lags behind that of men. The ratio of "don't know" answer tended to be higher among the older generation although again their opinions did not show any significant variance from those of other groups.

Next, with regard to the public attitudes concerning progress of technology and its influence on the environmental issues, 28.8% voiced an opinion that “there is fear of new environmental problems which may be caused by technological progress”, while 23.0% thought “there is no need to be concerned as long as the technology is made ‘clean’”, and 21.3% said that “we must tolerate pollution to a certain extent”. A fairly large number of respondents --26.5% --said they didn’t know, like in the case of economic development, women proved to be much less aware of this issue compared to men, as 32.4% of them replied that they didn’t know the answer (Fig. 5-3).

(3) Global Environmental Issues and International Cooperation

Six questions were asked concerning the global issues. To these questions, the people who answered “very concerned” represented 35.6% on the “destruction of forest and oxidization of lakes due to acid rain”, and 32% said they were very concerned about the meteorological disturbances due to CO₂ increases caused by consumption of fossile fuel” (Fig. 5-4). People who voiced concern over “decrease of wild life species” reached 77.1%, including those who indicated “certain concern”.

Next, with regard to a question “what should be the attitude of Japan toward environmental issues ?” , 35.3% voiced opinion that “their country must tackle these issues in a positive manner” , while other 34.7% said “Japan should do what other advanced countries are doing”. While these two opinions represent a certain gap, it can be said that overall, the majority wanted Japan to take a positive attitude to deal with the global issues on the environment (Fig. 5-5) . Figure 5-6 shows what the survey respondents consider as viable ways of cooperation to these issues.

The survey included questions regarding importation and trading of wild animals. To a query “do you know that restrictions exist on importing and trading of certain animals, plants and goods made from such species ?”,73.2% said they were aware of such restrictions, the rest did not know. To another question, “would you still buy such wild animals and plants knowing that it is restricted ?” , 81.9% stated they wouldn’t do so, and 6.6% said “they take care not to buy such things” (Fig. 5-7) .

It is often pointed out that while public awareness of the environmental issues, including protection of wild life and nature, is increasing, these concerns are not yet fully materialized into action. The results of opinion surveys seem to indicate that this has indeed been the case.

6. International Comparison of Public Attitudes on Science and Technology
(Preliminary Study)

Because of the shortage of comparable data, worldwide comparison of public attitudes to science and technology is rather difficult at present. Yet, now that development of science and technology is breaking national boundaries and making nations more inter-dependent, it would be an important task for us to have a better understanding of how public attitudes differs from one country to other. From such a point of view, we have tried to make a preliminary international comparison of public attitudes toward science and technology.

(1) Knowledge and Concern of Science and Technology

Fig. 6-1 shows a comparison of the U.S. and Japanese public in their knowledge of science and technology in conjunction with three technical terms. Because of some differences in the questionnaire formats used, the opinions expressed may not be interpreted in exactly the same context, but we can see that the term “DNA” is less well known in Japan in considering the number of people who said they didn’t know the precise meaning of the term (Fig. 6-1)

In comparing the surveys made in Japan, U.S. and France on the capability of the public to understand scientific knowledge, France led the others in the proportion of people who answered that they can understand, followed by the U.S. and Japan who topped in number of respondents who said they had difficulty understanding science (Fig. 6-2).

One of the questions on the matter of scientific cognition concerned whether people believed in the existence of UFOs, for instance. Again, the question differed in subtle context from one country to the other, but the result shows that in all of the countries surveyed, 30 ~ 40% accepted the existence of UFOs (Fig. 6-3).

Regarding the limitation of medical science in treatment of diseases, there is a similarity in public attitude between Japan and U.S., while French public is divided into two extreme opinion groups (Fig. 6-4).

As to public impression of scientists, the majority in the three countries agreed that “scientists are working hard to contribute to human welfare”, although more than 50% in U.S. and France thought that “scientist’s knowledge could become dangerous” as against 30% in Japan, where the majority of public did not see any danger (Fig. 6-4).

(2) Attitudes towards the Progress of Science and Technology

Our life has changed so much due to development of science and technology. How do people view the impact of progress ?. To a question, “is the progress in science and technology a benefit or detriment to society ?” asked to the public in U.S. and Japan, affirmative answers in U. S. were 14% above those in Japan, but at the same time, those who thought otherwise in America exceeded their Japanese counterparts by 11%. The majority of Japanese were of the opinion that the benefit and loss were balanced against each other; holders of this view in Japan exceeded those in America by 24%. This could be said one of the outstanding characteristics of Japanese views on science and technology (Fig. 6-6).

A comparison of responses in Japan, U.S. and France to a question “is progress of science and technology causing excessive changes in our life ?” shows that the people in France are more inclined to think so. The trend causing excessive changes in our life ?” shows that the people in France are more inclined to think so. The trend is opposite in America, and Japanese public comes halfway between these opposites (Fig. 6-7).

To a question “has the advance of science and technology contributed to improve our standard of living ?” and this in terms of a set of factors, American people showed more positive attitude than Japanese on all of the factors, while in France, where the factors were limited to “conditions of work” and “morality” only, the percentage of negative opinion was higher than those in Japan and in U.S. It is significant that the answers “I don’t know” in terms of the conditions of work were far more numerous in France (Fig. 6-8).

To a question “what will advances in science and technology bring us ?”, many Japanese respondent agreed that “it will make our work more interesting” in a positive manner. Americans who share this view appear to be more reserved by comparison. Only Japanese were asked to reply if scientific and technological advances will bring more comfort to life, about one half of people surveyed said it would, but one third held the opposite view.

People in Japan, America and France were presented with another question “will science and technology succeed in clarifying the mechanism of the human mind?”, to which 85% of Japanese said they did not think so. This ratio was lower both in U.S. (59%) and France (36%) (Fig. 6-9).

From these results, it could be concluded, if tentatively, that people in America feel more positively about the benefit of science and technology, compared to French, who are much more cautious, and to Japanese whose attitude is somewhere between the two.

(3) Attitudes towards the Diffusion of Computers and Robots

Our survey on the number of computers and use of them indicate that U.S. leads Japan in number of computers installed and also in their usage (Fig. 6-10).

Asked how they think about proliferation of computers and robots, people in France are strongly concerned over its impact on employment. Americans also felt so, but not so strongly as French, although in total number of the negative responses, there are more people in U.S. than in France who are worried over the loss of workplace. Generally speaking, people of these three countries appear to be sharing a same degree of concern on this problem. On the other hand, there are large number of people in U.S. and France who hold an optimistic view that it will “increase job opportunities -- topped by U.S. and then France -42%- while this view decrease to 12.5% in Japan and 19% in United Kingdom (Fig. 6-11).

The problem of unemployment resulting from increased use of computers and robots has to be considered, obviously, in the light of prevailing conditions in the labor market. In that context, it is rather surprising that the positive opinion “computers and robots serve to increase job opportunities” prevails in the United States, despite problems of relative high unemployment ratios while the same opinion is less prevalent in Japan, where adjustments have been made rather smoothly.

(4) Attitudes towards Economic Development, Protection of Environment and Natural Resources

The public Relations Division of the Prime Minister’s Office in Japan and E.C. Commission both conducted opinion surveys on the matter of economic development versus protection of environment and natural resources. A comparison of these opinion surveys indicate that the ratio of opinion setting priority to economic development is higher in the smaller European countries such as Ireland, Spain, Greece and others. Those who hold the opposite view, in contrast, that “protection of environment and natural resources should take precedence over economic development” include several E.C. countries such as Luxemburg, France and Italy, and somewhat less so in Japan, Belgium and the Netherlands. On the other hand, the opinion “we should carefully study pros and cons to determine our priorities” is prevalent in Japan, Belgium, West Germany and the Netherlands where the voices in favor of higher priority to environmental protection are relatively fewer (Table 6-1).

To a set of specific questions regarding wild life, natural resources and carbon dioxide, we can see that opinions in the E.C. countries show wide variance from one country to other, and that distribution of opinions on these issues in Japan is fairly consistent with that of the averages for E.C. countries (Table 6-2, 6-3 and 6-4).

Lastly, we have the results of international opinion survey on environment, done jointly by the Yomiuri Newspaper in Japan and Gallup in U.S. during March, 1989. The surveys were taken in Japan, U.S. and in Europe. The results are generally in agreement with those in the preceding surveys in Japan and E.C. countries as they concern the different order of priority to economic development and environmental protection. To a question “to what extent are you paying attention to protection of the environment?”, we see that 70~80% of the respondents in each country replied they care more or less for environmental protection. The answer “I don’t care too much” was relatively numerous in Japan and U.K. , and those who said “I don’t care at all” were noticeably highest in U.K. (Fig. 6-12 and 6-13).

Public attitudes to environmental issues are influenced by the natural or geographical conditions and industry in each country. Thus, it is understandable that distribution of different opinions shows wide variance in the E.C. countries. It will be necessary to see in future the real and specific reasons why such difference exists in each country. This is also true for other issues. One of our future tasks will be to understand the relationship between specific opinions and background of these attitudes.

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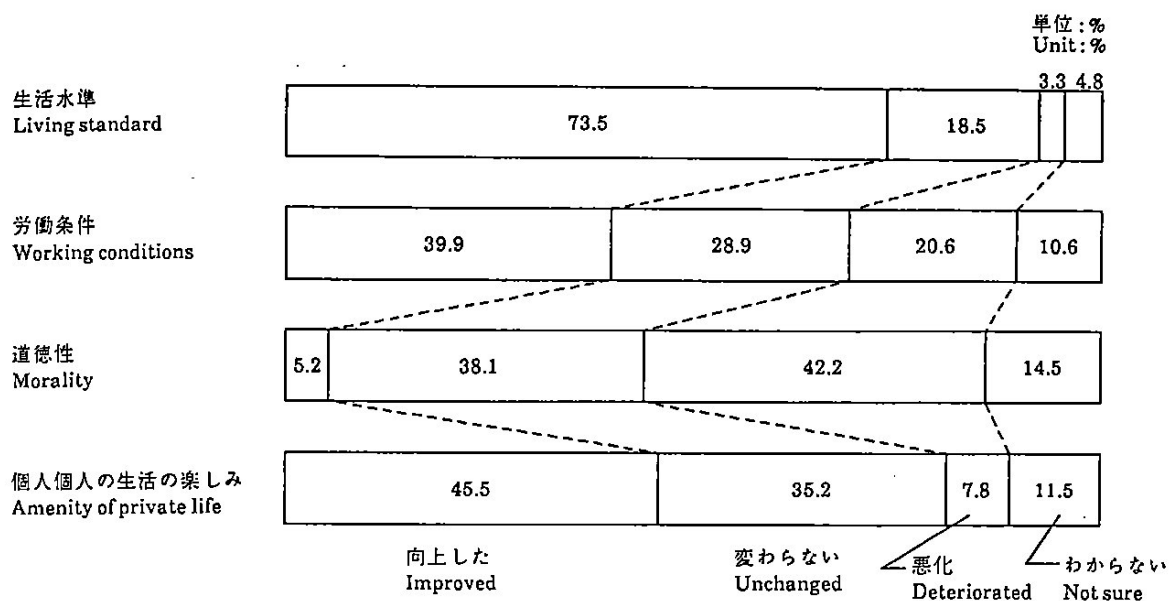
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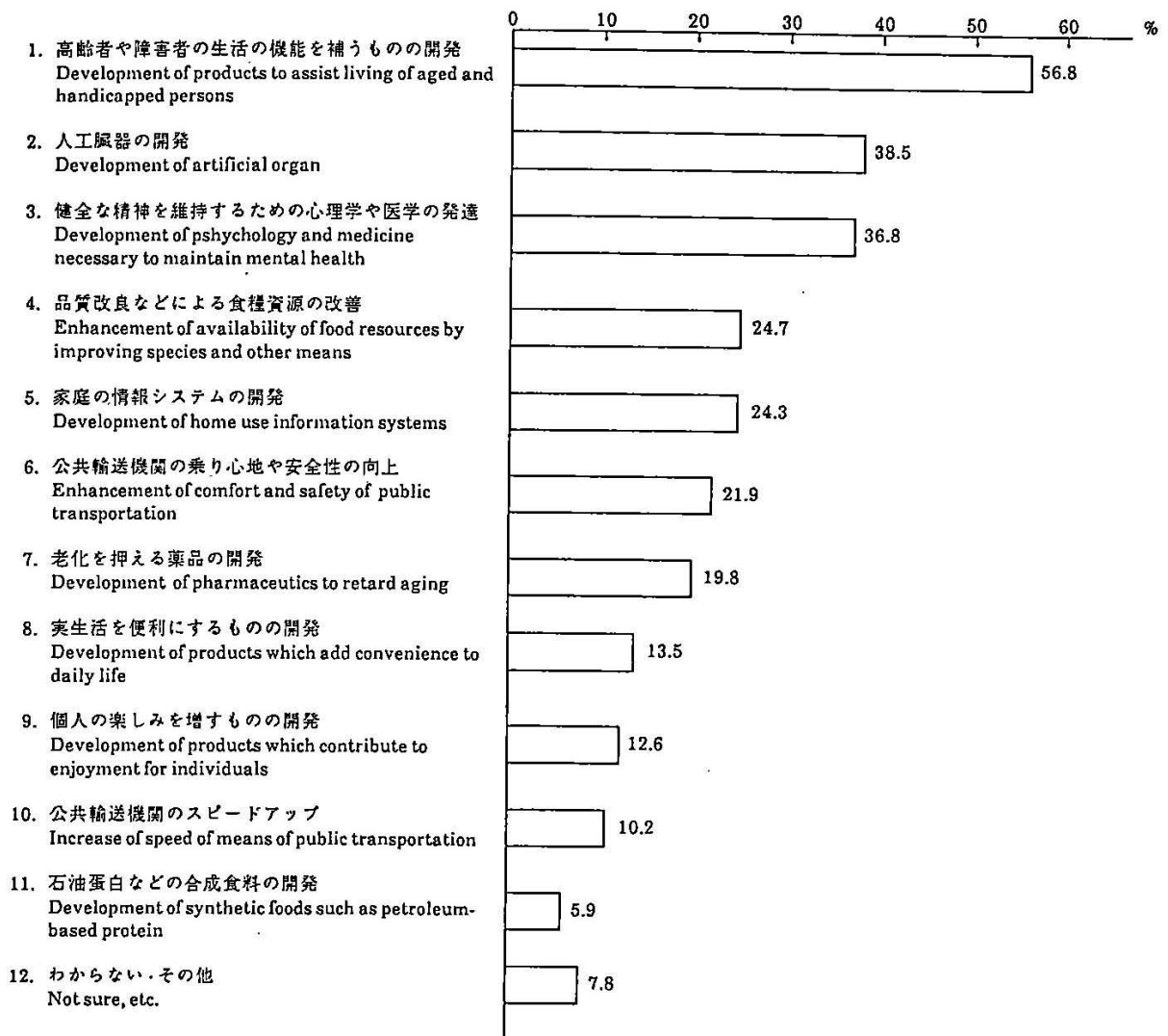
Fig. 1-1 What does the development of Science and Technology brings on daily life ?



(出典) 「科学技術と社会に関する世論調査」(1987年3月調査)

(Source) Opinion Survey on Science, Technology and Society (Mar. 1987)

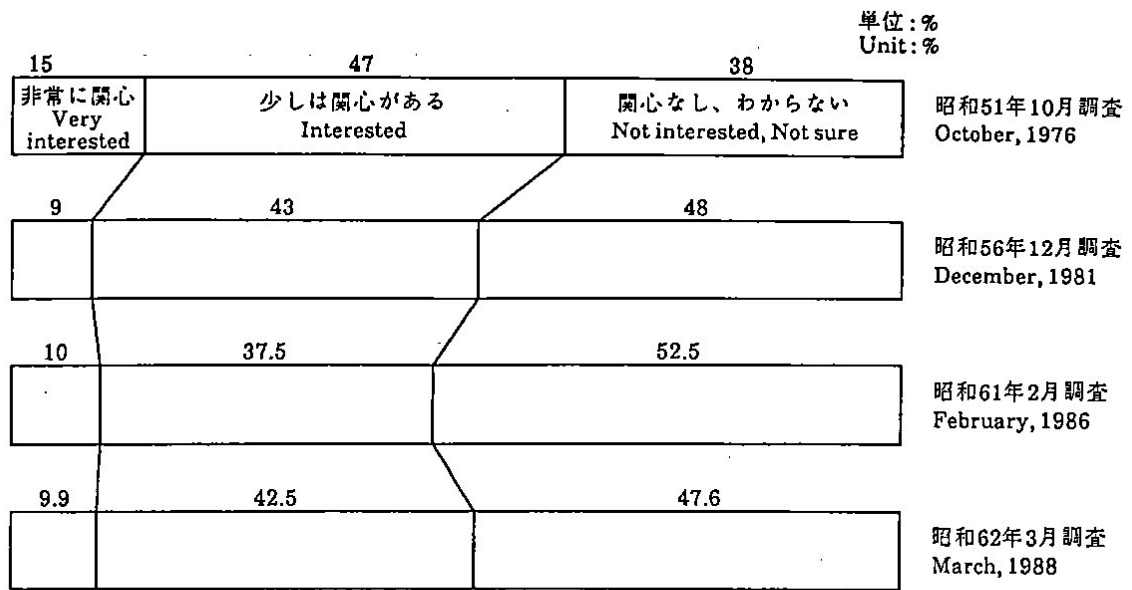
Fig. 1-2 Science and Technology which should be developed (Plural answers solicited)



(出典) 「科学技術と社会に関する世論調査」(1987年3月調査)

(Source) Opinion Survey on Science, Technology and Society (Mar. 1987)

Fig. 1-3 Changing of interest in Science and Technology



- (出典) 「科学技術及び原子力に関する世論調査」(1976年10月調査)
「科学技術に関する世論調査」(1981年12月調査)
「科学技術に対する関心に関する世論調査」(1986年2月調査)
「科学技術と社会に関する世論調査」(1987年3月調査)

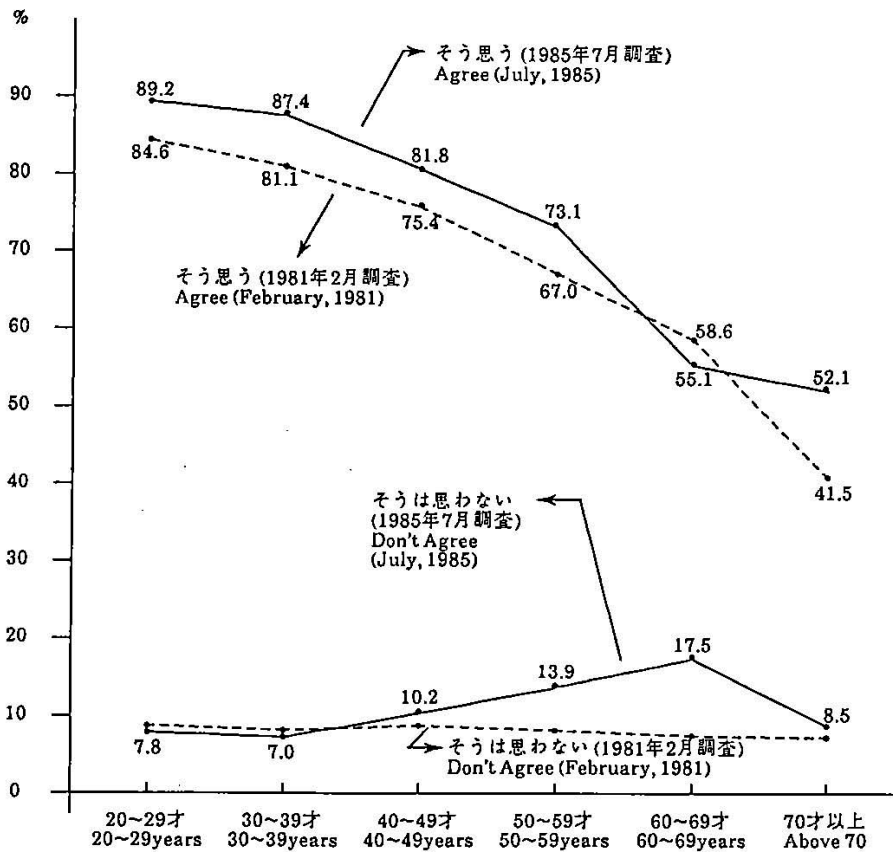
(Source) Opinion Survey on Science, Technology and Nuclear power (Oct. 1976)
Opinion Survey on Science and Technology (Dec. 1981)
Opinion Survey on Understanding of Science and Technology (Feb. 1986)
Opinion Survey on Science, Technology and Society (Mar. 1987)

Fig. 2-1 Do you think that current society is an "Information (Joho-ka) Society?"

(1) 平均 Average

1981年2月調査 February, 1981	そう思う Agree 73.7%		8.0%	わからない Not sure 18.3%
	そう思う Strongly agree 39.2%	まあそう思う Rather agree 34.5%		
↳ そうは思わない Do not agree				
1985年7月調査 July, 1985	そう思う Agree 76.7%		10.8%	わからない Not sure 12.5%
	そう思う Strongly agree 42.0%	まあそう思う Rather agree 34.7%		
↳ そうは思わない Do not agree				

(2) 年齢階層別 Age distribution



(備考) 「情報化社会」という言葉を見聞きしたことのある者に対する質問への回答比率である。

(Note) This shows distribution of answers by age groups of persons who said they knew the term "information (Joho-ka) society".

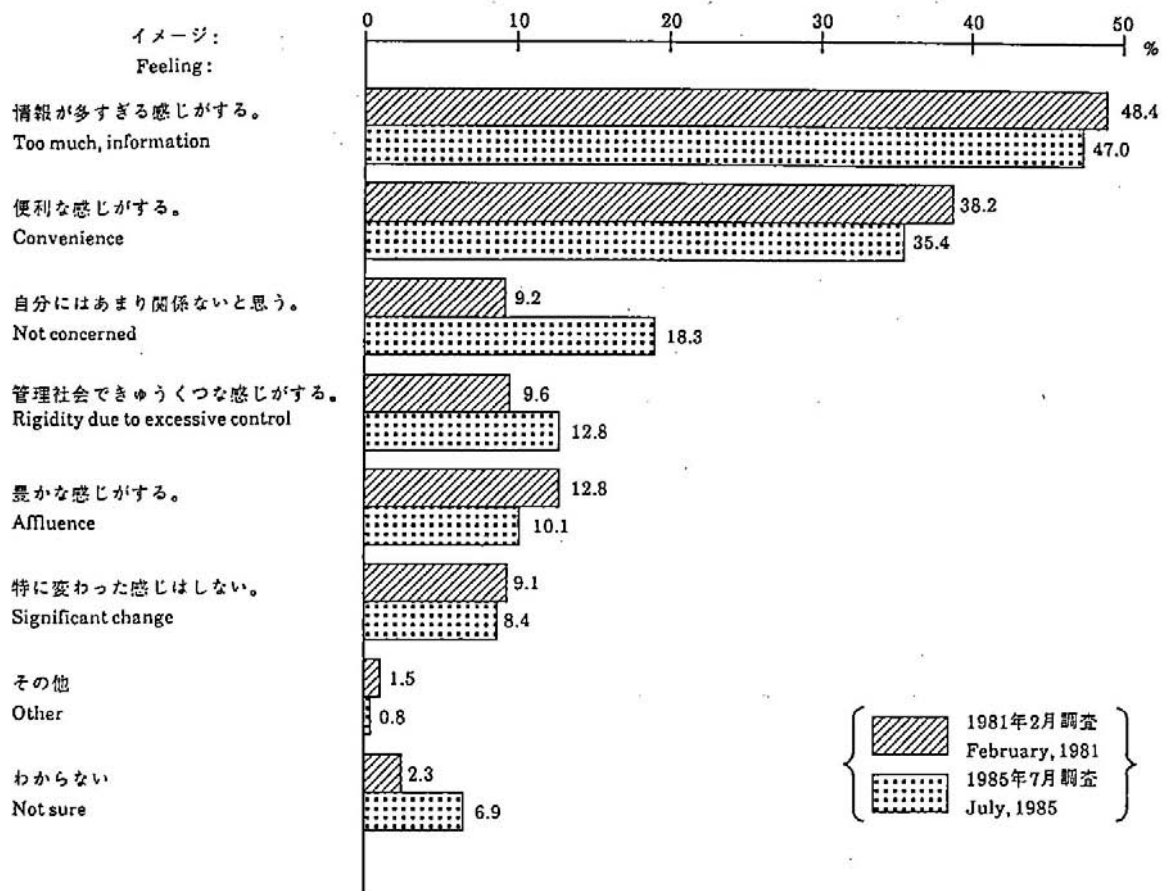
(出典) 「プライバシー保護に関する世論調査」(1981年2月調査)

「個人情報の保護に関する世論調査」(1985年7月調査)

(Source) Opinion Survey on Privacy protection (Feb. 1981)

Opinion Survey on protection of personal information (Jul. 1985)

Fig. 2-2 Impressions of "Information (Joho-ka) Society" (Plural answers solicited)



(備考) 「現代は情報化社会と思うか」という質問に「分からない」と答えた人を除いている。

(Note) Responses to a question "do you agree that we live in information (Joho-ka) society", excluding those who said they didn't know.

(出典) 「プライバシー保護に関する世論調査」(1981年2月調査)

「個人情報の保護に関する世論調査」(1985年7月調査)

(Source) Opinion Survey on Privacy Protection (Feb. 1981)

Opinion Survey on Protection of personal Information (Jul. 1985)

Table. 2-1 Expectation for “Information (Joho-ka) Society” (Age group)

Unit: %

	Total	<Men>	20~29	30~39	40~49	50~59	Above 60	<Women>	20~29	30~39	40~49	50~59	Above 60
number of respondents	1,052	509	146	107	102	85	69	543	124	141	111	101	66
Increased availability of exact information	43.3	47.5	43.8	55.1	52.9	49.4	33.3	39.4	45.2	44.7	40.5	28.7	31.8
Promptness of a vailability of information	44.3	49.9	58.9	58.9	51.0	35.3	33.3	39.0	53.2	46.8	36.9	27.7	19.7
Overall cost reduction	19.3	24.4	19.2	29.9	25.5	20.0	30.4	14.5	15.3	14.2	19.8	11.9	9.1
Increase of leisure time	14.7	15.5	23.3	14.0	12.7	10.6	11.6	14.0	21.0	16.3	13.5	11.9	-
Increases cultural opportunities	26.6	28.9	24.0	34.6	31.4	31.8	23.2	24.5	29.0	26.2	24.3	21.8	16.7
Better public services to the handicapped	35.8	30.8	30.1	35.5	27.5	29.4	31.9	40.5	38.7	44.7	45.0	33.7	37.9
More opinions are reflected on public administration	15.7	17.5	14.4	15.0	14.7	24.7	23.2	14.0	12.1	17.7	10.8	16.8	10.6
Encourages social participation of the aged and handicapped	23.5	19.6	15.8	13.1	22.5	21.2	31.9	27.1	24.2	28.4	18.9	27.7	42.4
Encourages social participation of women	17.0	13.4	6.8	17.8	16.7	11.8	17.4	20.4	23.4	18.4	23.4	20.8	13.6
Nothing in particular	11.5	9.2	10.3	3.7	8.8	11.8	13.0	13.6	4.8	5.0	14.4	23.8	31.8

(Source) Opinion Survey on “Joho-Society” and Daily Life
 (Liason Office of Joho (Information), the Tokyo Metropolitan Government,1985)

Table. 2-2 Anxiety for “Information (Joho-ka) Society” (Age group)

Unit: %

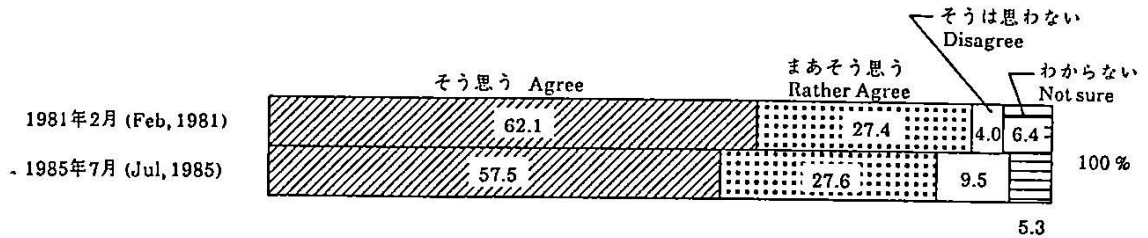
	Total	<Men>	20~29	30~39	40~49	50~59	Above 60	<Women>	20~29	30~39	40~49	50~59	Above 60
number of respondents	1,052	509	146	107	102	85	69	543	124	141	111	101	66
Computing errors	56.7	59.1	58.2	58.9	60.8	63.5	53.6	54.3	49.2	63.8	56.8	52.5	42.4
Difficulty to search needed data	28.7	27.7	30.8	31.8	23.5	27.1	21.7	29.7	43.5	26.2	27.0	27.7	18.2
Infringement on private data	32.6	36.0	34.2	44.9	41.2	31.8	23.2	29.5	28.2	34.8	30.6	26.7	22.7
Computer crime	37.2	36.5	37.7	32.7	33.3	37.6	43.5	37.8	42.7	38.3	44.1	31.7	25.8
Confusion due to computer failure	19.0	24.0	28.8	27.1	28.4	16.5	11.6	14.4	15.3	17.0	15.3	9.9	12.1
Loss of humane feeling	39.6	39.9	40.4	43.0	38.2	38.8	37.7	39.4	42.7	48.9	32.4	35.6	30.3
Excessive speed of social change	9.9	8.8	4.8	9.3	9.8	7.1	17.4	10.9	10.5	11.3	9.0	12.9	10.6
Financial burden	9.5	8.1	6.8	9.3	8.8	10.6	4.3	10.9	10.5	9.9	9.9	12.9	12.1
Make life harder to the aged person	9.3	7.9	3.4	6.5	5.9	8.2	21.7	10.7	8.9	9.9	10.8	10.9	15.2
Worsens labor problems	16.8	15.9	14.4	23.4	13.7	14.1	13.0	17.7	18.5	17.7	118.9	18.8	12.1
Nothing in particular	7.9	6.3	6.8	1.9	5.9	7.1	11.6	9.4	4.0	3.5	6.3	15.8	27.3

(Source) Opinion Survey on “Joho-Society” and Daily Life
(Liason Office of Joho (Information), the Tokyo Metropolitan Government, 1985)

Fig. 2-3 What do you think about the computers ?

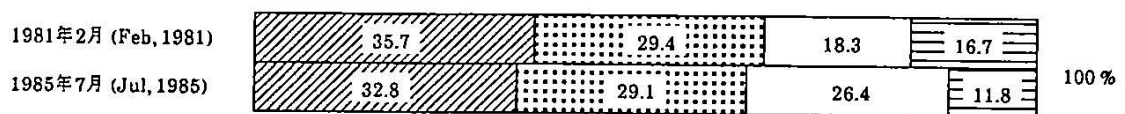
① コンピュータのおかげで世の中はずい分便利になった。

Computers have greatly contributed to convenience in our life.



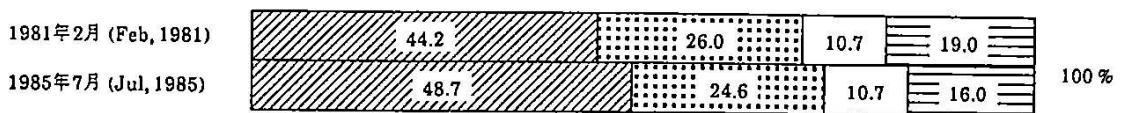
② コンピュータは必ずしも個人の利益に役立つとは限らない。

Computers do not necessarily serve the interests of individuals.



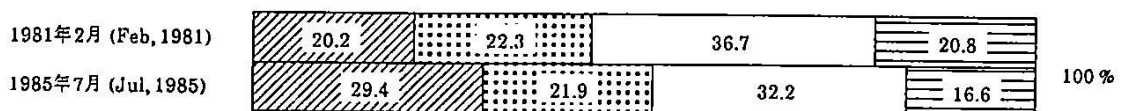
③ コンピュータによって利害関係が生ずるのは、それを使う人次第だ。

Whether computers create or not conflict of interests depends on who are using them.



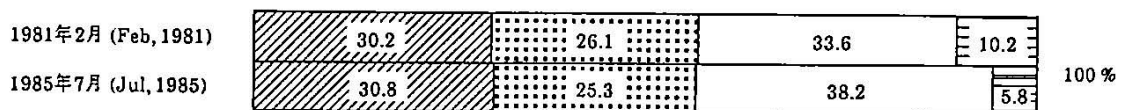
④ コンピュータの普及によって個人の私生活が侵される危険が増えた。

Proliferation of computers has increased the risks of infringement of privacy.



⑤ コンピュータといっても、なんとなくなじめない。

We so often hear about computers, but they don't look friendly to us.



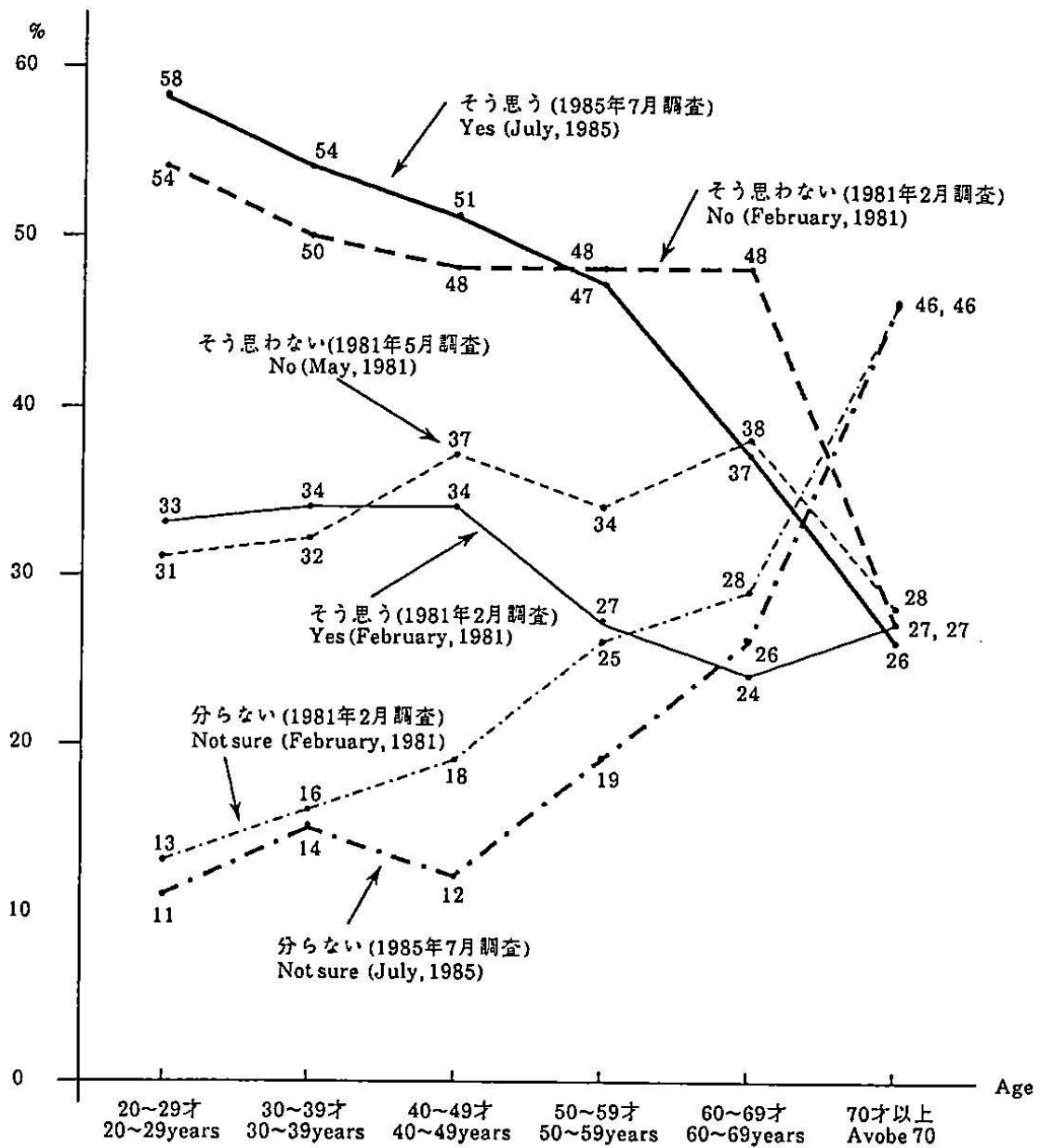
(出典) 「プライバシー保護に関する世論調査」(1981年2月調査)

「個人情報の保護に関する世論調査」(1985年7月調査)

(Source) Opinion Survey on Privacy Protection (Feb. 1981)

Opinion Survey on Protection of Personal Information (Jul. 1985)

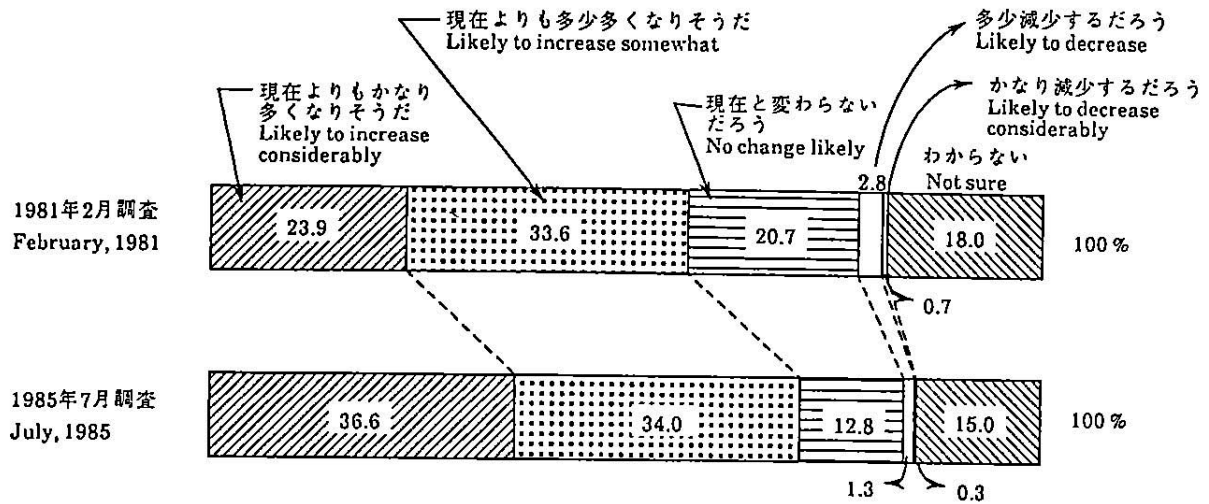
Fig. 2-4 Do you think cases of privacy infringement have increased? (Age group)



(出典) 「プライバシー保護に関する世論調査」(1981年2月調査)
 「個人情報の保護に関する世論調査」(1985年7月調査)

(Source) Opinion Survey on Privacy Protection (Feb. 1981)
 Opinion Survey on Protection of Personal Information (Jul. 1985)

Fig. 2-5 Future prospect of occurrence of privacy infringement



(出典) 「プライバシー保護に関する世論調査」(1981年2月調査)
 「個人情報の保護に関する世論調査」(1985年7月調査)

(Source) Opinion Survey on Privacy Protection (Feb. 1981)
 Opinion Survey on Protection of Personal Information (Jul. 1985)

Table. 3-1 Trends in responses to the question “What will be the main source of electricity supply in future ?”

		(%)							
Survey Date	Types	(1975/10)	(1976/10)	(1978/2)	(1980/2)	(1980/11)	(1981/11)	(1984/3)	(1987/8)
	Nuclear energy	48.4	49.1	38.1	32.5	46.6	49.8	50.9	60.6
	Solar light/heat	8.4	16.9	26.3	27.7	18.2	10.8	18.3	10.7
	Hydroelectric	4.9	5.5	5.2	7.1	6.0	4.6	6.4	4.0
	Thermal electric	7.9	4.4	4.5	12.1	12.5	14.5	9.9	9.3
	Gesthermal	1.1	1.8	1.9	1.4	0.9	0.2	0.8	0.5
	Other	0.1	0.1	0.3	0.2	0.2	0.1	0.1	0.1
	Don't know	29.1	22.2	23.8	18.9	15.6	20.0	13.5	14.8

(Source) Opinion Survey on Nuclear Power Plants (Oct. 1975)
 Opinion Survey on Science, Technology and Nuclear Power (Oct. 1976)
 Opinion Survey on Energy and Resource Use (Feb. 1978) (Feb. 1980)
 Opinion Survey on Energy Use (Nov. 1980). (Nov. 1981)
 Opinion Survey on Nuclear Power (Mar. 1984). (Aug. 1987)

Table. 3-2 Trends in responses to the question “What do you think about the forecast that consumption of energy will increase in Japan inspite of saving efforts ?”

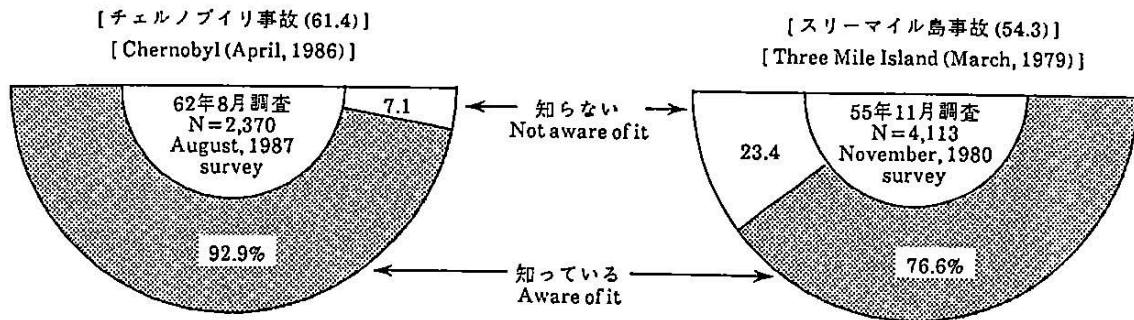
(%)

Survey Date	(1978/2)	(1980/2)	(1980/11)	(1981/11)
Answers				
We should not increase our energy consumption even if it means some sacrifice in our standard of living.	8.8	13.3	13.5	8.3
We must accept an increase in energy consumption necessary to improve our standard of living, although we should try to check the consumption as much as possible.	—*	—*	—*	39.5
We should save energy, and at the same time, it is necessary to develop new energy sources to make up for shortage.	54.2	55.8	54.9	32.5
We should develop new sources of energy whenever necessary.	19.2	16.1	18.1	8.0
Others	0.3	0.5	0.6	0.1
Don't know	17.4	14.2	12.9	11.6

(Note) The answer * was not included in the respondents' choice.

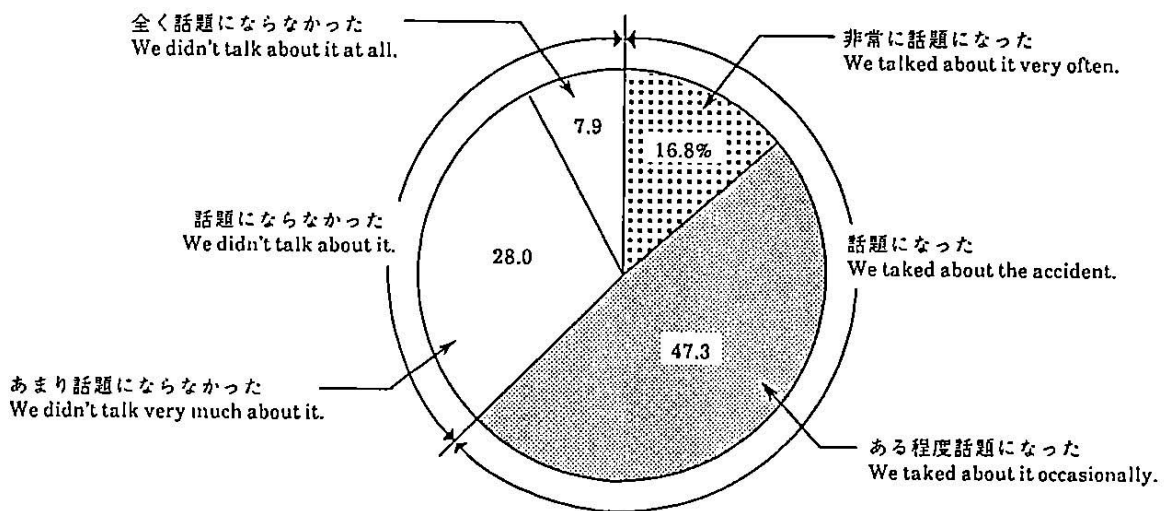
(Source) Opinion Survey on Energy and Resource Use (Feb. 1978). (Feb. 1980)
Opinion Survey on Energy Use (Nov. 1980). (Nov. 1981)

Fig. 3-1 The level of knowledge of accidents in nuclear plant



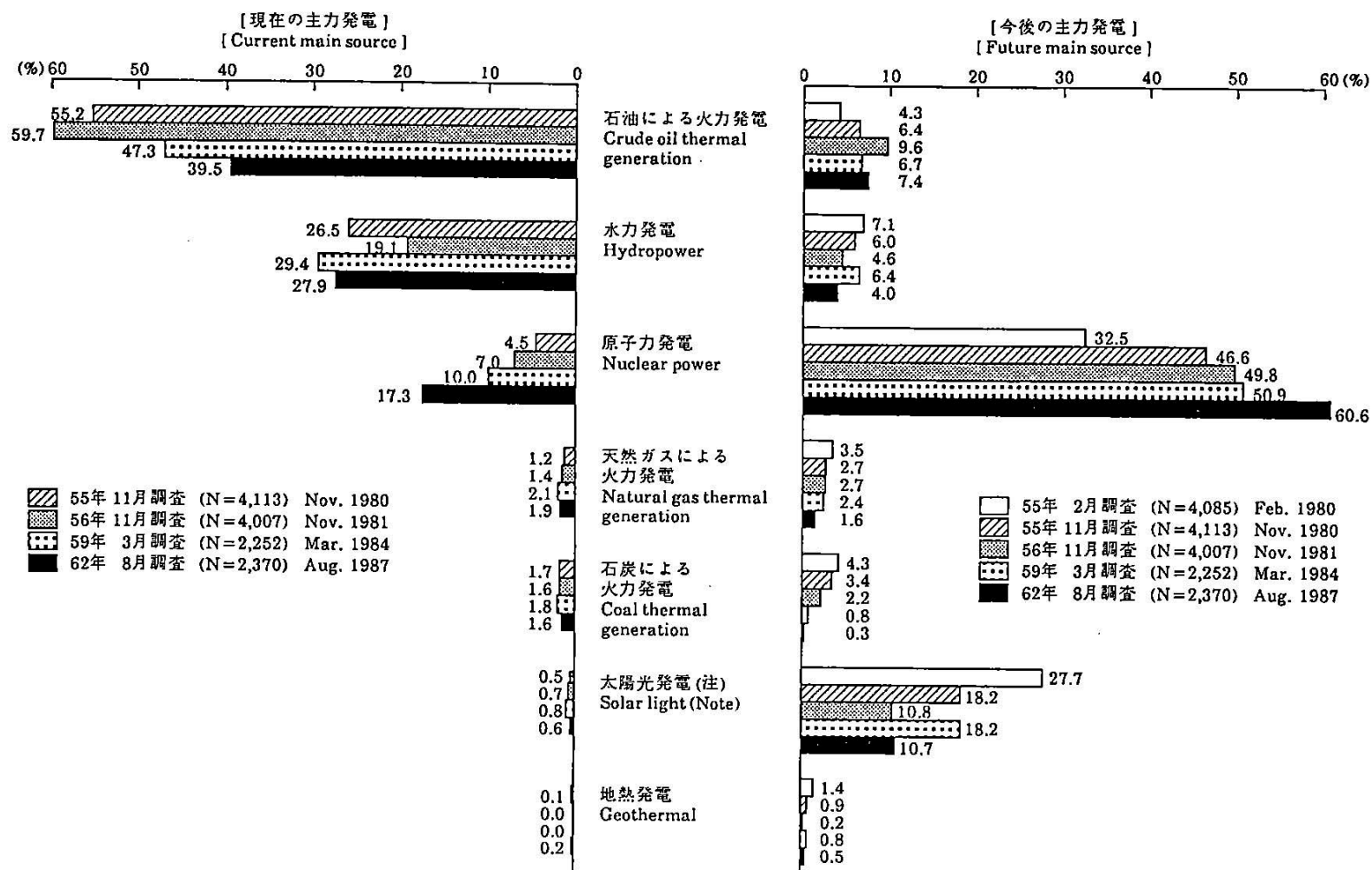
(出典) 「原子力に関する世論調査」(1987年8月調査)
 (Source) Opinion Survey on Nuclear Power (Aug. 1987)

Fig. 3-2 How often did the accidents become a topic ?
 (question put to 2,201 who replied they knew about the accidents)



(出典) 「原子力に関する世論調査」(1987年8月調査)
 (Source) Opinion Survey on Nuclear Power (Aug. 1987)

Fig. 3-3 What do you think will be the main source of electric power in future ?



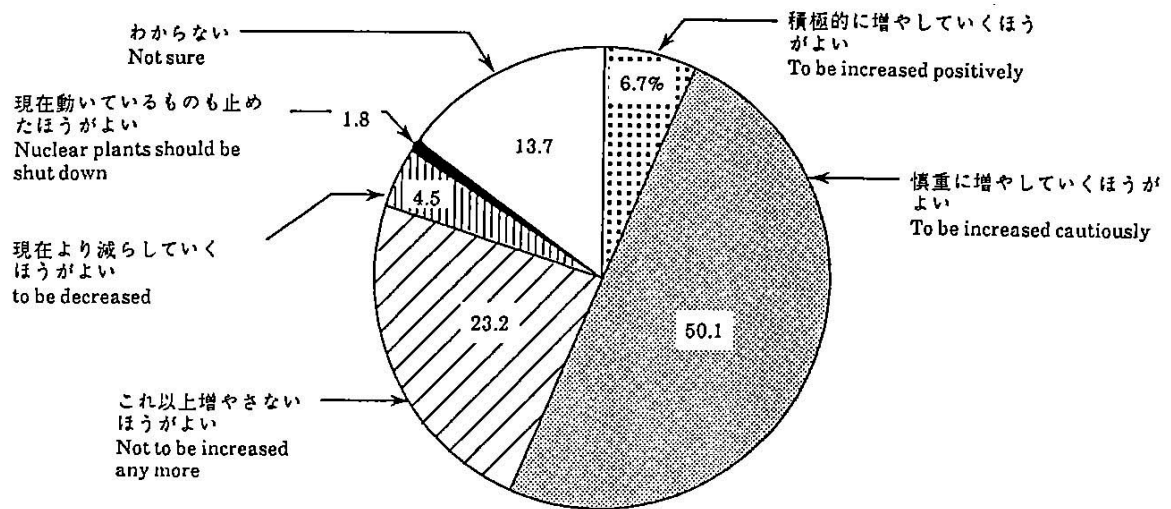
(注) 昭和55年2月、55年11月及び56年11月調査では「太陽熱発電」となっている。

(Note) This category was given as "solar heat" generation in the surveys done in February and November, 1980 and in November, 1981.

(出典) 「原子力に関する世論調査」(1987年8月調査)

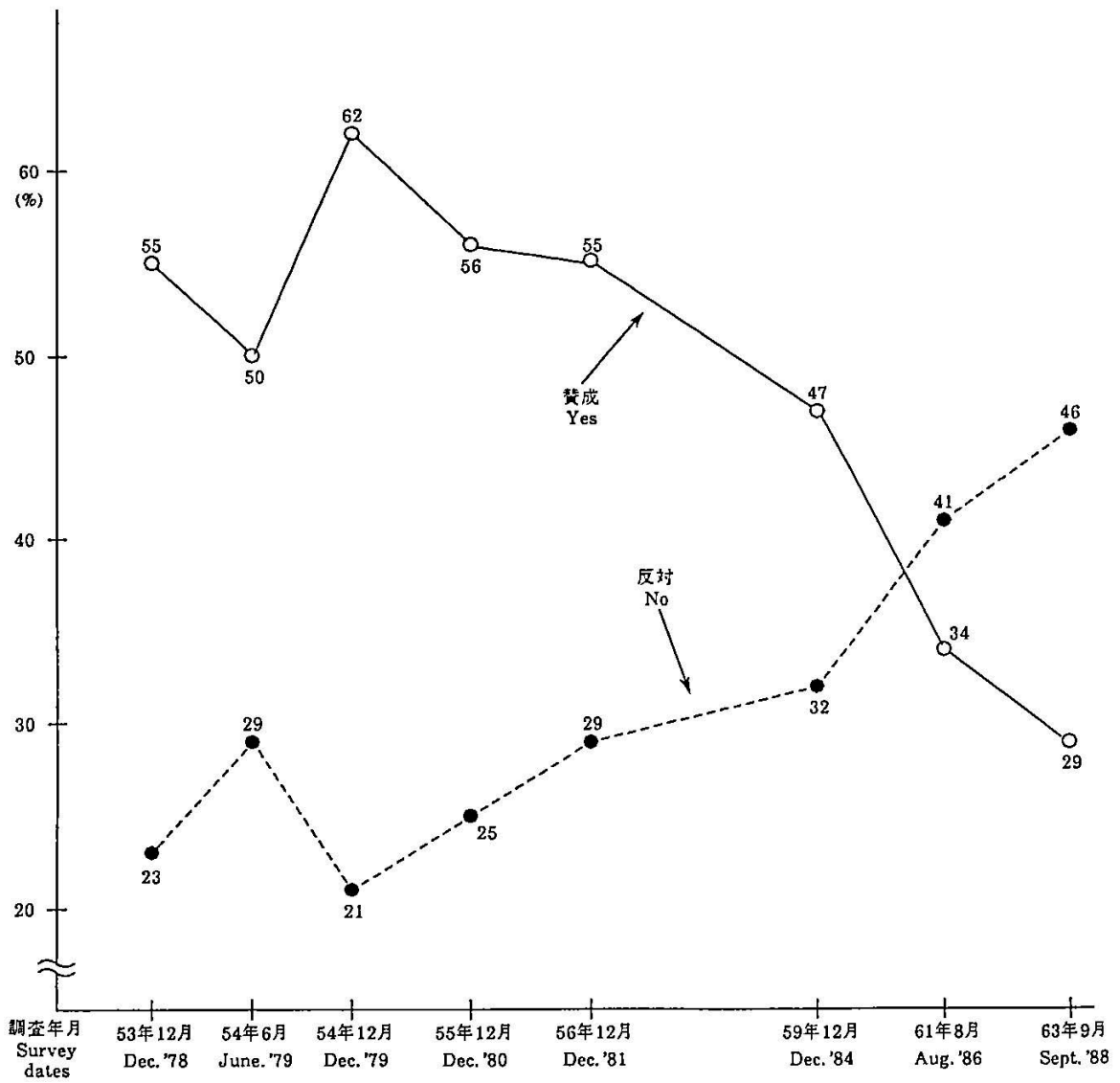
(Source) Opinion Survey on Nuclear Power (Aug. 1987)

Fig. 3-4 Share of nuclear-powered electricity in future



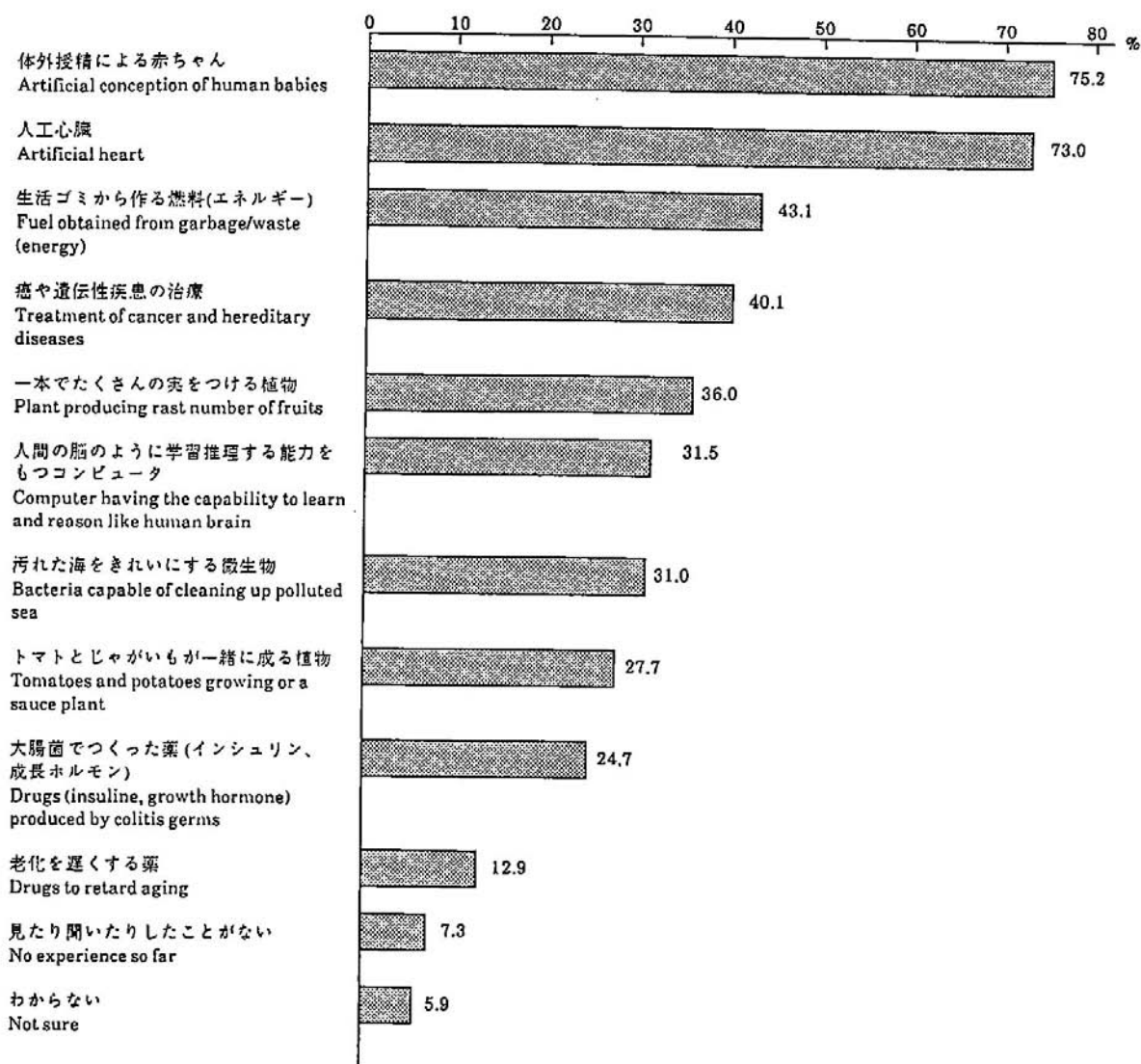
(出典) 「原子力に関する世論調査」(1987年8月調査)
 (Source) Opinion Survey on Nuclear Power (Aug. 1987)

Fig. 3-5 Should nuclear power generation be promoted in future ?



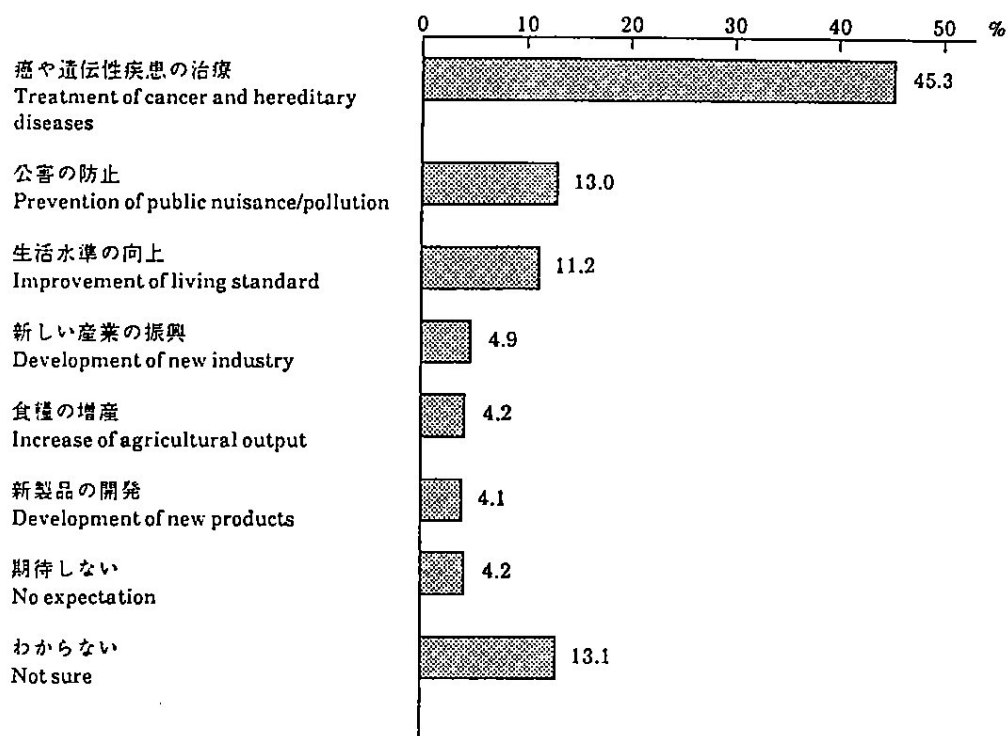
(出典) 朝日新聞 1988年9月27日 朝刊
 (Source) Asahi Newspaper morning edition (1988. 9. 27)

Fig. 4-1 Perception on current achievements in life sciences (Plural answers solicited)



(出典) 「ライフサイエンス(生命科学)に関する世論調査」(1985年12月調査)
(Source) Opinion Survey on Life Science (Dec. 1985)

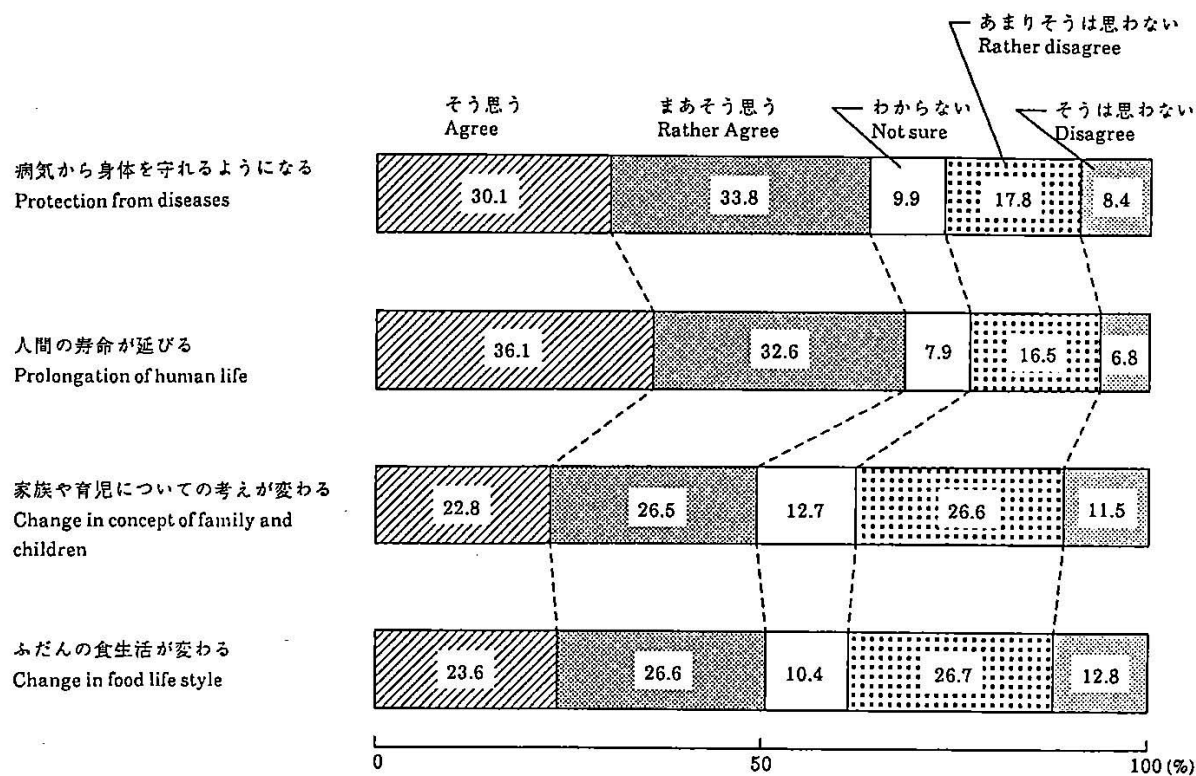
Fig. 4-2 Expectation to life sciences (Plural answers solicited)



(出典) 「ライフサイエンス(生命科学)に関する世論調査」(1985年12月調査)

(Source) Opinion Survey on Life Science (Dec. 1985)

Fig. 4-3 Development of life sciences and impacts on life



(出典) 「ライフサイエンス(生命科学)に関する世論調査」(1985年12月調査)

(Source) Opinion Survey on Life Science (Dec. 1985)

Fig. 4-4 Interest in application of life sciences to medicine

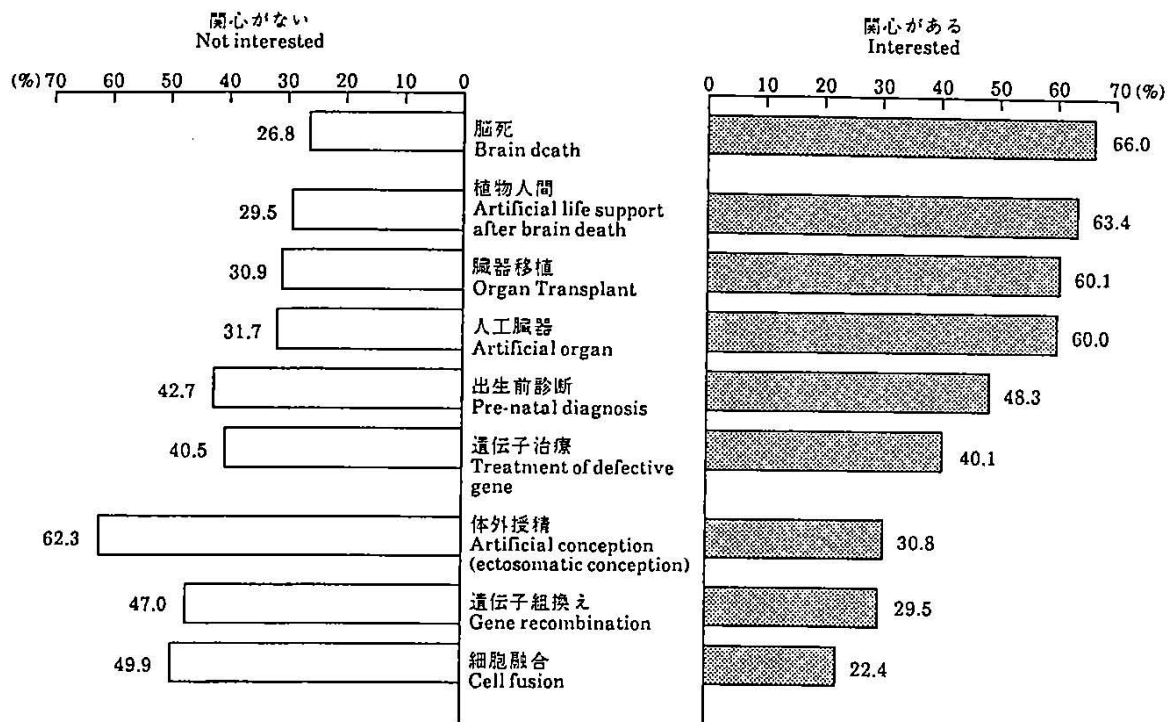
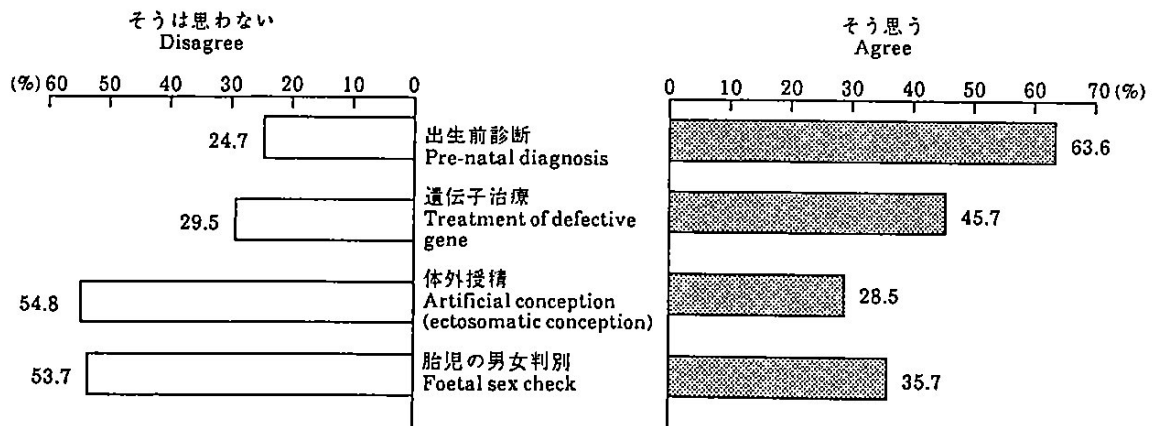


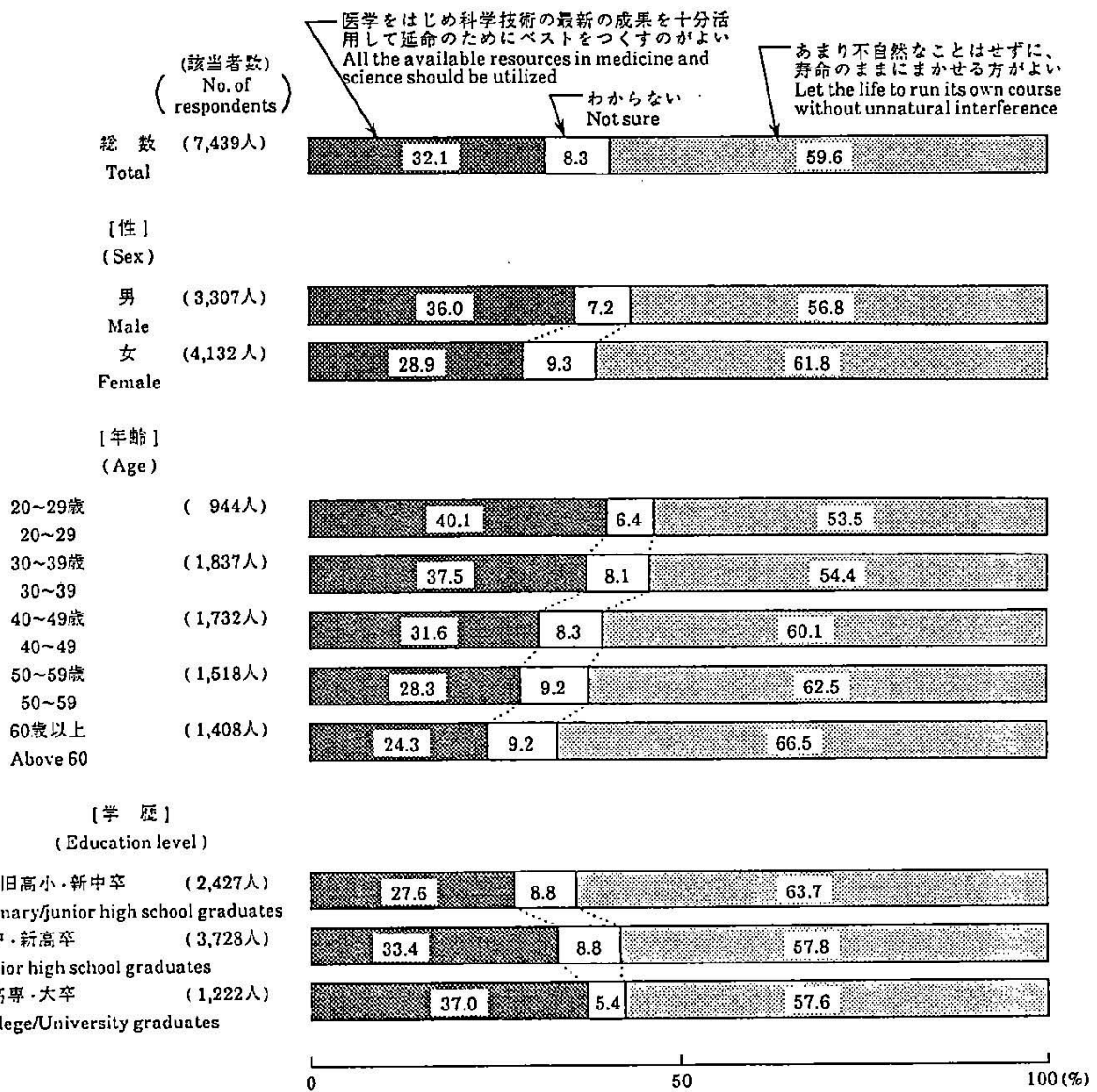
Fig. 4-5 What do you think application of life science result to the human body ?



(出典) 「ライフサイエンス(生命科学)に関する世論調査」(1985年12月調査)

(Source) Opinion Survey on Life Science (Dec. 1985)

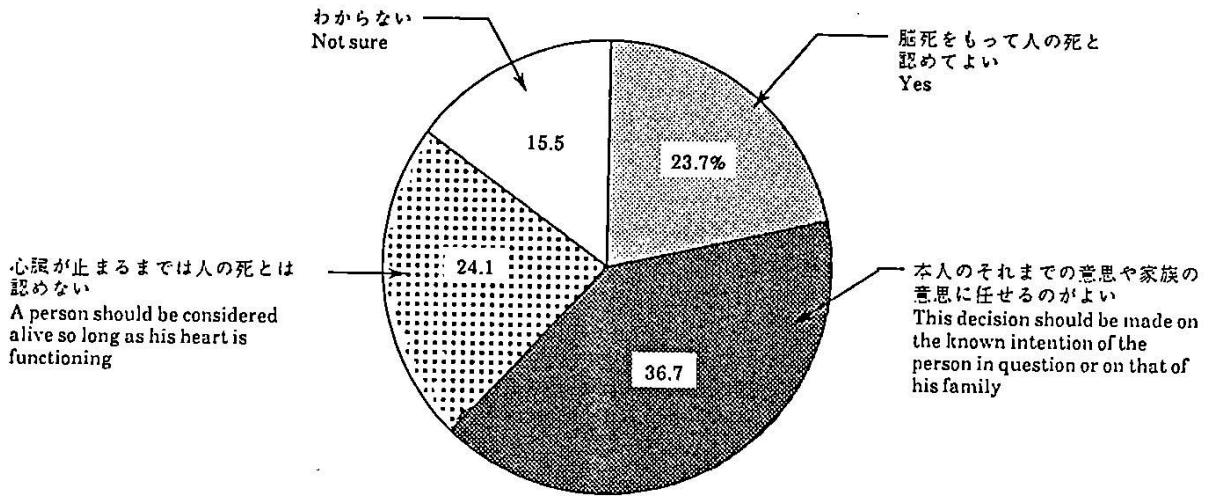
Fig. 4-6 Do you agree to receive medical care for prolonging your life ?



(出 典) 「ライフサイエンス(生命科学)に関する世論調査」(1985年12月調査)

(Source) Opinion Survey on Life Science (Dec. 1985)

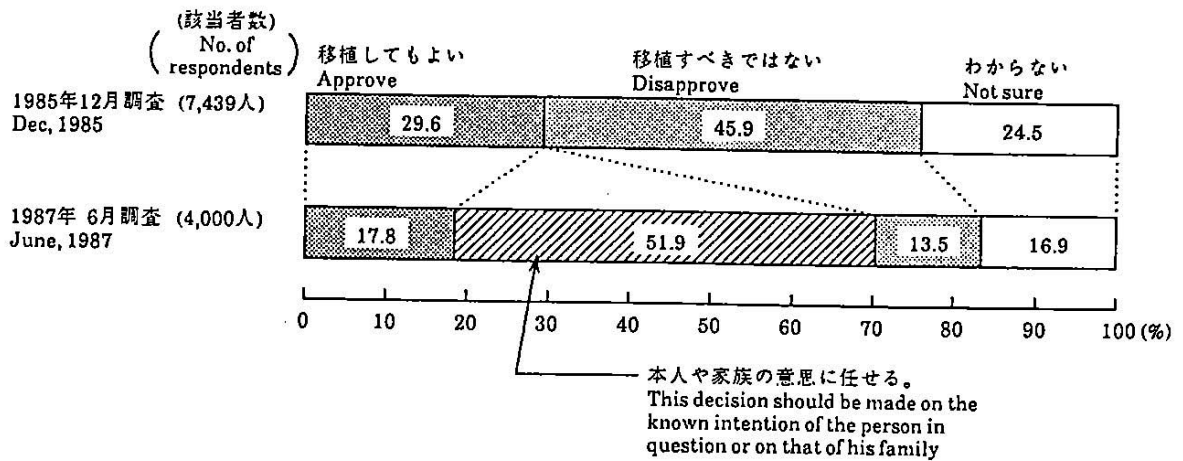
Fig. 4-7 Should the "Brain Death" be considered as the "Death" ?



(出典) 「保険医療サービスに関する世論調査」(1987年6月調査)

(Source) Opinion Survey on Health and Medical Services, (Jun. 1987)

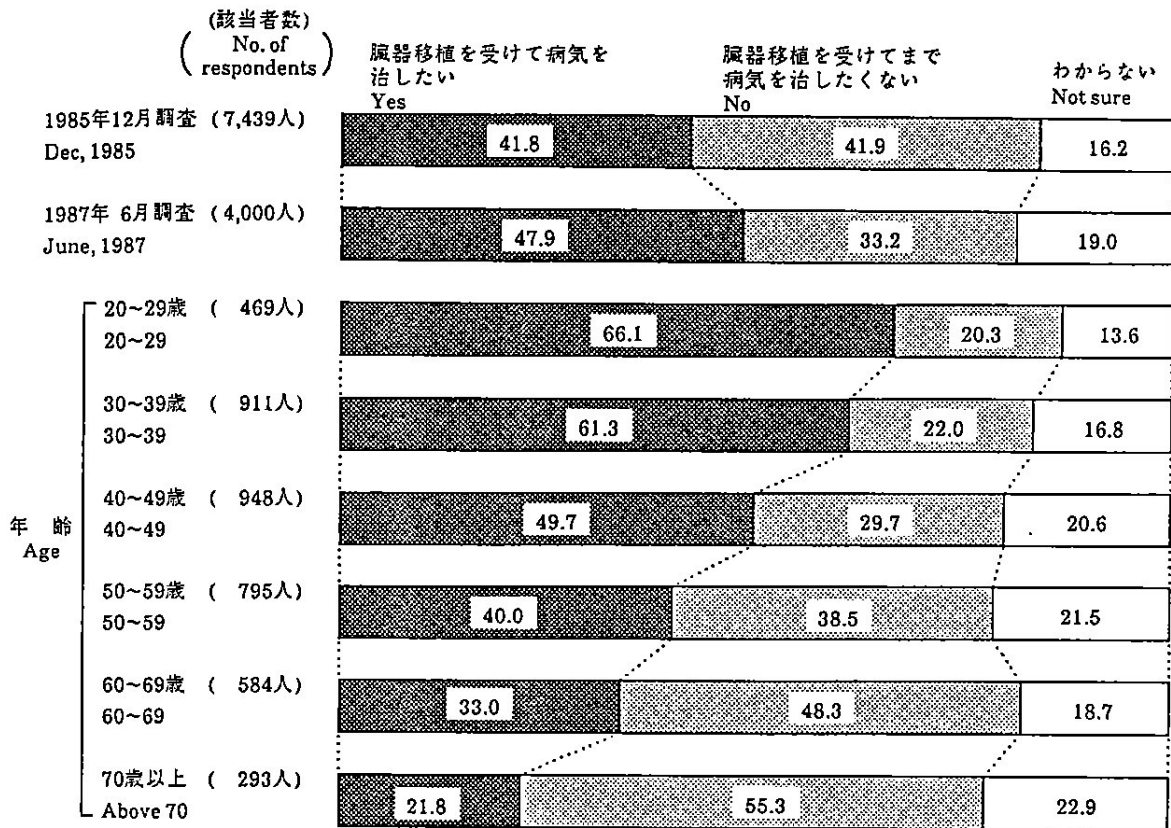
Fig. 4-8 Do you approve organ transplant from a person in the state of "brain death" ?



(出典) 「保険医療サービスに関する世論調査」(1987年6月調査)

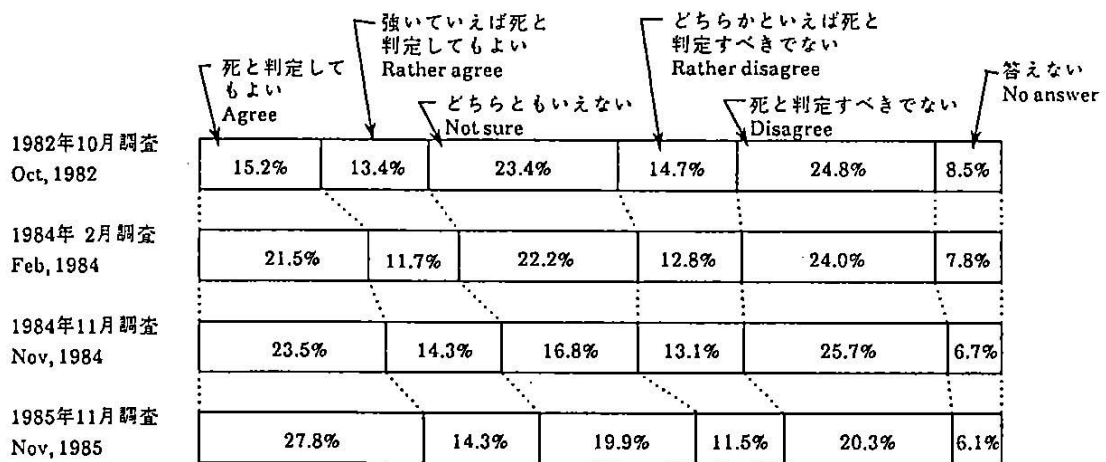
(Source) Opinion Survey on Health and Medical Services (Jun. 1987)

Fig. 4-9 Do you accept organ transplant if it is necessary ?



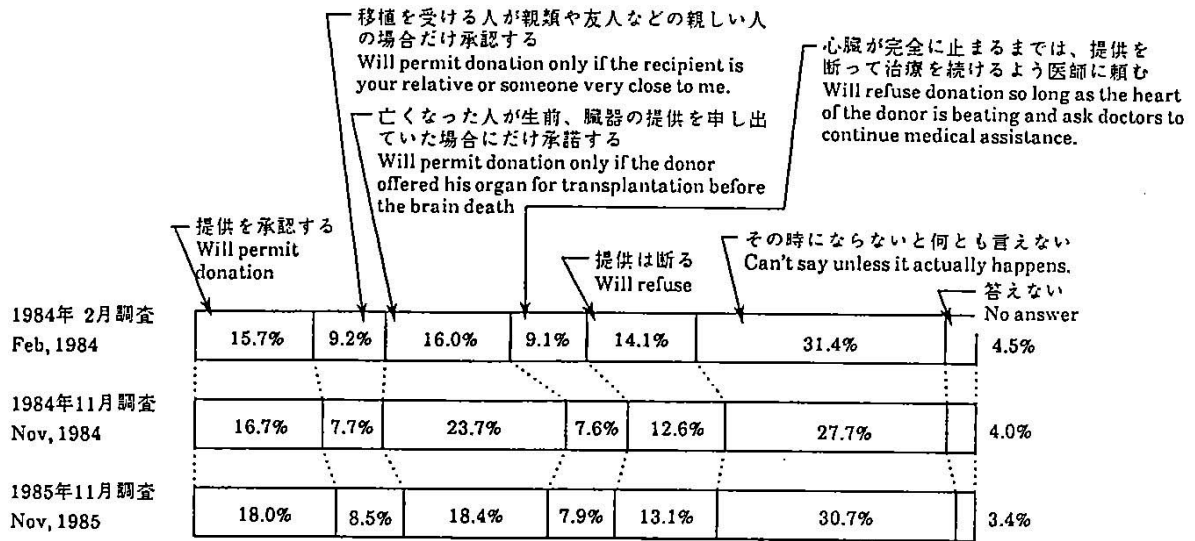
(出 典) 「保険医療サービスに関する世論調査」(1987年6月調査)
(Source) Opinion Survey on Health and Medical services (Jun. 1987)

Fig. 4-10 Trends in responses of the question “Do you agree to take ‘brain death’ as the ‘death’?”



(出 典) 読売全国世論調査 (1982年10月, 1984年2月, 1984年11月, 1985年11月調査)
(Source) The Yomiuri Newspaper National Opinion Surveys (Oct. '82, Feb. '84, Nov. '84, Nov. '85)

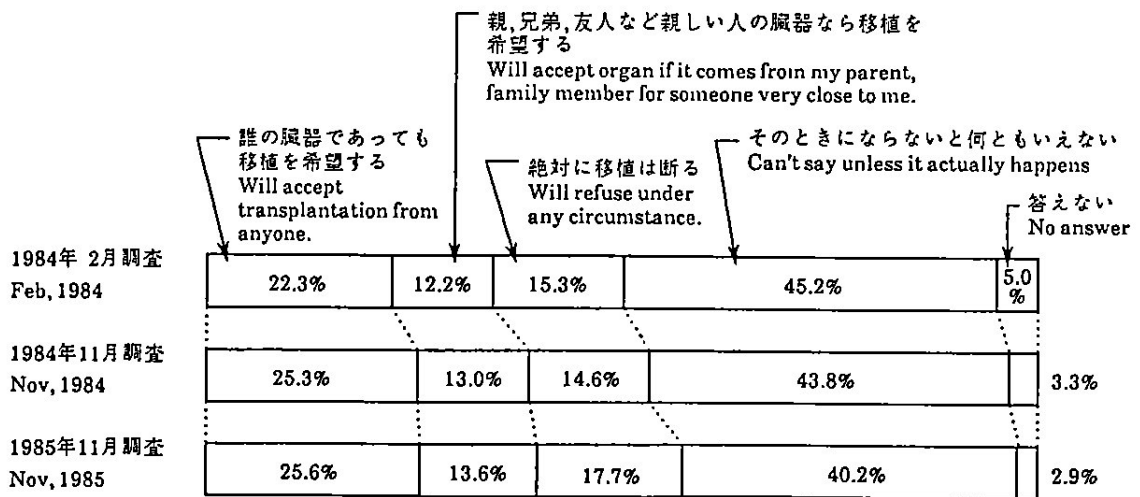
Fig. 4-11 Would you permit donation of organ from your relatives if they were in the state of "brain death" ?



(出典) 読売全国世論調査 (1984年2月, 1984年11月, 1985年11月調査)

(Source) The Yomiuri Newspaper National Opinion Surveys (Feb. '84, Nov. '84, Nov. '85)

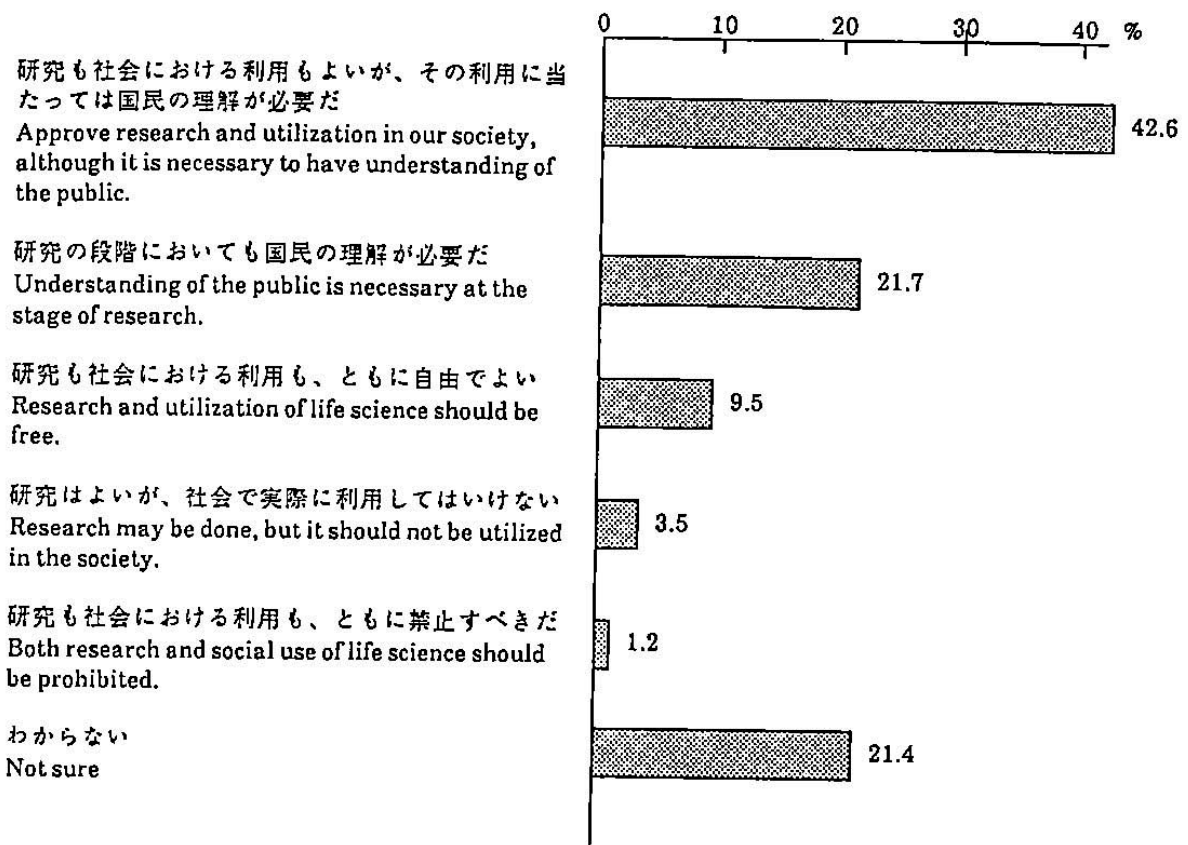
Fig. 4-12 Do you want to receive organ transplants in case you are ill ?



(出典) 読売全国世論調査 (1984年2月, 1984年11月, 1985年11月調査)

(Source) The Yomiuri Newspaper's National Opinion Surveys (Feb. '84, Nov. '84 and Nov. '85)

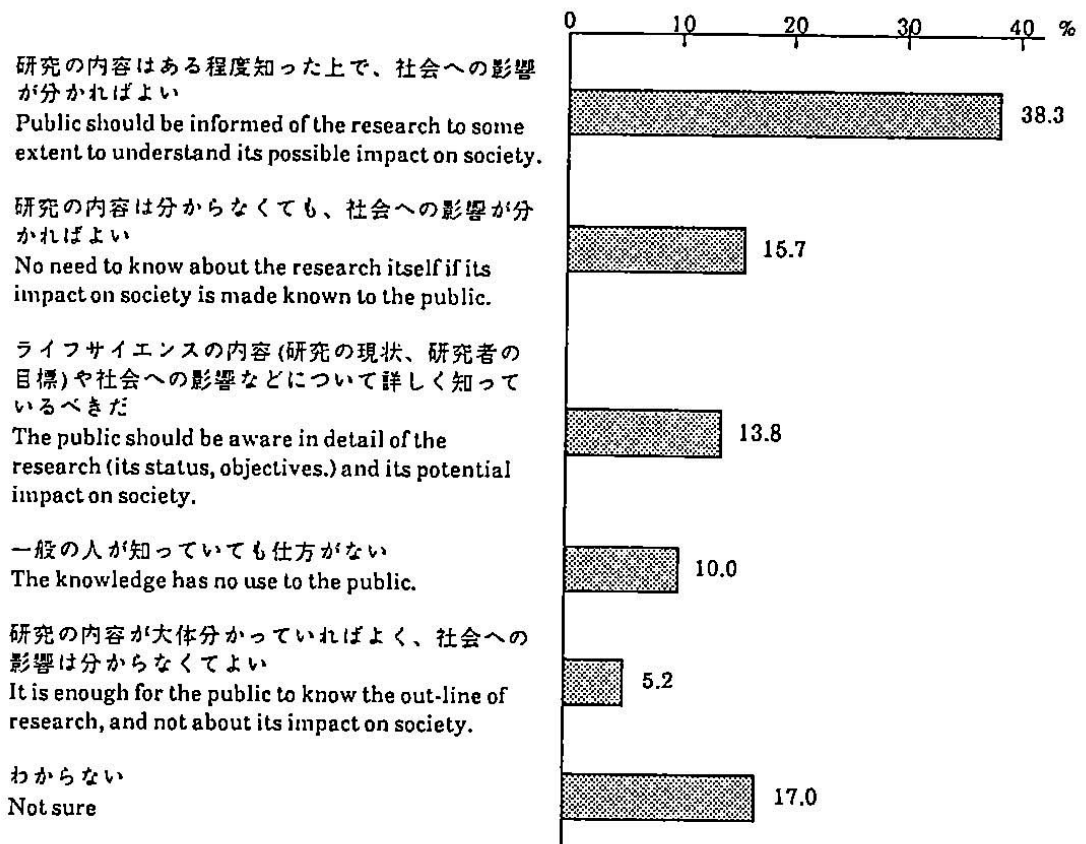
Fig. 4-13 How do you think life science research is being conducted and applied in society ?



(出典) 「ライフサイエンス(生命科学)に関する世論調査」(1985年12月調査)

(Source) Opinion Survey concerning life science (December, 1985)

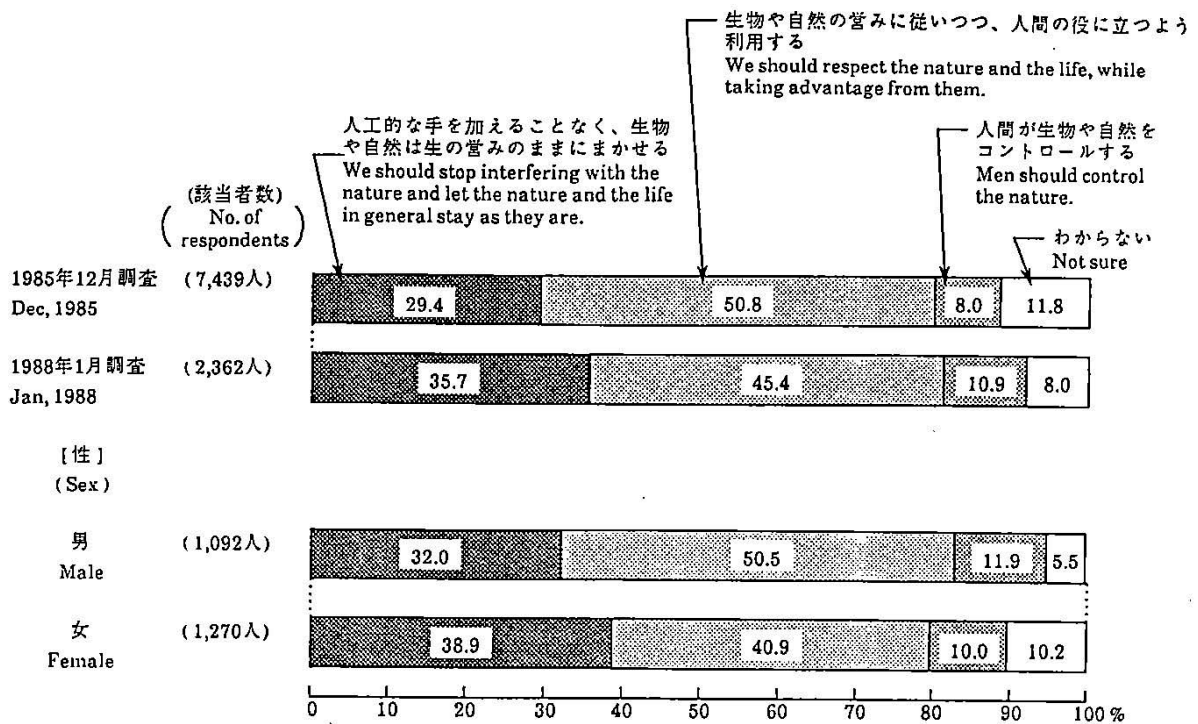
Fig. 4-14 To what extent should the public be made aware of life science experiments ?



(出典) 「ライフサイエンス(生命科学)に関する世論調査」(1985年12月調査)

(Source) Opinion Survey concerning life science (December, 1985)

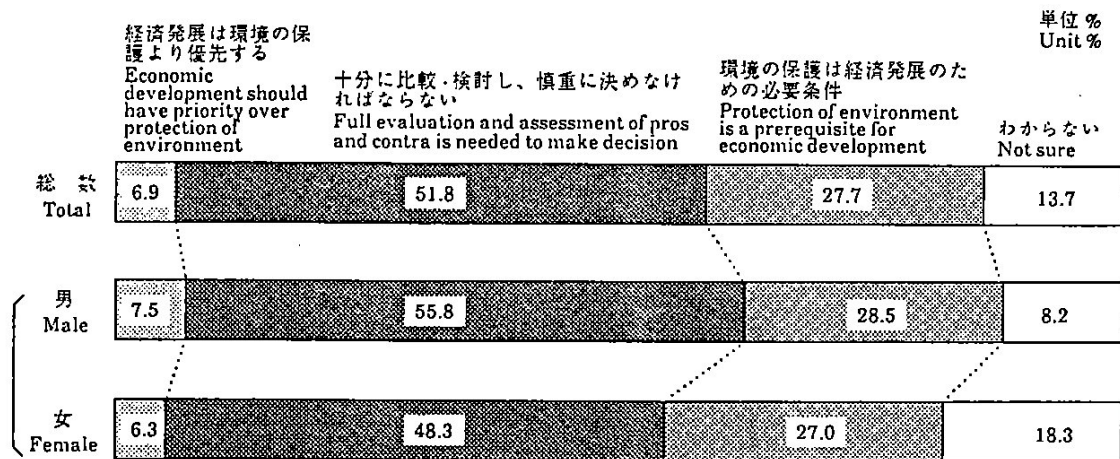
Fig. 5-1 The relationship between the nature and human life.



(出典) 「環境問題に関する世論調査」(1988年1月調査)
「ライフサイエンス(生命科学)に関する世論調査」(1985年12月調査)

(Source) Public opinion survey on environmental issues (January, 1988)
Opinion Survey concerning life science (December, 1985)

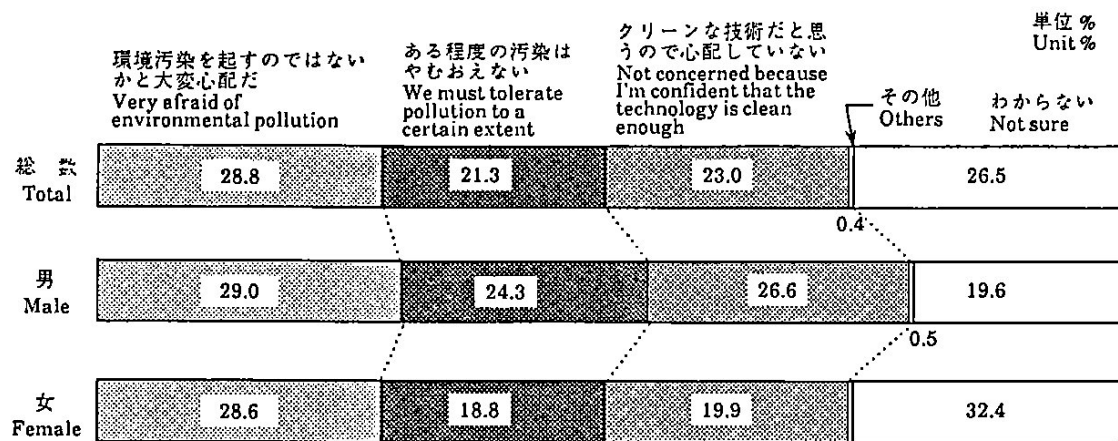
Fig. 5-2 The relationship between economic development and protection of environment and natural resources



(出典) 「環境問題に関する世論調査」(1988年1月調査)

(Source) Opinion Survey on environmental issues (Jan. 1988)

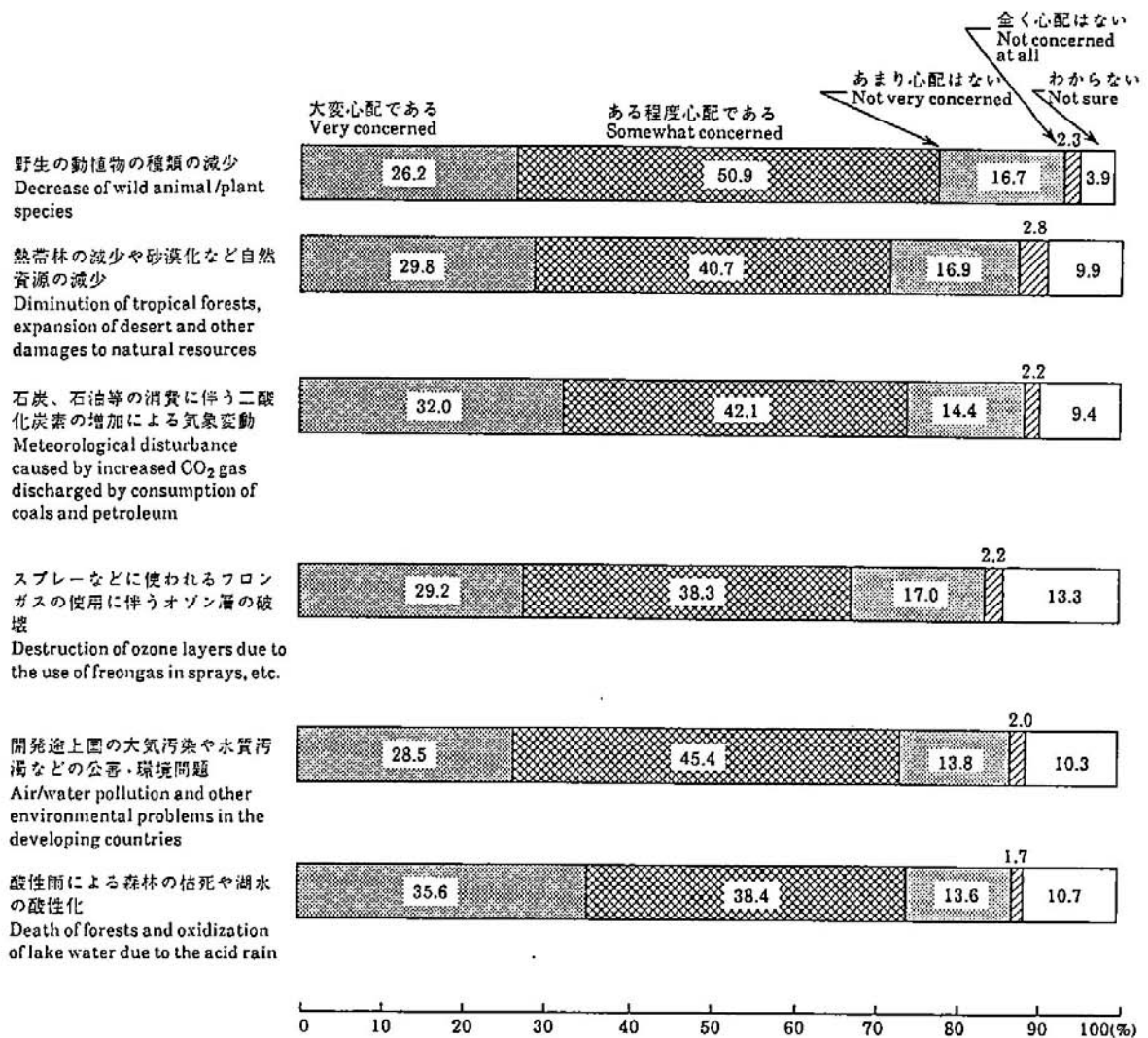
Fig. 5-3 Environmental issues resulting from technological development



(出典) 「環境問題に関する世論調査」(1988年1月調査)

(Source) Opinion Survey on environmental issues (Jan. 1988)

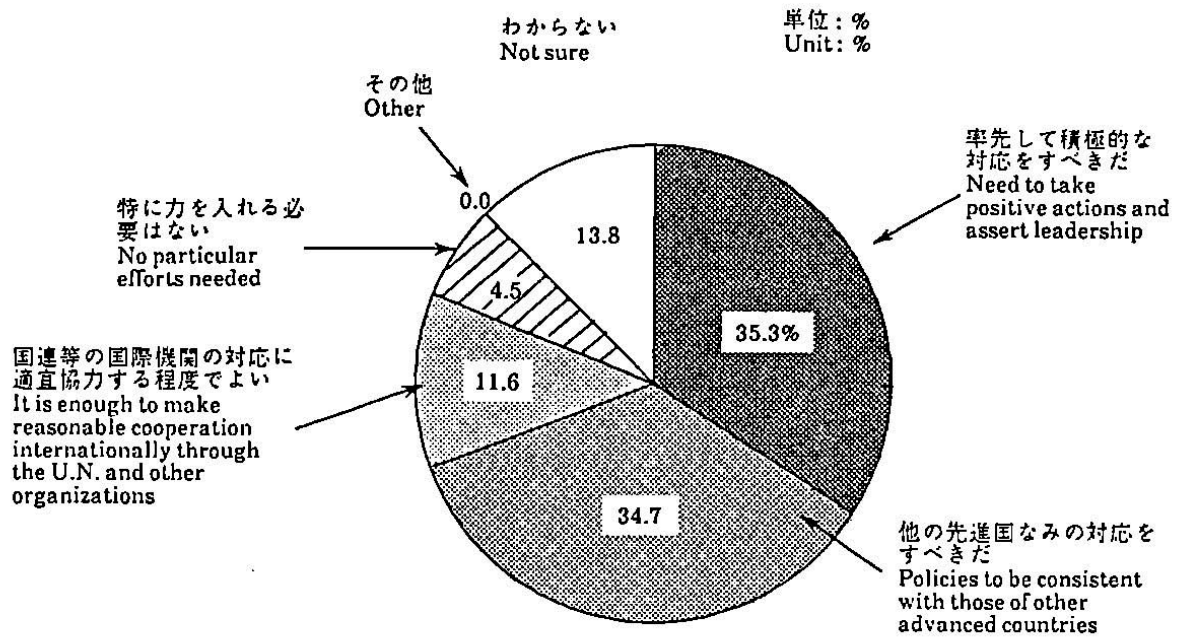
Fig. 5-4 Critical issues on the environment



(出典) 「環境問題に関する世論調査」(1988年1月調査)

(Source) Opinion Survey on environmental issues (Jan. 1988)

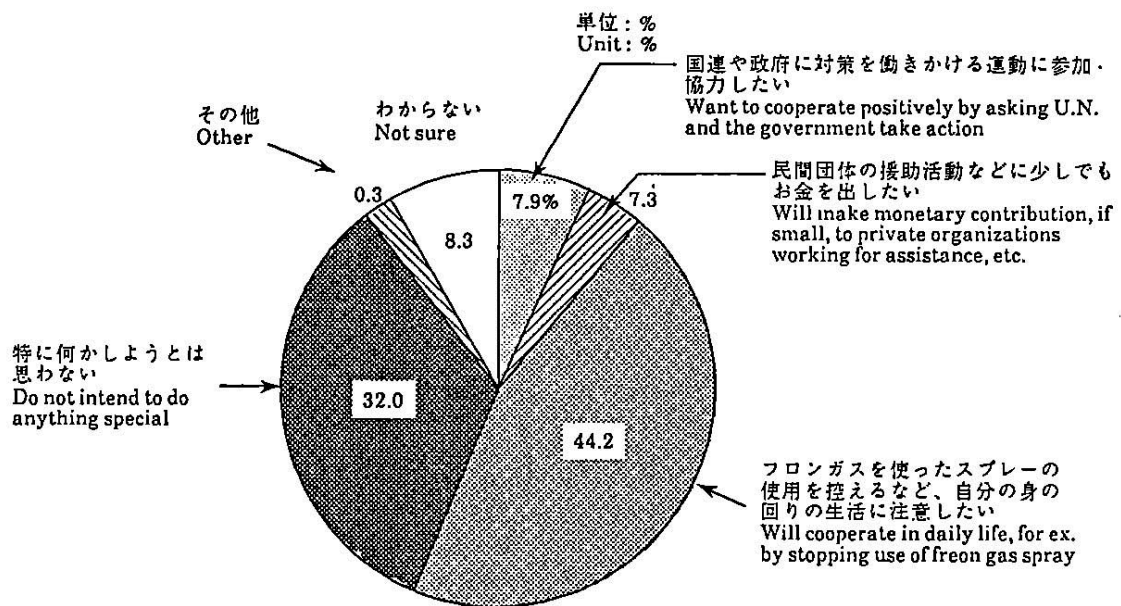
Fig. 5-5 Governmental policies concerning global environmental issues



(出典) 「環境問題に関する世論調査」(1988年1月調査)

(Source) Opinion Survey on environmental issues (January, 1988)

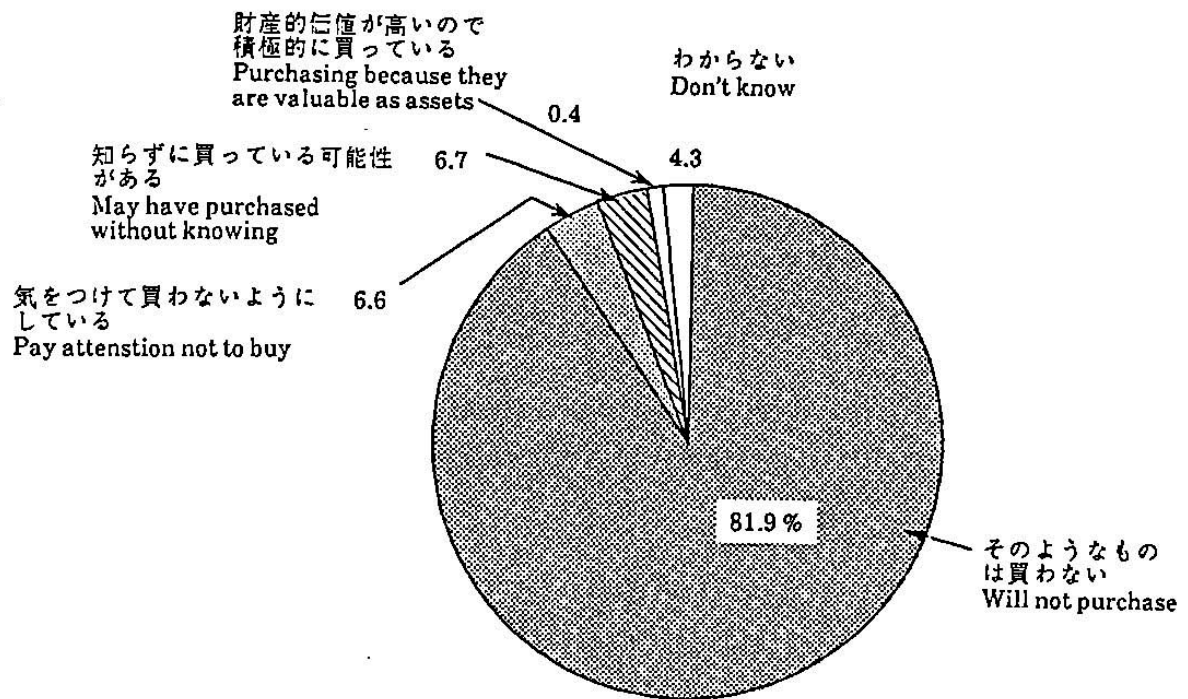
Fig. 5-6 Private cooperation to global environmental problems



(出典) 「環境問題に関する世論調査」(1988年1月調査)

(Source) Opinion Survey on environmental issues (January, 1988)

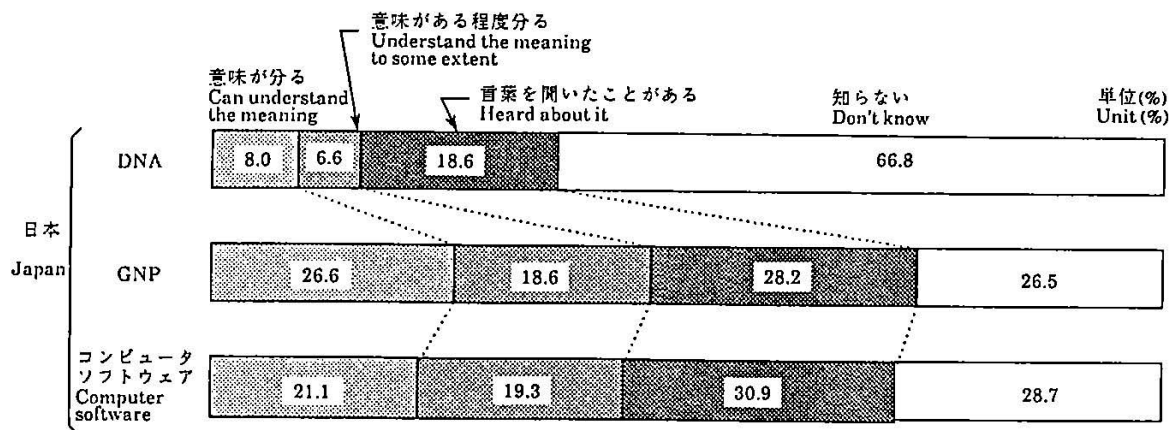
Fig. 5-7 Restrictions on purchase and trading wild animals/plants



(出典) 「環境問題に関する世論調査」(1988年1月調査)

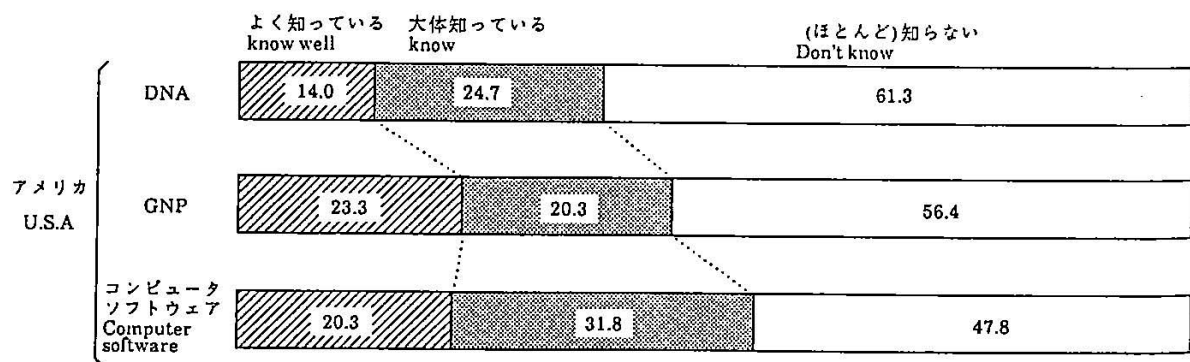
(Source) Opinion Survey on environmental issues (January, 1988)

Fig. 6-1 Public's familiarity with scientific and technical terms (Japan and U.S.)



(出典) 「科学技術と社会に関する世論調査」(1987年3月調査 2,334人)

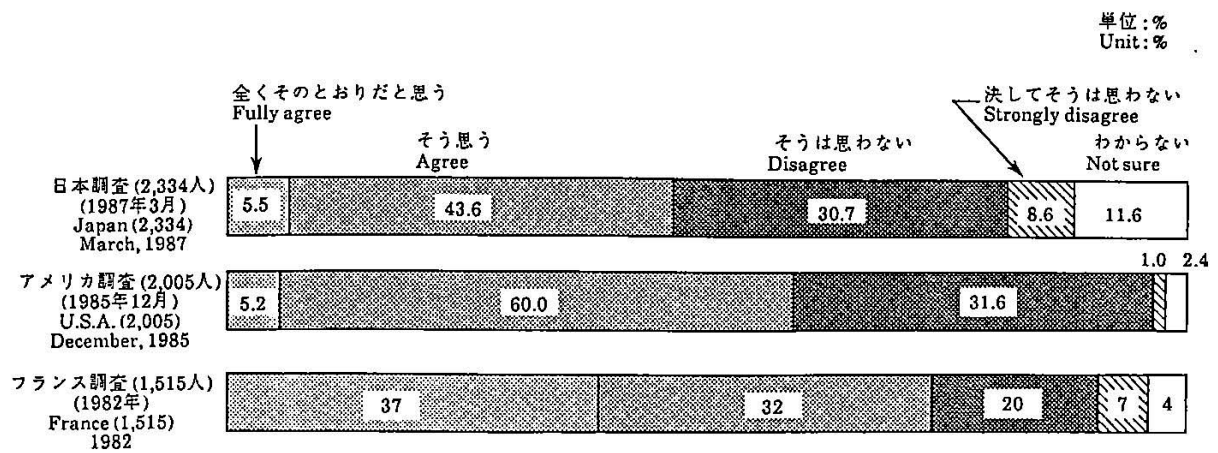
(Source) Survey on science, technology and society (March, 1987 for 2,344 individuals)



(出典) 「科学と技術に関する世論調査」(国立科学財団、1985年12月調査、2,005人)

(Source) Opinion Survey on science and technology (National Science Foundation, December 1985, for 2,005 individuals)

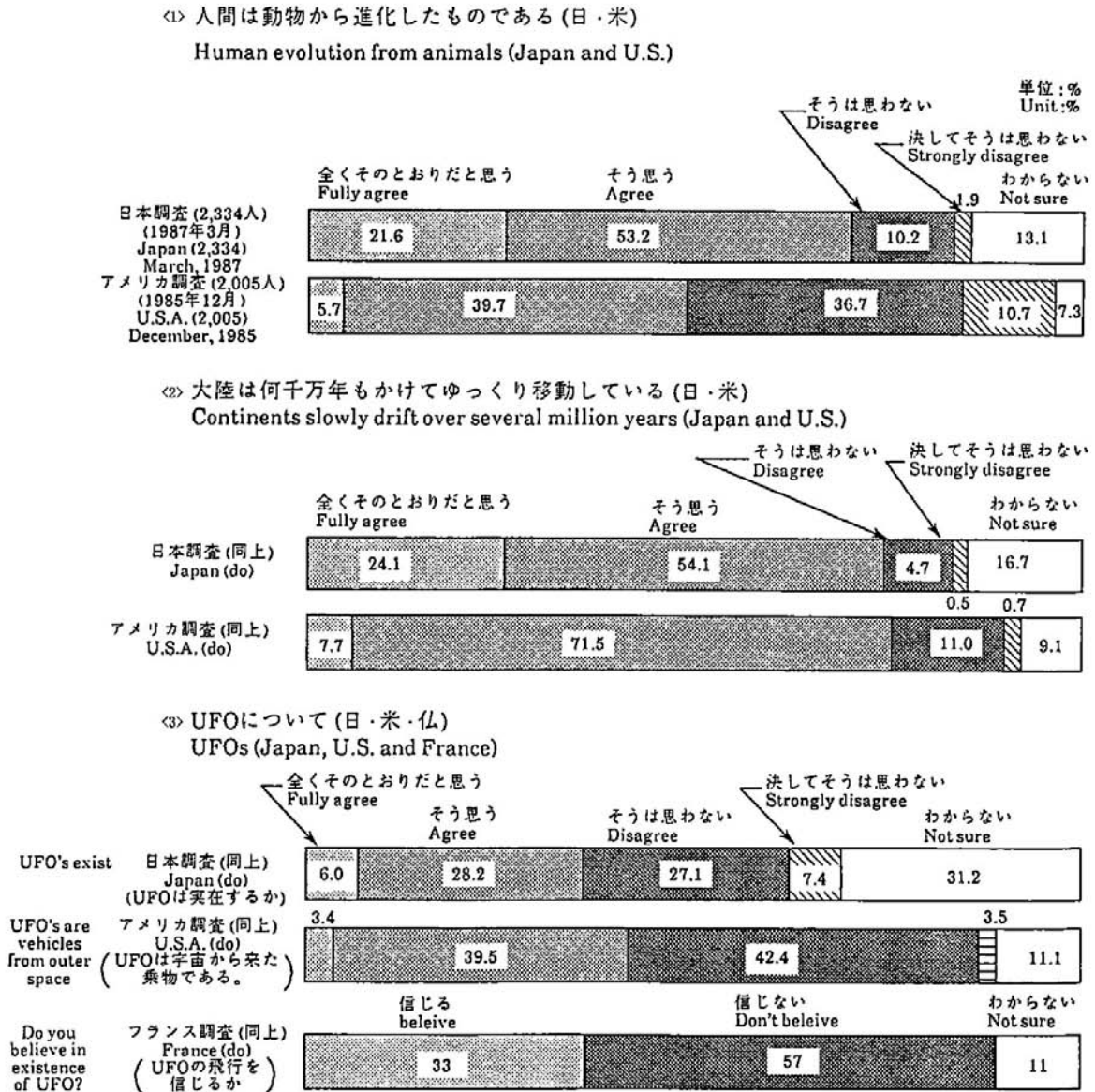
Fig. 6-2 Most people can understand scientific knowledge if it is explained in easy terms
(Japan, U.S. and France)



(出典) 「科学技術と社会に関する世論調査」(日本、総理府広報室)
「科学と技術に関する世論調査」(アメリカ、国立科学財団)
「科学と技術に関する世論調査」(フランス、ソフレ社)

(Source) Opinion Survey on Science /Technology and Society
(Japan, Public Relations Division, Prime Minister's Office)
Opinion Survey on Science and technology
(U.S.A., National Science Foundation)
Opinion Survey on Science and technology
(France, Sofres)

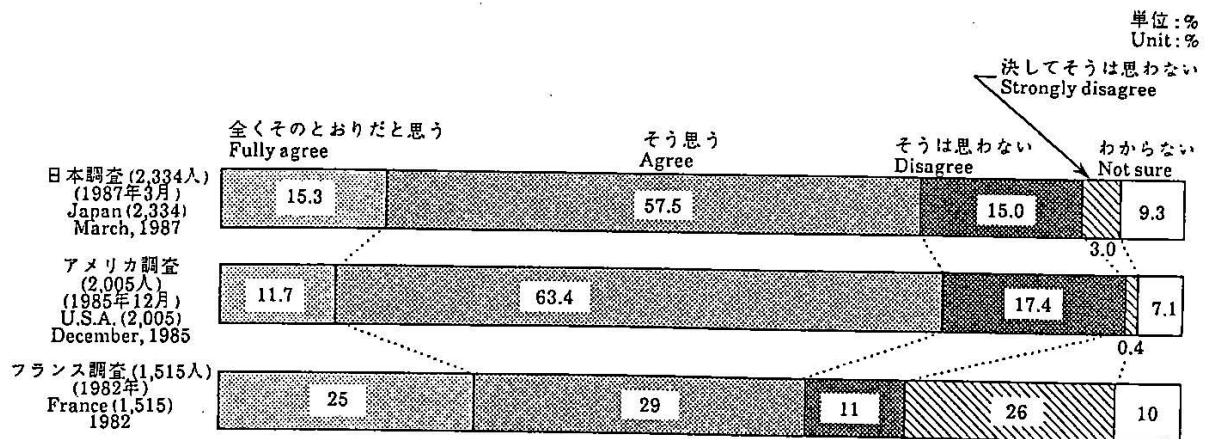
Fig. 6-3 Familiarity with scientific knowledge



(出典) 「科学技術と社会に関する世論調査」(日本、総理府広報室)
「科学と技術に関する世論調査」(アメリカ、国立科学財団)
「科学と技術に関する世論調査」(フランス、ソフレ社)

(Source) Opinion Survey on Science /technology and society
(Japan, Public Relations Division, Prime Minister's Office)
Opinion Survey on Science and Technology
(U.S.A., National Science Foundation)
Opinion Survey on Science and technology
(France, Sofres)

Fig. 6-4 Certain types of disease are better to be taken care of by methods other than that of modern medicine



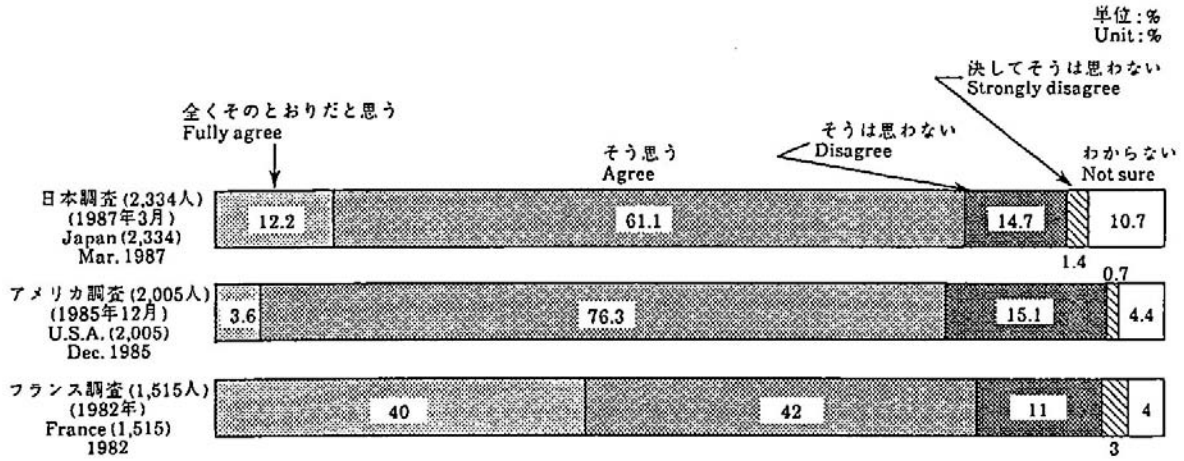
(出 典) 「科学技術と社会に関する世論調査」(日本、総理府広報室)
「科学と技術に関する世論調査」(アメリカ、国立科学財団)
「科学と技術に関する世論調査」(フランス、ソフレ社)

(Source) Opinion Survey on Science /technology and society
(Japan, Public Relations Division, Prime Minister's Office)
Opinion Survey on Science and technology
(U.S.A., National Science Foundation)
Opinion Survey on science and technology
(France, Sofres)

Fig. 6-5 Impression of scientists

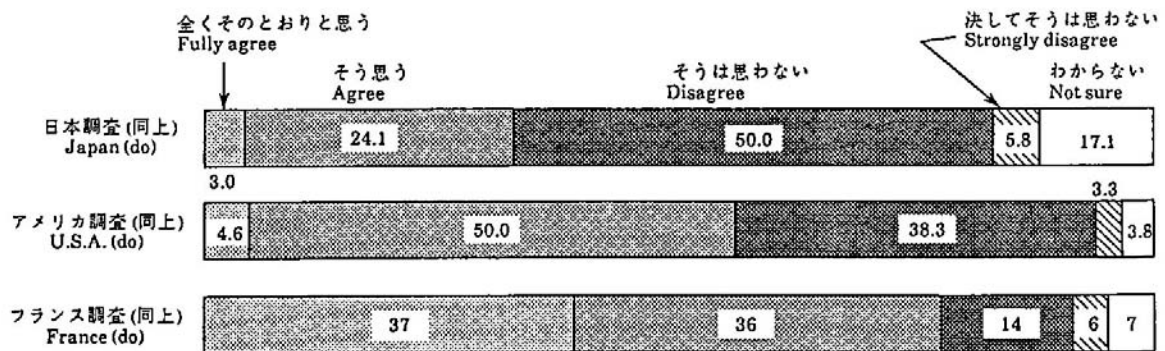
㉑ 科学者は人類のためになるよう努力している (日・米・仏)

Scientists are working hard to contribute the welfare of mankind (Japan, U.S. and France)



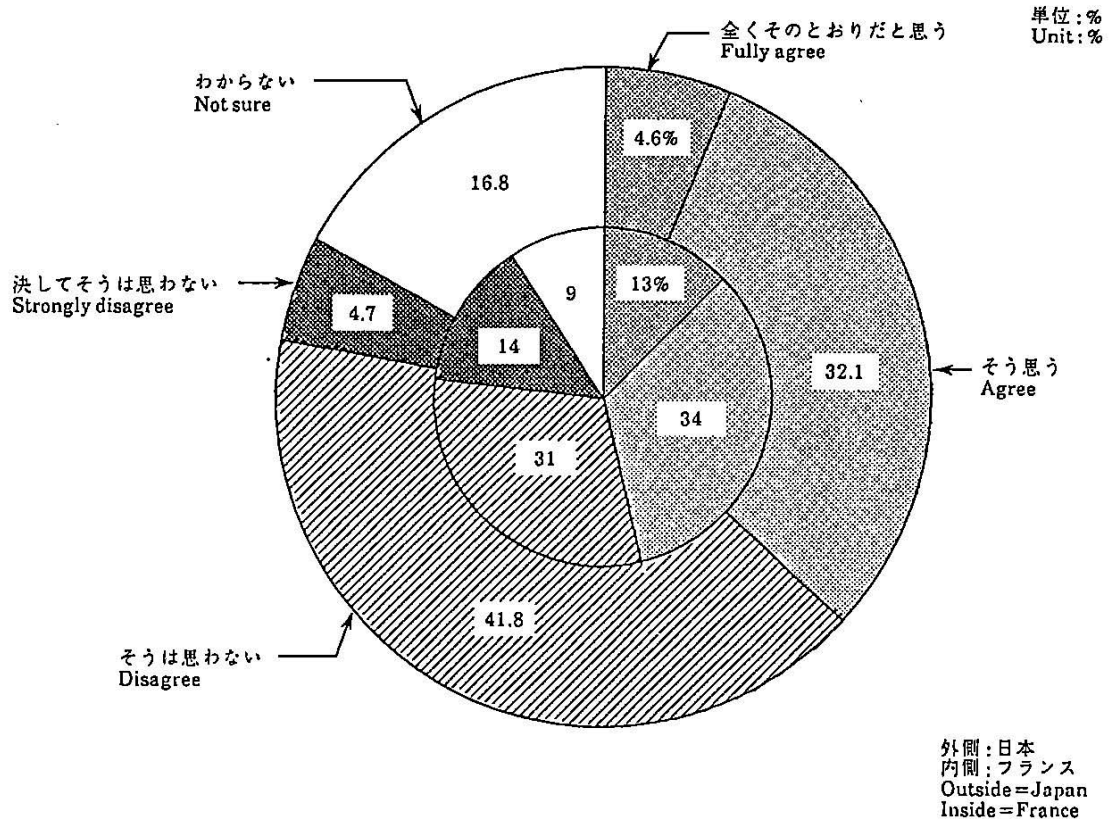
㉒ 科学者は知識を豊富に持っているので危険な存在となっている (日・米・仏)

Scientists are dangerous because they have abundant knowledge (Japan, U.S. and France)



◁ 科学者は人の役に立ちたいというよりはむしろ自分達の好奇心を満たすために研究している(日・仏)

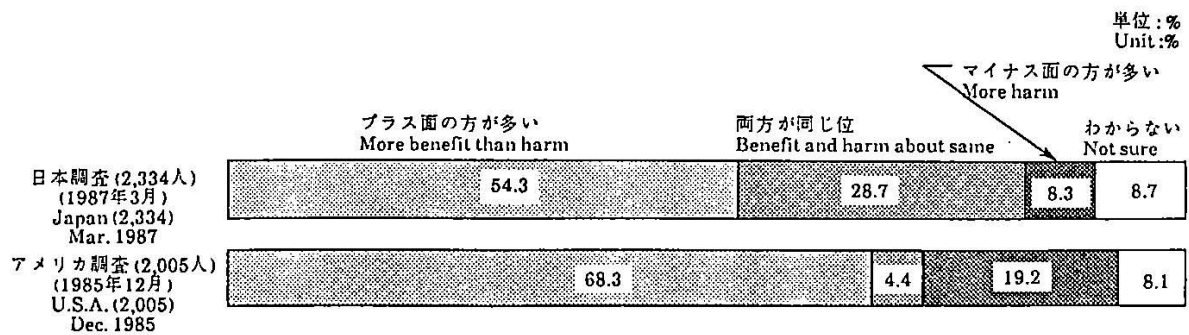
Scientists are doing research because they want to satisfy their curiosity rather than to contribute to humanbeing (Japan and France)



(出典) 「科学技術と社会に関する世論調査」(日本、総理府広報室)
「科学と技術に関する世論調査」(アメリカ、国立科学財団)
「科学と技術に関する世論調査」(フランス、ソフレ社)

(Source) Opinion Survey on Science /Technology and Society
(Japan, Public Relations Division, Prime Minister's Office)
Opinion Survey on Science and Technology
(U.S.A., National Science Foundation)
Opinion Survey on Science and technology
(France, Sofres)

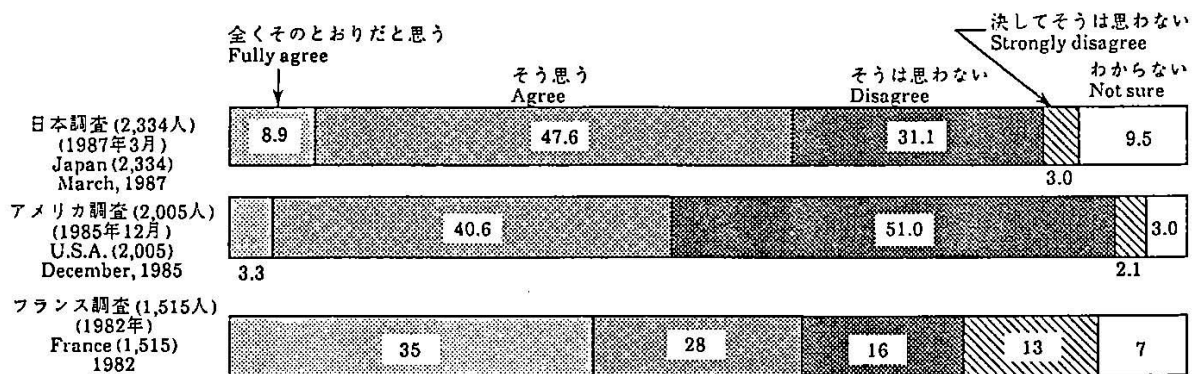
Fig. 6-6 Is development of science and technology bringing us more benefit than harm?
(Japan and U.S.)



(出典) 「科学技術と社会に関する世論調査」(日本、総理府広報室)
「科学と技術に関する世論調査」(アメリカ、国立科学財団)

(Source) "Opinion Survey on science/technology and society"
(Japan, Public Relations Agency, Prime Minister's Office)
"Opinion Survey on science and technology, U.S.A., National Science Foundation"

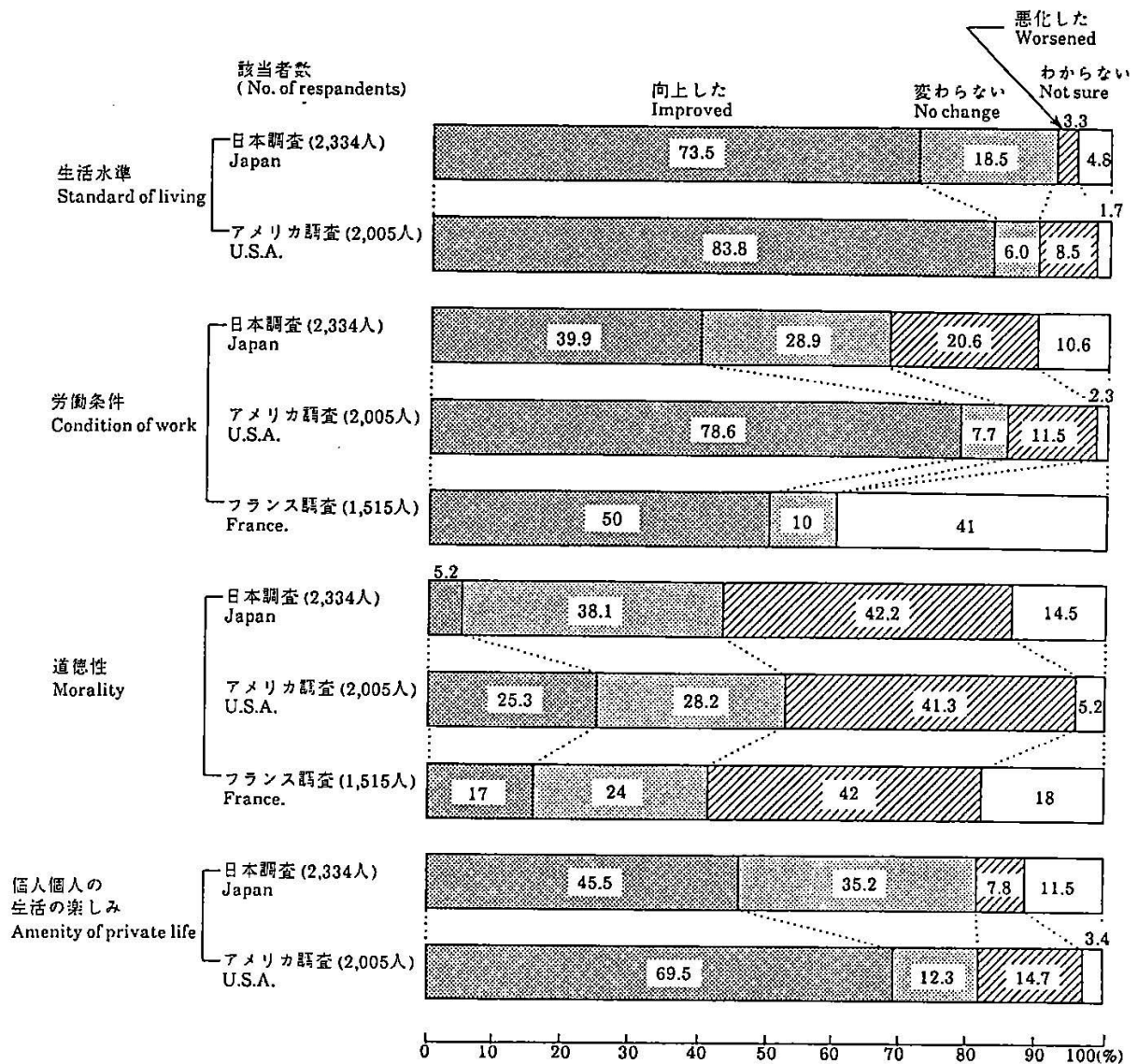
Fig. 6-7 Do you think that development of science and technology cause excessive changes in our lives?
(Japan, U.S. and France)



(出典) 「科学技術と社会に関する世論調査」(日本、総理府広報室)
「科学及び技術に関する世論調査」(アメリカ、国立科学財団)
「科学及び技術に関する世論調査」(アメリカ、ソフレ社)

(Source) "Opinion Survey on science/technology and society"
(Japan, Public Relations Division, Prime Minister's Office)
"Opinion Survey on science and technology" (U.S.A., National Science Foundation)
"Opinion Survey on science and technology" (France, Sofres)

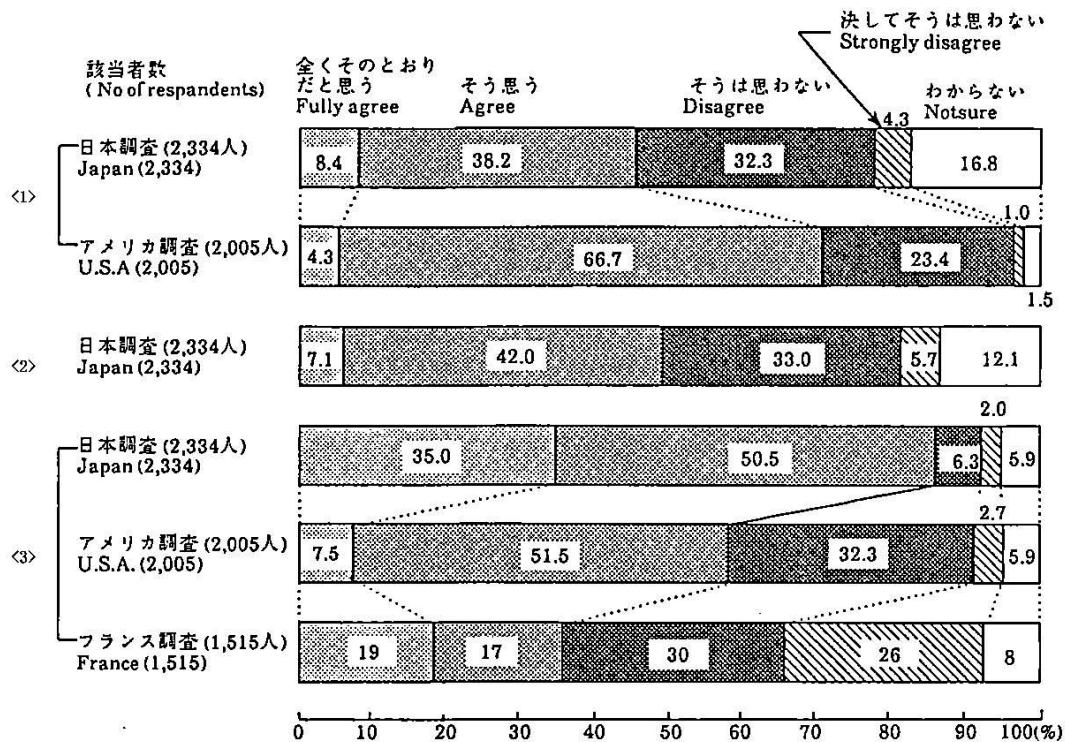
Fig. 6-8 Has development of science and technology contributed to improvement of mankind ?
(Japan, U.S. and France)



(出典) 「科学技術と社会に関する世論調査」(日本、総理府広報室、1987年3月調査)
「科学技術と社会に関する世論調査」(アメリカ、国立科学財団、1985年12月調査)
「科学技術と社会に関する世論調査」(フランス、ソフレ社、1982年調査)

(Source) "Opinion Survey on science/technology and society"
(Japan, Public Relations Division, Prime Minister's Office, Mar., 1987)
"Opinion Survey on science and technology"
(U.S.A., National Science Foundation, Dec., 1985)
"Opinion Survey on science and technology" (France, Sofres)

Fig. 6-9 what will the development of science and technology bring to us ?
(Japan, U.S. and France)



(備考)

- <1> 科学技術が発達すると、仕事はより面白いものになる
- <2> 科学技術が発達すると我々の生活はよりゆとりのあるものになる
- <3> 科学技術が発達しても、人間の心の中までは解明できない

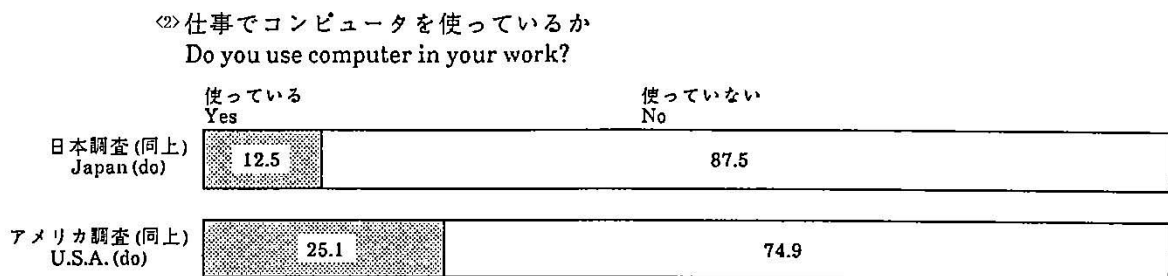
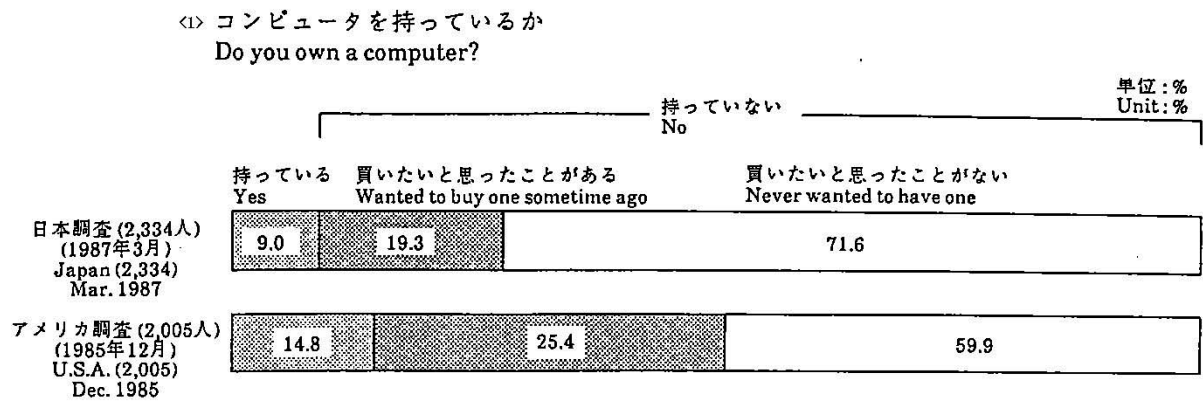
(Note)

- <1> Development of science and technology will make jobs more interesting
- <2> Development of science and technology will make our life more affluent and relaxing
- <3> Even the development of science and technology will not allow us to clarify what is happening in our mind

- (出典) 「科学技術と社会に関する世論調査」(日本、総理府広報室、1987年3月調査)
「科学技術に関する世論調査」(アメリカ、国立科学財団、1985年12月調査)
「科学技術に関する世論調査」(フランス、ソフレ社、1982年調査)

- (Source) "Opinion Survey on science/technology and society"
(Japan, Public Relations Division, Prime Minister's Office, March., 1987)
"Opinion Survey on science and technology"
(U.S.A., National Science Foundation, December., 1985)
"Opinion Survey on science and technology" (France, Sofres 1982)

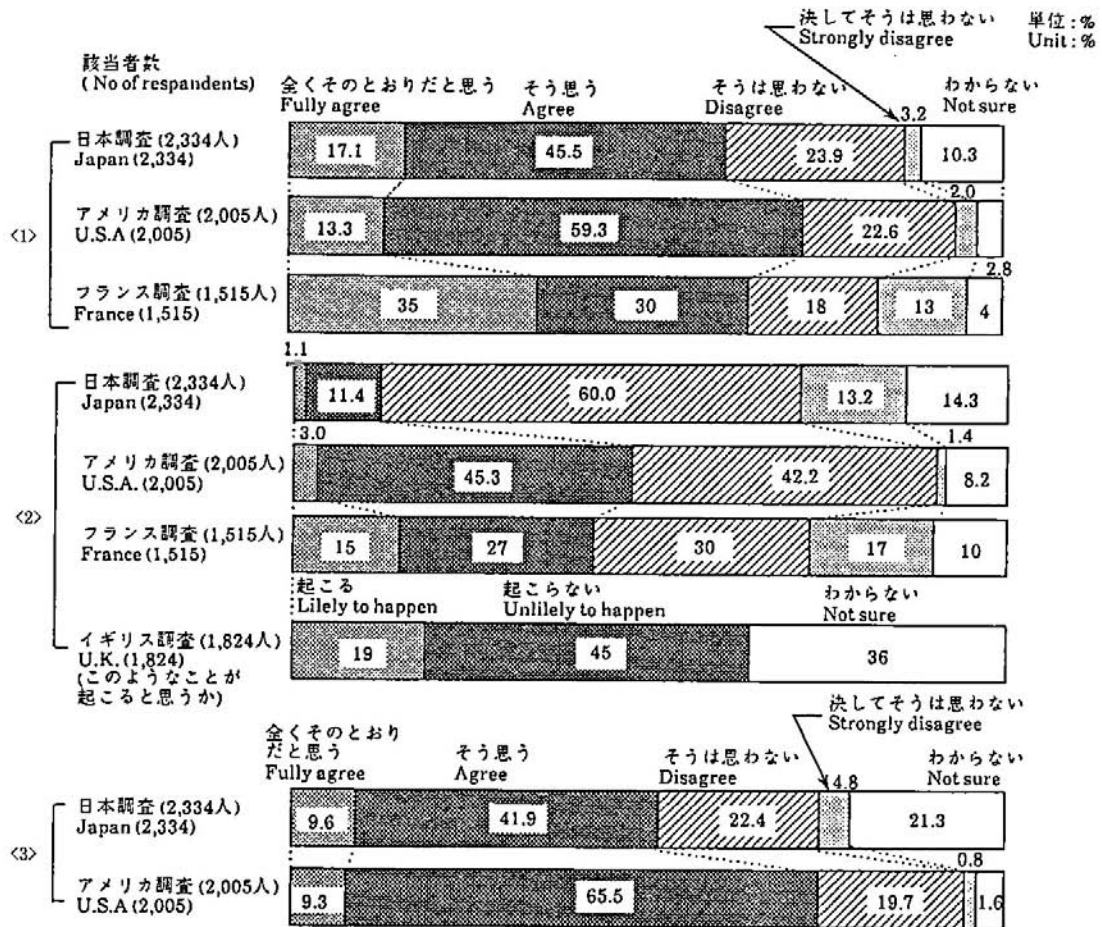
Fig. 6-10 Ownership and usage of computers (Japan and U.S.)



(出典) 「科学技術と社会に関する世論調査」(日本、総理府広報室)
「科学と技術に関する世論調査」(アメリカ、国立科学財団)

(Source) "Opinion Survey on science/technology and society"
(Japan, Public Relations Division, Prime Minister's Office)
"Opinion Survey on science and technology"
(U.S.A., National Science Foundation)

Fig. 6-11 Awareness of the diffusion of robots and computers (Japan, U.S. and France and U.K.)



- (備考) <1> ロボットやコンコンピュータが普及すると何十万人もの人が失業する
 <2> ロボットやコンコンピュータの普及により働き口は増える
 <3> ロボットやコンコンピュータが普及しないと外国製品との価格競争に勝てない
- (Note) <1> Diffusion of robots and computers will cause several hundreds of thousands jobs lost
 <2> Diffusion of robots and computers will create more jobs
 <3> Unless more robots and computers are used, we cannot win the competition with cheaper products coming from foreign countries

(出典) 「科学技術と社会に関する世論調査」(日本、総理府広報室、1987年3月調査)
 「科学と技術に関する世論調査」(アメリカ、国立科学財団、1985年12月調査)
 「科学と技術に関する世論調査」(フランス、ソフレ社、1982年)
 「新しい技術に関する世論調査」(イギリス、テクニカルチェンジセンター、1985年6月)

(Source) "Opinion Survey on science/technology and society"
 (Japan, Public Relations Division, Prime Minister's Office, March 1987)
 "Opinion Survey on science and technology"
 (U.S.A., National Science Foundation, December, 1985)
 "Opinion Survey on science and technology" (France, Sofre 1982)
 "Opinion Survey on new technology"
 (U.K., the Technical Change Centre, June 1985)

Table. 6-1 The relationship between the economic development and the protection of environment and natural resources (Japan and EC countries)

	No of respondents	Economic development should have priority over protection of environment	It is necessary to compare the advantage and disadvantages very carefully before making a decision	Environmental protection is a condition necessary for economic development	Not sure
	人	%	%	%	%
Japan	2,362	6.9	51.8	27.7	13.7
E.C.	11,840	9	32	50	9
Belgium	1,008	8	49	35	8
Denmark	1,043	3	30	55	12
France	1,003	11	29	56	4
Germany	987	3	41	50	6
Greece	1,000	12	23	47	18
Ireland	1,002	23	26	40	11
Italy	1,106	6	32	55	7
Luxenburg	299	6	28	65	1
Netherland	1,001	9	40	45	6
Portugal	1,000	11	33	38	18
Spain	1,008	12	17	47	24
U.K.	1,383	11	32	48	9

The Europeans are above the age of 15

(Source) "Eurobarometer" (E.C. Commission, Survey made from march to April, 1986)

"Opinion Survey on Environmental Problems"

(Public relations Division, Prime Minister's Office, January 1988)

Table. 6-2 Decrease of species of wild animals and plants (Japan and EC countries)

	No of respondents	Very concerned	Some what concerned	Not very concerned	Not concerned at all	Not sure	Index(Note)
	人	%	%	%	%	%	(points)
Japan	2,362	26.2	50.9	16.7	2.3	3.9	2.05
E.C.	11,840	42	37	14	5	2	2.19
Belgium	1,008	28	32	22	13	5	1.78
Denmark	1,043	47	26	19	5	3	2.17
France	1,003	42	34	16	6	2	2.15
Germany	987	38	45	15	1	1	2.21
Greece	1,000	35	22	17	19	7	1.79
Ireland	1,002	21	34	28	14	3	1.63
Italy	1,106	45	40	11	3	1	2.28
Luxenburg	299	58	22	13	5	2	2.37
Netherland	1,001	47	34	13	5	1	2.25
Portugal	1,000	40	33	10	9	8	2.13
Spain	1,008	51	35	7	3	4	2.39
U.K.	1,383	43	36	14	6	1	2.18

The Europeans are above the age of 15

(Note) The index points are the averages of each response weighted as follows, The answer "not sure" have been omitted in the calculation

Response	Very concerned	Some what concerned	Not very conerned	Not concerned at all
Weighting	3	2	1	0

(Source) "Eurobarometer" (E.C. Commission, Survey made from march to April, 1986)
 "Opinion Survey on Environmental Problems"
 (Public relations Division, Prime Minister's Office, January 1988)

Table. 6-3 Decrease of natural resources (Japan and EC countries)

	No of respondents	Very concerned	Some what concerned	Not very concerned	Not concerned at all	Not sure	Index
	人	%	%	%	%	%	(points)
Japan	2,362	29.8	40.7	16.9	2.8	9.9	2.08
E.C.	11,840	35	37	18	7	3	2.04
Belgium	1,008	27	29	26	13	5	1.73
Denmark	1,043	44	27	18	7	4	2.11
France	1,003	30	34	22	11	3	1.85
Germany	987	26	44	24	4	2	1.93
Greece	1,000	33	24	15	15	13	1.86
Ireland	1,002	22	38	25	12	3	1.71
Italy	1,106	40	40	13	3	4	2.21
Luxenburg	299	36	28	20	10	6	1.95
Netherland	1,001	33	34	23	8	2	1.95
Portugal	1,000	37	32	13	7	11	2.11
Spain	1,008	46	37	8	4	5	2.32
U.K.	1,383	40	37	14	7	2	2.12

The Europeans are above the age of 15

(Source) "Eurobarometer" (E.C. Commission, Survey made from march to April, 1986)

"Opinion Survey on Environmental Problems" (Public relations Division, Prime Minister's Office, January 1988)

Table. 6-4 Meteorological changes caused by the increase of CO₂ in the atmosphere (Japan and EC countries)

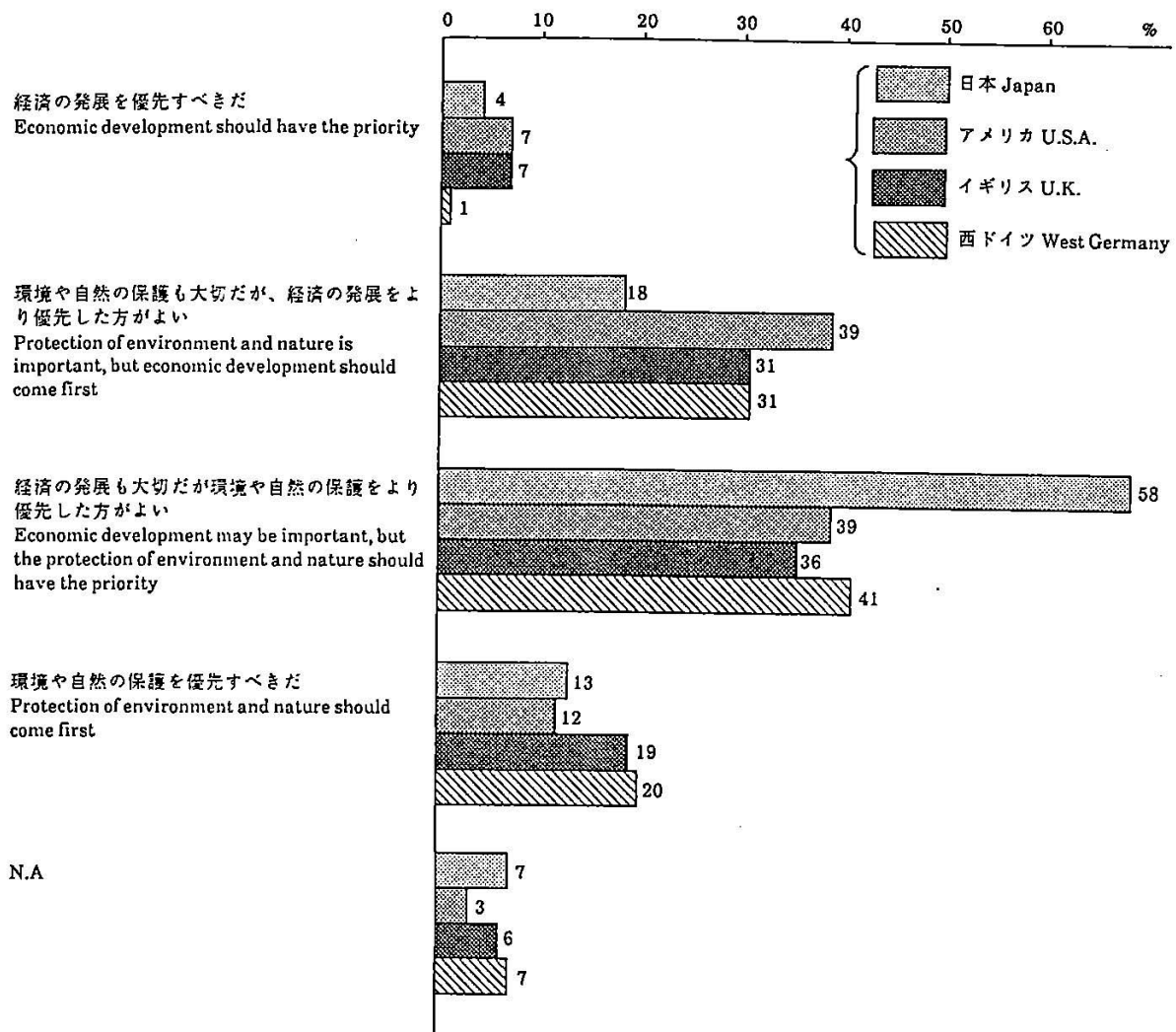
	Number of respondents	Very concerned	Rather concerned	Not very concerned	Not concerned at all	Not sure	Index
	人	%	%	%	%	%	(Point)
Japan	2,362	32.0	42.1	14.4	2.2	9.4	2.14
E.C.	11,840	38	33	16	8	5	2.06
Belgium	1,008	28	25	26	16	5	1.68
Denmark	1,043	44	28	17	7	4	2.15
France	1,003	36	29	19	12	4	1.92
Germany	987	32	41	19	5	3	2.03
Greece	1,000	38	21	15	13	13	1.96
Ireland	1,002	30	34	21	12	3	1.84
Italy	1,106	46	33	12	4	5	2.29
Luxenburg	299	48	25	14	9	4	2.17
Netherland	1,001	28	33	23	10	6	1.84
Portugal	1,000	42	29	9	7	13	2.22
Spain	1,008	43	33	11	6	7	2.21
U.K.	1,383	37	33	17	9	4	2.01

The Europeans are above the age of 15.

(Source) "Eurobarometer" (E.C. Commission, Survey made from march to April, 1986)

"Opinion Survey on Environmental Problems" (Public relations Division, Prime Minister's Office, January 1988)

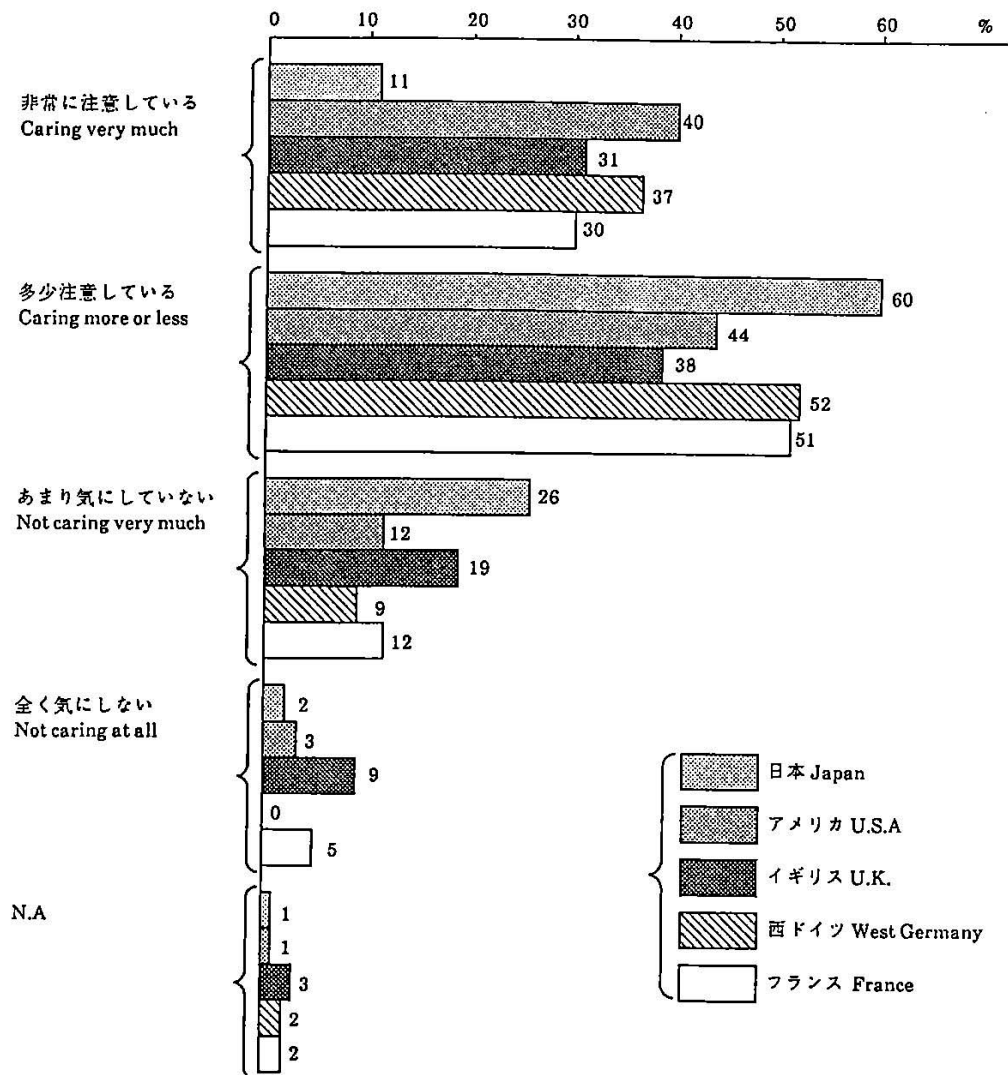
Fig. 6-12 The economic development and protection of environment and natural resources
(Japan and EC countries)



(出典) 「環境問題と税金問題に関する日米欧共同調査」(読売新聞社、ギャラップ社、1989年3月)

(Source) Japan, U.S.A. and Europe joint survey on public opinions concerning environment and taxes
(The Yomiuri Newspapers and Gallup, March 1989)

Fig. 6-13 How much do you take care in your daily life in order to avoid damaging the environment and nature?



(出典) 「環境問題と税金問題に関する日米欧共同調査」(読売新聞社、ギャラップ社、1989年3月)

(Source) Japan, U.S.A. and Europe joint survey on public opinions concerning environment and taxes (The Yomiuri Newspapers and Gallup, March 1989)

List of the Opinion Surveys referred to in this Report

(1) Opinion Surveys operated by Public Relations Division, Prime Minister's Office

	Year, Month	Name of Opinion Survey
1)	1975.10	Opinion Survey on Nuclear Power Plants
2)	1976.2	Opinion Survey on Computer Use
3)	1976.10	Opinion Survey on science, Technology and Nuclear Power
4)	1978.2	Opinion Survey on Energy and Resource Use
5)	1980.2	Opinion Survey on Energy and Resource Use
6)	1980.11	Opinion Survey on Energy Use
7)	1981.2	Opinion Survey on Privacy Protection
8)	1981.11	Opinion Survey on Energy Use
9)	1981.12	Opinion Survey on Science and Technology
10)	1982.7	Opinion Survey on Science and Technology
11)	1984.3	Opinion Survey on Nuclear Power
12)	1984.10	Opinion Survey on Environmental Problems
13)	1985.7	Opinion Survey on Protection of Personal Information
14)	1985.12	Opinion Survey on Life Science
15)	1986.2	Opinion Survey on Understanding of Science and Technology
16)	1987.3	Opinion Survey on Science, Technology and Society
17)	1987.6	Opinion Survey on Health and Medical Services
18)	1987.8	Opinion Survey on Nuclear Power
19)	1987.12	Opinion Survey on Social Consciousness
20)	1988.1	Opinion Survey on Environmental Problems

(2) Other Opinion Surveys

	Year, Month	Name of Survey	Operation Body
1)	1982	Opinion Survey on Science and Technology	France:Sofres (Co.Ltd.)
2)	1985.6	Opinion Survey on New Technologies	U.K.:The Technical Change Centre
3)	1985.12	Opinion Survey on Science and Technology	U.S.A.:National Science Foundation
4)	1986.3~4	Euro-Barometer	EC:EC Committee
5)	1989.3	Cooperative Opinion Survey on Environmental Problems in Japan, U.S.A. and European Countries	Japan : Yomiuri Newspaper Co. Ltd. U.S.A. and Europe: Gallup Research Co.Ltd.
6)	1984.2.,11. 1985.11	Yomiuri National Opinion Survey	Japan:Yomiuri Newspaper Co. Ltd.
7)	1985	Opinion Survey on “Joho-Society” and Daily Life	Japan : Liason Office of “Joho”, the Tokyo Metropolitan Government
8)	1988.3	Opinion Survey on Nuclear Power Plant	Japan:Asahi Newspaper Co. Ltd.