CHAPTER 5.
Discussion and Lessons

1. Approach to environmental pollution before the outbreak of damages to health or before discovery of damages to health

[*Discussion 1*]
The ideal mechanisms underlying the early comprehension of abnormalities in living things, its use for the prevention of damages to health, and the early detection of damages to health.

(1) Circumstances

Nihon Chisso Hiryo K.K., the direct ancestor of the present company, Chisso, which was established in 1908, started producing acetaldehyde at the Minamata plant in 1932. The disputes between the Chisso Minamata plant and the fishing people regarding contamination of the seas with waste water from the plant have already started since 1926 until 1968 when the operation was ceased.

The contamination in the vicinity of the Hyakken seaport was increased during the period from 1951 to 1952; the fishes in fish preserves died and smelled of stale fishes, and the fishery was decreased. The MFCA asked to the Fisheries Section of Kumamoto Prefecture the field survey.

In August 1952, Chief Clerk Reiji Miyoshi of the Fisheries Section of the prefecture conducted the field survey, and concluded that the reduced amount of fisheries as damages to fisheries has been caused by waste water directly flown from the Minamata plant and by the residues accumulating for a long time. He reported that it is desirable to analyze and clarify the components of the waste water if necessary. However, no countermeasures were considered against the results of the survey.

Since about 1953, it has been observed that cats died mad and birds showed abnormalities in the fishing villages around Minamata Bay. In 1954, the fishing people proposed Health Section of Minamata City to get rid of rats, because the number of the cats was suddenly decreased and the number of the rats was increased.

In 1953 to about 1955, patients with strange nervous symptoms started being observed, and they came to receive examination. However, any diagnosis was not made, and the diseases of the patients were not considered one same disease.

(2) Discussion

A. Prevention of environmental pollution by the companies themselves

The companies that deal with harmful substances are in duty bound to collect not only useful information on production but also information on toxicity of the substance. Since certain implementation of the collection will not be led by the independency alone of the companies, the legal framework, which will make the companies to comprehend potent toxic substances by means of PRTR (drainage of environmental pollutants, registration of transfer) systems and so on, is also necessary. Reports on environment based on the third-party audit should be presented by establishing some divisions, like the environmental preservation department, in companies and stationing specialized staff members there, and by obtaining the ISO certification for environmental management. Thus, the companies must fulfil their responsibility.

B. Correlations between abnormalities in living things and the influence on human health in Minamata

1) The outbreak of damages to human health due to environmental pollution was preceded by damages to

animals and plants in many cases. In the case of Minamata as well, abnormal changes have been observed in living things such as fishes, birds, and cats.

2) In the villages of fishing people, the cats died mad, and the number of the rats was acutely increased. Health Section of Minamata City was asked to get rid of rats, because fishing nets were bit off by the rats. The Government did not pursue to determine the cause, despite the fact that the inhabitants were very anxious about the miserable phenomena in the cats of the district. In the social sense about public health at that time, it may have been considered tentatively adequate as the countermeasure against these phenomena to get rid of rats. The abnormal phenomena in cats and birds were overlooked without further consideration, partly thereby making the phenomena to have been beyond remedy. Specific attention should have been paid to the fact that the inhabitants of the district (fishing people) were eating in large quantities the same fishes as those given to the cats, and the fact should have been discussed.

In those days, some fishing people brought ships to the area in the vicinity of the Hyakken Outfall as a protection against worms, because sea lice did not stick to any fishing boat moored at the area. The fishing people have known that the factory wastes had the strong insecticidal action.

3) The outbreak of damages to fisheries should be regarded as signs of the outbreak of damages to the inhabitants' health, and the influence of the outbreak on ecosystem should be investigated. Since the report on the investigation of damages to fisheries, which was offered by Chief Clerk Reiji Miyoshi in 1952, indicated accurately the source of the contamination, the Government and investigators should also have set about making inquiries about the pollution.

If the Government had conducted appropriate measures by putting the report by Chief Clerk Miyoshi to practical use and the Minamata plant had obeyed them, the condition of the subsequent damages of Minamata disease should have been different from the real condition. The report by Chief Clerk Miyoshi was not put to practical use, because that the Government involving agricultural industry and fisheries in those days was designed only to protect resources and industries and that the following way of thinking about damages to fisheries has been dominant: financial compensation would solve problems with the damages to fisheries. This way of thinking about the damages became the factor for allowing even serious damages to men. If the damages to fishes and shellfishes had been revealed to be signs of the influence on human lives and health, such a result would not have been led.

The same way of thinking about environmental pollution is observed in the following case as well: even though many fowls, which had the foods containing PCB, died in the Kanemi Dark Oil Affair, nobody considered that the phenomenon would connect with that in humans, and the Ministry of Agriculture, Forestry and Fisheries had no connection with the Ministry of Health and Welfare.

C. Early detection of the influence of chemical substances on the nature and humans

1) The stage, in which abnormal changes occur in the process of transfer of specific chemical substances to living things and of concentration, varies with chemical substances. On considering an influence sensing system and damage-preventing countermeasures, the time when the countermeasures are considered and their contents are also dependent on the point as to whether the subjects include only "the influence on humans" or "the influence (including the influence on the specific type of reproductive function) on ecosystem excluding humans". With regard to countermeasures against chemical substances, the following are important tasks to be assessed: what kind of influence sensing system should be constructed? what should the countermeasures be against them? when should the countermeasures be considered on the basis of the results of the detection of influence?

The measurement of mercury level in feathers, which was reported in Sweden, is one of the good indicators of annual changes of the environment in the determination of the influence of chemical substances

on the natural world.

2) In the aspect of study, it is necessary to study for the early comprehension of abnormalities in the nature and ecosystem. Study from an interdisciplinary viewpoint is necessary for this purpose. Scientists show a strong tendency toward the qualifying pursuit of problems according to special fields. In Japan, there has been no viewpoint showing that conclusions are induced from comprehensive observation.

Even though observation of the nature as a whole reveals various things, it is difficult for articles to be written with such a theme. Therefore, scientists tend to conduct studies by which achievements would be easily produced; e.g., individual substance is examined for toxicity.

D. Mechanism of early discovery of damages of environmental pollution to health

1) Even though the ranking order of the structure of diseases changes from acute diseases to chronic ones, the health and medical government still decides the order of priority from mortality rate. This fact is considered one of the reasons for the failure in prompt countermeasures against damages to health. A special attention should be called to such a difference in the sense, as observed in medical specialists.

2) In the side of the health and environmental government, it is necessary for early comprehension of problems with damages of environmental pollution to health to form a network with the actual setting of medical care, to establish health monitoring in contaminated districts, and to foster and station health manpower for these purposes.

With regard to diseases of unknown cause, which are observed in the actual setting of medical care, it is important to early assess the possibility of environmental damages to health being present, to comprehend and report it, and to offer problems. Enlightenment of the consciousness of the side of medical care and the Government is requested and the system, in which the Government takes the initiative in requiring reports, is also needed to this purpose.

To prevent damages of environmental pollution, it is particularly necessary for medical organizations to act in cooperation with the Public Health Center, which conducts activities of surveillance and grasps the situation of environmental pollution.

3) The first “person who discovers damage” is the inhabitant him/herself in many cases. For the early discovery of damages to health as well, a system by which straight opinions of the inhabitants are heard is needed. In Minamata, the plant was the cause of the disease. This fact and the existence of fetal Minamata disease were consistent with “scents” of the inhabitants, i.e., the victims.

(3) Lessons

1) Detective susceptibility to abnormalities in living things

Abnormalities in living things are signs of their influence on humans. The inhabitants, companies, and the Government must become aware of them. Neglect and underestimation of the information obtained by observations lead to big damages.

2) Plans for the system of monitoring and analysis of the information offered from the natural world and of establishment of the countermeasures

In Minamata, it was the duty of the company and the Government primarily to understand some facts appearing as signs of risk in connection with each other, and to avoid the risk through freedom of

information and by considering necessary countermeasures against the risk. However, there were no division for the general comprehension of the signs or scientific, technological or interdisciplinary measures to counter them. This fact induced and expanded the damages. A system, by which information from the natural world is monitored and analyzed, and the necessary countermeasures are established, must be planned.

3) Mechanism of the Government, which allows the sensitive reaction to the inhabitants' opinions and specialists' findings and induces concrete activities

The Government should listen to straight opinions among the inhabitants, i.e., the first persons who discover the abnormal phenomena in environment and humans, without coming to anchor in the supreme position because it has special knowledge and rights, take up the abnormalities perceived by specialists of health and environment, and should be sensitive for reaction to these abnormalities. The criteria and framework, which are used for putting the collected information to practical use and bringing about concrete hehavior, must be established in the Government.

4) Freedom of information and the feedback by the Government

The information comprehended by the Government should be opened to the public at the maximum after appropriate comment is given so that the meaning will be understood. The results of examination of the samples from individual inhabitants should be returned to the person him/herself as a rule. This is essential for accelerating the participation of the inhabitants and obtaining their cooperation, who first offer information on environmental pollution.

5) Survey, study, and education of ecological system

As the ecological system of the local community, correlations among humans, water areas, biota, and social and cultural background factors must be comprehensively discussed in survey and study. The necessity of the education for the purpose is felt strongly.

2. Initial approach

[*Discussion 2*]
The ideal initial approach to the occurrence of a disease of unknown cause

(1) Circumstances

The measures to counter the patients in Minamata were initiated by the establishment of Minamata Strange Disease Countermeasures Commission of Minmata City by the actual setting of the Government and medical care on May 28 and the commencement of the survey on the situation of the outbreak after the official discovery of Minamata disease on May 1, 1956. As a result, it was revealed that a plurality of patients with the disease appeared in a specified area within the fixed period. The commission suspected an infectious disease as well in the beginning, and Health Section of Minamata City and the Public Health Center conducted disinfection as a countermeasure against the infectious disease. In July, the patients were dealt with under the diagnosis of suspected cases of Japanese encephalitis, and transferred into isolated wards for infectious diseases as an immediate measure.

The initial inspection of the cause of Minamata disease was proceeded by the City and Prefectural

Governments, the Ministry of Health and Welfare and Kumamoto University School of Medicine by arranging their investigation systems, respectively. Kumamoto University School of Medicine organized the Study Group of Kumamoto University School of Medicine for the Strange Disease in Minamata (the Kumamoto University Research Group) in August, 1956 by request from the Prefectural Government. The patients in the isolated wards for infectious diseases were admitted to the university hospital as those for teaching and education.

In the report by the Research Group on November 3, the suspicion of infectious diseases was almost ruled out from the clinical findings and the results of bacteriological examination. Heavy metal poisoning mediated by fishes and shellfishes was suspected, and attention was paid to waste water from the Chisso plant as the cause of the contamination.

As the approach to Minamata disease in Niigata, a system for the inspection of the cause has been established early by fully using the achievements of the studies on Minamata disease in Kumamoto, since May 31, 1965 when the report was offered. On June 16 of the year, the Niigata Prefecture and the School of Medicine, Niigata University established a research group and initiated health screening. The guidance for inspection of the cause and fishery was also quickly conducted.

(2) Discussion

A. Approach of people of the district at the time of the outbreak of Minamata disease

1) The cooperation system, which involved medical associations, medical organizations, the City Government, and the Public Health Center in Minamata City, after the official declaration of the outbreak of Minamata disease was highly evaluated. The role of the Public Health Center particularly as the coordinator in the field of health and hygiene was remarkable. In Niigata as well, the initial system for studies was successfully established by fully using the cases in Kumamoto.

2) Since the disease was considered not to have been experienced by any investigator from the situation of the outbreak and the clinical symptoms, it was necessary for inspection of the cause to analyze symptoms by observation close to patients. However, the system for “the patients used for teaching and education” was obliged to be used for the admission to Kumamoto University Hospital, because the Government or the Prefectural Government did not bear the hospital expenses. The limit of the patients used for teaching and education was usually about one in each division, but an exceptional special measure was taken; 6 and 8 patients were admitted to the Dept. Pediatrics and the First Dept. Internal Medicine, respectively.

B. A point left to be desired about the initial approach--Medical research

1) Judging from the situation of the outbreak in those days, acute infectious disease was suspected first in the name of common sense. Patients could also receive medical care without charge in the wards for infectious diseases. When the condition was revealed not to be infectious, the result should have been made known to the local community. The living conditions and opinions of fishing people should have been further observed and heard.

2) It took at least 3 months for the full-scale system for medical research to start, but the strong support from the university of the district should have been asked earlier. The Kumamoto Government has not offered any information collected in the past, such as the report by Reiji Miyoshi, on asking Kumamoto University School of Medicine to study. This fact accounted mainly for the prolonged process of the

subsequent inspection of the cause of the disease.

3) The system for inspection of the cause must be established as soon as possible, so that accurate approach to the disease will be early taken. With regard to countermeasures against patients as well, countermeasures against the widespread cases of the disease must be conducted as quickly as possible for the accurate approach to damages to health.

C. A point left to be desired about the initial approach--Approach of the company

1) The inspection of the cause of the disease proceeded uneventfully until the Kumamoto University Research Group suspected Chisso to be the source of pollution, but thereafter there have been trials and errors for a long time.

This is mainly because the plant did not open the details of the production process or allow an on-the-spot inspection or collection of samples. The Research Group did not pay attention to mercury at that time, saying "It is unbelievable that a large amount of expensive mercury has been thrown away", because the Group had only inadequate knowledge about chemical factories. If the substances used at chemical factories and the process, in which they are used, had been overtly shown, the source of the pollution would have been revealed earlier.

> [*Comments*] Mercury was described as a catalyst for the water addition reaction in the process of industrial production of acetaldehyde from acetylene in most textbooks of "chemistry" used at high schools in those days.

The attitude of the plant, which was suspected of being the causative company, is decisively important for inspection of the cause, and cooperation of the company in making activities of inspection of the cause is essential. The suspected plant is often uncooperative in the third-party's making activities of inspection of the cause, and attempts to cover the facts, which show that the plant itself is the source of the pollution. Even if the behavior can delay the inspection of the cause, the plant eventually bears the responsibility for the spread damages. The plant must keep this fact in mind.

2) In the case of Minamata disease, the methylmercury compound as the causative agent was a chemical substance generated secondarily in the process of reaction, and it was of no utility value for the company. These facts provided one cause of the delayed pursuit in the process of inspection of the cause.

D. A point left to be desired about the initial approach--Decision of countermeasures and politics by the Government

1) With regard to countermeasures in the initial approach, it is important for the Government to take promptly and actively the initiative in leading the people concerned to play appropriate roles. For this purpose, the Head of the Public Health Center and so on, who are persons in charge of the actual setting, must be authorized to solve problems and be given free hands in the problems.

Since it was revealed at the end of 1956 that the situation was very serious and 17 of 54 patients died, the Kumamoto Prefectural Government should have received the facts as the serious affair and requested officially the investigation of the factory wastes. The Ministry of Health and Welfare should also have supported the request officially and initiated group work in the Government.

> [*Comments*] Various stages are considered for the approach; e.g., a stage in which investigational study is conducted by preparing the budget and manpower for the study or in which countermeasures such as fishery control, etc. are assessed, a stage in which legal measures, such as an order to cease the causative behavior,

are considered, a stage in which necessary legislative measures are conducted, and a stage in which measures to compensate after the fact is considered.

2) The causes of Minamata disease are of manifold meanings; causative agent, medium, causative behavior, etc. The methylmercury compound, factory wastes, and contaminated fishes, all of them cause Minamata disease. As a phenomenon, the factory wastes killed people in the case of Minamata disease. The fishing people, who lived on the sea, have long suspected the factory wastes as the cause of the disease.

The theory, which was related to the subsequently offered hypothesis of toxic amine, showed that the family members of the fishing people suffered from Minamata disease because they had weakened or floating fishes. This is wrong and even intentional. It is unbelievable that the fishing people who have looked directly the dreadfulness of Minamata disease ventured to have eaten the apparently toxic fishes and shellfishes in large quantities. It is wrong to comprehend the cause of the disease as if the responsibility for the outbreak will be partly placed on the fishing people.

At the point of time when the suspicion of infectious disease was reduced and the factory wastes was suspected as the cause in November 1956, not only the self-control of fishery but also the assessment of measures to regulate the factory wastes should also have been needed.

3) In the case of Minamata disease, it took considerably much time for rigid specification of the causative agent, which included confirmation of causal relationship and dose-reaction relationship, etc. However, the cause was not so completely unclear as any countermeasure could not have been taken during the period. It has been revealed in the early stage after the outbreak that the fishes and shellfishes were the direct cause of the outbreak.

In the case of Minamata disease, little attention was given to the fishes and shellfishes, i.e., the first cause via the human mouth, because there was strength insisting the rigid specification of the cause. The affected people's lives and the cause should have been urgently inspected. It might be unnecessary to obtain detailed chemical formulae, but urgent countermeasures against the fishes and shellfishes as the cause should have been taken.

At the point of time when ingestion of the fishes and shellfishes in Minamata Bay was revealed to be the cause of the disease, the Government should have taken a measure to prohibit fishery without comparison of the compensation problem with damages to health, in consideration of severity of the damages. And, at the point of time when the factory wastes were suspected of having caused intoxication of the fishes and shellfishes, the Government has needed to conduct an on-the-spot inspection of the plant and to take measures to cease the drainage of toxic substances.

4) Once the situation has been evaluated to be urgent and to be treated by every possible means for the purpose of preventing the spread of damages on the basis of recognition of the fixed situation, various kinds of countermeasures should be considered. The evaluation is conducted by the Government, but at the same time, political decision also becomes necessary. The decision by the Government and political decision lacked decisively in the case of Minamata disease.

The field survey on Minamata was conducted considerably later by politicians including the Prefectural Governor, committees of the Diet, etc. Not only the mass media but also the Government is responsible for offering information to politicians, so that they can make appropriate political decisions.

(3) Lessons

1) Quick approach to the urgent situation affecting people's lives

It has no time for the cause to be confirmed in the urgent situation affecting people's lives. The person in a responsible post for solving problems must decide and conduct quickly, extensively, and

actively the ways to approach according to cases after he/she confirms the high probability of the cause. On this occasion, the problem with compensation, which accompanies the approach to the probable cause, is not taken into consideration. Administrative officials and politicians have the responsibility for the risks of the decision and implementation.

2) Collection of widespread information under the condition free from longitudinal relations within the same division or organization

On the basis of a viewpoint of inspection of the cause, widespread information must be corrected from various fields, while harmful influences of longitudinal relations within the same division or organization are avoided. In this case, the collection is not of the situation-approach type. Such information collection has a particularly important meaning in the early stage after the outbreak.

[*Comments*] In PRTR Law (regarding promotion of improvements in comprehension and management of the amounts of specified chemical substances drained to environment), collection of information from subjects of companies dealing with chemical substances is defined in Section 2 of Article 5 as follows: "The companies dealing with first-class specified chemical substances ought to report to the competent Minister the items defined by the Ministerial ordinance of the competent authorities concerning the amounts of the first-class specified chemical substances drained and transported in the previous fiscal year, which are grasped according to the regulations (shown in the previous section), every year by the first-class specified chemical substances and by companies according to the Ministerial ordinance of the competent authorities".

3) The active indication of information by companies and assignment of a duty of cooperation to companies

With regard to matters of damages to human health, it is essential for duties of active indication of information and cooperation to be assigned to the company that may be the source of pollution.

4) Cooperation in the actual setting of medical care and implementation of surveys in the districts of the outbreak

In the early stage after the outbreak, it is effective to secure the cooperation system involving the Government and medical participants, to reconsider patients' charts and inpatients, and to conduct epidemiological survey in the districts of the outbreak.

[*Discussion 3*]
What is the cause of discrimination against Minamata disease patients? What kind of approach will be taken to the cause?

(1) Circumstances

It is understandable that an infectious disease was suspected in the beginning after the outbreak, because many patients with similar symptoms have appeared during the specific period. The patients were isolated from the public as patients with infectious diseases, who are free of charge of medical expenses. The isolation was helpful for reducing financial pressure on the patients' family members.

As inspection of the cause progressed, it became increasingly clear among investigators in the early stage after the outbreak that the disease was not infectious disease. This fact did not infiltrate adequately into the

inhabitants' minds, and misunderstanding with infectious disease did not completely disappear. This provided a cause of discrimination against the patients.

(2) Discussion

A. Discrimination related to infectious diseases

In the Minamata district there was discrimination against Minamata disease patients and their family members. When considering the fact and the cause of the discrimination, the discrimination originating from the fear of the feature of a "kibyo (strange disease)" to be infectious can be indicated first.

In those days there were discrimination and prejudice against patients with infectious diseases, but it was a matter of the highest priority to isolate the patients because there was a high tendency toward social defense. The movement to correct the discrimination was therefore considered not to have been so active. In the case of Minamata disease as well, infectious disease was first suspected. Even though heavy metal poisoning was revealed to be the cause later, the suspicion did not disappear among the general people. Therefore, the Minamata disease patients are considered to have received discrimination related to infectious diseases.

B. The validity of the fact that infectious disease was suspected at the time of outbreak

It was extremely common sense to have suspected first an infectious disease for the massive outbreak of a "kibyo (strange disease)". Some doctors have thought that the disease is not an infectious disease in the early stage after the outbreak, but the patients were transported to the isolated wards for infectious diseases, thereby having reduced the financial burden to the distressed patients and the families.

C. Approach to the disease after it was revealed not to be infectious

During the period between 1957 and the former half of 1958, no patient was confirmed, partly because it was fully known to the inhabitants that Minamata disease might be the poisoning due to ingestion of fishes and shellfishes, and they avoided the ingestion. As another reason for the fact that no patient was observed during the period, it was difficult for patients with symptoms to have complained of them under the condition of the world.

For the inhabitants of the district, however, the hypothesis of heavy metal poisoning did not completely remove the fear of infectious diseases. At the point of time when the disease was revealed not to be infectious, this fact should have been declared openly and fully known to the local community. It is doubted, however, whether the prejudice against Minamata disease patients would have been removed only by ruling out the infectious disease hypothesis. For correct comprehension of the disease by the inhabitants, it is important to conduct activities of educational movements mainly involving the Government.

D. Discrimination derived from interests in the district

There are causes of the discrimination, other than infectious disease. It has been widely known that the symptoms were derived from poisoning through fishes and shellfishes. If the fishes or shellfishes had poor demands, the fishing people might be at a loss. Many citizens of Minamata, who have been dependent on Chisso, as well as the executive of Chisso and the workers had dislikes for the existence of the patients and the outbreak, because they were at a loss of cessation of the operation as a result of suspicion of the factory wastes as being the cause of the disease. Even now, the discrimination due to interests can become an issue.

The background factors of discrimination against the patients included the poverty of the people involved in small-sized fisheries, consciousness of discrimination against emigrants from Amakusa, etc., and common consciousness of discrimination against handicapped people. Green envy at the receipt of a present of money in token of the company's sympathy also occurred later, having promoted the discrimination.

E. The importance of removal of discrimination against the victims and of defense of human rights

1) How should the warrantable care for the victims be conducted? In th case as well, which excludes infectious diseases, it is necessary to consider a measure to guarantee the victims' livings in medical care by using public expenses for medical treatment until the causative party is determined.

2) Much instruction was drawn from Minamata disease as to the importance of removal of prejudice and discrimination against the patients and their family members and of the defense of the human rights in cooperation of the persons concerned in the fields of medical sciences, health and welfare, and education.

(3) Lessons

1) The role of the Government in preventing discrimination and persecution against the damaged inhabitants

For avoiding discrimination and persecution against the damaged inhabitants, the thorough conduction and prevalence of accurate information and education of human rights are essential. When the etiology of "kibyo (strange disease)" was revealed, the wrong impression about the feature to be infectious, hereditary influence, and the mechanism of the outbreak should have been removed, and activities of the Government to drive home accurate knowledge should have been needed.

3. Health screening

[*Discussion 4*]
How was health screening of the inhabitants in the contaminated district conducted in the process of inspection of the cause of Minamata disease?

(1) Circumstances

The survey conducted to detect patients in the beginning of the outbreak in Minamata district was one of the surveys on the situation of the outbreak by Minamata Strange Disease Countermeasures Commission of Minmata City organized when the outbreak of a strange disease was reported. The patients' charts were reconsidered at various medical care organizations, and the results were reported to the Prefectural Government in August 1956.

The Scientific Resaerch Group of the Ministry of Health and Welfare conducted epidemiological surveys at Minamata City and Akasaki in Tsunagi village in November 1956. In December 1956, the First Dept. of Internal Medicine and Depts. of Pediatrics and Public Health, Kumamoto University School of Medicine, as well as the city commission, made calls on patients at their houses in the district of the outbreak (Modo, Tsukinoura, Dezuki, and Yudo), and conducted Fukuro elementary and junior high school health examinations and epidemiological surveys.

Yoshikazu Matsushima (Leader) and others of the Kumamoto Prefectural Institute of Public Health conducted the examination of mercury level in hairs in all areas of Shiranui Sea for 3 years after November

1960. They examined in 2,726 cases during the 3-year period. The First Dept. of Internal Medicine, Kumamoto University School of Medicine, investigated symptoms in the inhabitants of the Goshonoura district by a questionnaire survey on the basis of results of the survey, but no medical examination was conducted

[*Comments*] Kumamoto Prefecture and Kagoshima Prefecture started conducting health screening in 1971. The subjects of the questionnaire survey were approximately 110,000 inhabitants, and approximately 23,000 of them underwent medical examination. About half of the subjects received secondary medical examination. In the same year, the secondary research group ["the Minamata disease study group 10 years hence" (Leader: Prof. Tadao Takeuchi)] was established in Kumamoto University School of Medicine, and a health screening was conducted on a large scale.

In Niigata, Niigata University started conducting health screening about signs, situation of the use of agricultural chemicals, and situation of ingestion of river fishes by the house-to-house investigation system in 2,813 inhabitants on the lower Agano in June, 1965, in cooperation with the Public Health Center. In the same month, mainly Niigata Prefecture, the cities, towns, and villages concerned, and the Public Health Center conducted health screening by the house-to-house investigation system in ca. 20,000 inhabitants, medical examination of the people with symptoms, and the determination of mercury level in hairs. Thus, effort to discover potential patients was made, and it was revealed that the patient started being observed in August 1964 and that 26 patients appeared, 5 of whom died.

(2) Discussion

A. Purpose of health screening

In epidemiology, a hypothesis regarding a regularoty factor for the occurrence of disease is inspected from the facts obtained from the results of health screening and clinical cases. A dose-reaction relationship is also inspected for the decision of causal relationship. There has also been the aspect of qualitative comprehension of the influence on health and the spread of damages (discovery of patients) in the health screening of inhabitants in the beginning of the study. The health screening for comprehension of the actual situation of damages is different from the epidemiological survey for inspection of the cause of damages in terms of the program.

B. Elucidation of diseases of unknown cause and inspection of the cause

1) The survey for elucidation of morbid features should also be early conducted on an adequate scale, because the true state of a disease becomes vague when various physical and social factors are added to the disease as the time passes.

2) The epidemiological survey of Minamata disease, which was conducted in the early stage after the outbreak mainly by the Dept. of Public Health, Kumamoto University School of Medicine, included investigation of the places of the patients, year, month, and season of the onsets, age, sex, and occupation of the patients, and abnormalities in animals. Valuable results were obtained.

The Kumamoto University Research Group was obliged to have concentrated its energy on research and study for inspection of the cause until July 1959 when the Group declared openly the hypothesis showing that organic mercury was the cause of the disease. Therefore, the Group could not afford to conduct wide-ranging and profound health screening for the inhabitants.

3) In the case of Niigata, findings of Minamata disease in Kumamoto accumulated and the causative

agent was also clear. Therefore, only the spread of the pollution could be dealt with as problem on the investigation, which was effectively conducted. In the case of Niigata as well, however, the investigation was not adequate in some aspects; the lessons obtained in Minamata were succeeded to the case of Niigata, but no investigation was conducted in the area of the middle reaches or up the Agano River, in which the suspected plant was located.

With regard to the clinical features of Minamata disease, the results obtained in Niigata could eventually be assessed in comparison with those obtained by the Kumamoto University Research Group.

C. Noncommittal implementation of health screening, etc.

1) The epidemiological survey on the spread of the damages and inspection of the cause, which has been conducted since the poisoning with waste water from the Chisso plant was suspected, was not adequate.

One possible reason why some problems with Minamata disease still remain unsolved is considered to be that no epidemiological controls could be collected, the range of health screening was restricted, the determination of hair mercury level was not continuous, and health screening was not thorough.

2) From midyear 1960 onward, the voice telling termination of the outbreak has dominated the public and even the research group. Since there have been no reports of new case from the district, the First Dept. of Internal Medicine, Kumamoto University School of Medicine has also described in the introduction of an article, "Minamata disease, which has struck terror into the inhabitants' hearts, also appears to have been stamped out because there have been no new case since 1961".

The Prefectural Government or the Government had no intention of conducting health screening of the inhabitants, which requires much expenses, time, and labors.

> [*Comments*] In 1969, the Director Hasuo Ito of Public Health Department of Kumamoto Prefecture (the ex-Director of Minamata Public Health Center) answered a question about the necessity of simultaneous medical examination of the inhabitants, which was offered at the Kumamoto Assembly, as follows: "In the beginning of the outbreak, the patients with symptoms were examined at a medical care institution of the district, and no potential patients could be detected on the epidemiological investigation by questionnaire about health, which was conducted by the Director of the Epidemiology Division of the Institute of Public Health, and others (in The Scientific Resaerch Group of the Ministry of Health and Welfare in November 1956). Even at present, the people with symptoms are being examined at medical practitioners of the district, who refer the patients to the Minamata Municipal Hospital, which is the best for medical examination of Minamata disease, and report suspected cases to the Board of Screening of Minamata Disease Patients. Since the door is thus opened for the examination, simultaneous medical examination is not necessary". However, even though the certification is applicable, it is not probable that health screening is unnecessary.

3) In Niigata, a house-to-house investigation was mainly conducted as an early survey. This method is highly evaluated in the sense of the detection of potential patients, and the data obained should be used as lessons in case of environmental pollution. The people, who showed high hair mercury levels, and those with symptoms were followed up after the house-to-house investigation in Niigata, and 41 patients have been observed by December 1969.

> [*Comments*] Thereafter, the second simultaneous medical examination was conducted in 11,904 people in 1970; the subjects consisted of the people, who answered to have had river fishes in large quantities on the first investigation, and MFCA members in the basin of the river. As the first step, symptoms were investigated by questionnaire (recovery rate, 92.5%). As the second step, 2,931 people were extracted from the subjects and medically examined in the district (the rate of the subjects examined, 72.1%). As the third step, close examination was conducted on 569 (73.1%) of the subjects at Niigata University, and 231 were eventually diagnosed as having Minamata disease.

The investigation in Niigata was exemplary. Even so, some of the people, who could not be detected on the investigation, were occasionally certified to have had the disease when they applied. This fact indicates that there is no perfect investigation of the influence of environmental pollution.

D. The role of the Government in health screening, etc.

1) The role of investigation as research activity of universities is different from that of investigation by the Government. Large-scaled health screening for meeting the social needs requires huge expenses and effort, and it must be tackled as the tasks confronting the Government and politics.

2) The survey for determining the range of damages must be early conducted on a large scale. When an abnormality is found, information should be opened to the person concerned and the society, and be practically used for the countermeasures.

3) The Kumamoto University Research Group made an effort singular in history to comprehend damages to health in the early stage after the outbreak. In those days, the survey including tens of thousands of subjects was needed when the districts of contamination and the control district were included, and the survey including everything was difficult.

It is impossible for one university alone to comprehend large-scale damages to health. The health screening after the decision of the cause of the disease may also be left to the causative party, but in the case of unknown causative party, the health screening must be conducted first on the Government's own responsibility.

In those days, the following way of thinking about survey of damages has not been widely adopted: large-scale and all-inclusive survey of damages from the aspect of public health should be performed. In fact, it may have been difficult for the Kumamoto Prefecture to conduct the survey on a large scale, but it has been possible even for the Prefectural Government to have conducted stepwise the survey by narrowing the district to be investigated. If the necessity of more widespread survey had been clarified from the results of the stepwise survey, the Government might have conducted the heath screening. Some clues to the subsequent solution of the problems may also have been provided from the survey.

4) Investigation of contamination and health screening after the decision of the causative person should be conducted at the causative person's expense. When the causative person does not bear any of them, the system, in which the Government forces the causative person to bear them by exercising the right to indemnity, should also be considered.

E. Investigation of hair mercury level

The investigation of hair mercury level conducted by the Kumamoto Prefectural Institute of Public Health for 3 years after November, 1960 was designed to pervent new patient of Minamata disease by determining fluctuations in hair mercury level in the inhabitants along the shore of the Shinanui Sea. The investigation was conduced with a conducement fund of Chiyoda Mutual Life Insurance Co. because of prefectural budgetary limitations.

The procedure for the determination of hair mercury excelled as an epidemiological survey. However, it is very regretful that the valuable data of the investigation of hair mercury level were not put to practical use for the detection of (mild) patients or the investigation of the spread of contamination. The determination should be conducted regularly even after the investigation, because it might have shown the course of the

subsequent mercury pollution. The results of the investigation of hair mercury should also have been used for the consultation and guide for the subsequent approach by reporting them to the subjects.

F. Follow-up study

Continuously observation of patients was not conducted in Minamata disease or Kanemi Yusho. When a follow-up study of patients was attempted, it was impossible because of moving of many patients, or no cooperation was obtained from any patient because of the absence of continuous observation.

<Column> *What is epidemiology?*

"Epidemiology" is a field of medical sciences, in which the frequency, period, and distribution of damages to health in human population are investigated, and the causes of the damages and various related factors are clarified from the data.

Epidemiology has originally been designed to clarify the causes of infectious diseases, but in recent years, non-infectious chronic diseases and cancers are also included in the subjects of epidemiology. There is recognition that the occurrence of disease is regulated by interactions of factors, i.e., cause (etiology), host (humans), and environment (opportunity of contact with etiological factors, habit, etc.).

Therefore, epidemiological methods are briefly composed of (1) comprehension of the actual situation of damages to health (description of the distribution of diseases), (2) assessment of related factors (formation of a hypothesis and demonstration of the hypothesis through case-control and factor-control studies), and (3) decision of causal relationship (confirmation by experiments). When demonstrating epidemiological causal relationship, correlations between estimated causal factors (biological etiology, physical etiology, chemical etiology, and mental etiology) and facts that are considered the results are revealed by observation of human population. The correlations are believed to meet the following 5 conditions: consistency, strength, specificity, temporal relationship, and rationality.

(3) Lessons

1) Decision of the implementation of health screening by the Government

It is necessary first for considering countermeasures to securely comprehend the spread of contamination and damages. To realize this, it is necessary to conduct widespread health screening of inhabitants without adherence to countermeasures against the public order or compensation. If the survey including everything is difficult, at least sampling survey should be conducted. A survey on the control group may also be requested for the determination of regional characteristics.

The Government should decide on its own responsibility in terms of the following: whether health screening should be conducted; if so, on what scale it should be conducted.

2) Implementation of early, widespread, and thorough health screening

Inspection of the cause of the disease is needed to establishment of effective countermeasures. In health screening designed to inspect the cause, it is important to conduct early, widespread, and thorough epidemiological survey regardless of expenses or man-power labor.

3) Importance of follow-up studies

Follow-up studies on health of inhabitants in widespread regions, which pay attention to the extent

of exposure to the pollution, are extremely effective for prevention of the subsequent spread of damages and for the appropriate treatment of problems.

4. Inspection of the cause

[*Discussion 5.*]
How were the investigators involved with inspection of the cause of Minamata disease?

(1) Circumstances

A. Effort to inspect the cause

No academical persons in the technology field were included in any research group like the Kumamoto University Research Group. Since the plant was also uncooperative for the research, understanding of the production process by the people of the plant was extremely inadequate.

The Dept. of Pathology, Kumamoto University School of Medicine asked Head Hasuo Ito of Minamata Public Health Center to conduct an experiment in the actual place.

In the study report by the Kumamoto University Research Group in November 1956, contamination of fishes and shellfishes with the factory wastes was already suspected as the cause of Minamata disease. The Department of Public Health, Kumamoto University School of Medicine initiated an experiment of the development of Minamata disease in cats. In the first half of 1957, Minamata disease was confirmed to be poisoning with the fishes and shellfishes caught in Minamata Bay as a result of the experiments using cats by Head Ito of the Public Health Center and Prof. Kansuke Sera of the Dept. of Forensic Medicine, Kumamoto University School of Medicine. In spite of the confirmation, it has taken long time for the causative agent to have been specified since then.

Director Hajime Hosokawa himself, who has reported the occurence of Minamata disease, started conducting experiments using cats in Chisso Hospital in May 1957. He initiated an experiment by directly adding the waste water collected in the processes of acetaldehyde production and vinyl chloride production, in which mercury was used, to the food for cats in July 1959. In October 6 of the year, the onset was observed in a cat numbered “400” (No. 400 cat) which was maintained with the food, to which the waste water in the process of acetaldehyde production was directly added. Hosokawa, however, avoided to declare the result openly with the intention of the executives of the technolody division of the plant.

The Kumamoto University Research Group presented the organic mercury hypothesis as to the causative agent for the disease in July 1959 on the basis of the patients’ symptoms and pathological findings and the fact that a large quantity of mercury was demonstrated from sludge of Minamata Bay. In 1962, Prof. Katsuro Irukayama extracted methylmercury chloride from the mercury sediment in the process of acetaldehyde production, and in 1965 Prof. Kitamura et al. succeeded experimentally in secondarily generating the methylmercury compound from the process of acetaldehyde production. In 1967, Prof.Keigai Sebe, Prof. Shoji Kitamura, and others confirmed the mechanism underlying reaction of secondary generation of the methylmercury compound from inorganic mercury in the process of acetaldehyde production. In the same year, Prof. Irukayama and his colleagues extracted the methylmercury compound from the wasted fluid of the rectifier in the process of acetaldehyde production in the Minamata plant.

Asst. Prof. Haruhiko Tokuomi, Prof. Tadao Takeuchi, and others presented the organic mercury hypothesis at the Japanese Society of Psychiatry and Neurology in April 1960, and Assis. Prof. Tokuomi received the society prize for the presentation. In September 1961, Drs. Takeuchi, Kitamura, Tokuomi, and Makio Uchida reported the achievements of study of Minamata disease at the 7th International Congress of

Neurology as well, which was held in Rome. Neurologists in foreign countries also knew that the cause of the disease was methylmercury poisoning.

[Comments] The Kumamoto University Research Group received the Asahi Prize in 1967, and Le Prix De L'institut De La Vie (the prize of the Life Research Institute of France) in 1977.

B. Counterarguments by companies

The causative company suppressed the office data on the experiments including the No. 400 cat experiment, which were disadvantageous to the company, and thereafter the experiments themselves were prohibited. Against the inspection of the cause mainly by Kumamoto University School of Medicine, the counterargument of only one company was changed to that of the Japan Chemical Industry Assocoation. Particularly the explosive hypothesis compounds and the toxic amine hypothesis, which involved the mass media via the central academic society and authorities of universities, confused public opinions about the cause of Minamata disease.

(2) Discussion

A. Minamata Strange Disease Countermeasures Commission of Minmata City

Immediately after the official detection of Minamata disease in May 1956, the Public Health Center, the medical association, the (Minamata) Municipal Hospital, Chisso Hospital, and Health Section of Minamata City cooperated to organize Minamata Strange Disease Countermeasures Commition in the district, and made effort to detect patients, admit them to hospitals, and investigate them. However, the cause was unclear, and they asked Kumamoto University School of Medicine for its help. At that time, 3 months or more have already passed, and according to some people, the help of a university in the district should have been asked much earlier.

B. Relationship between the Kumamoto University Research Group and investigators

1) The Study Group of Kumamoto University School of Medicine for the Strange Disease in MInamata (the Kumamoto University Research Group) was organized in August 1956, but there were no research funds for the fiscal year. The Group applied scientific research funds by the Ministry of Education in May 1957, but it could get only ¥680,000 as the research funds. Thus, the investigators of Minamata disease had a very hard time in studying the disease in the early stage after the outbreak under the postwar situation in which instruments for studies, drugs, information in the literature, research funds, and investigators were deficient. No definite opinion was established even among the investigators of the same university. Trials and errors were repeated in terms of investigation of the disease, and it took 3 years for the causative agent to have been revealed to be organic mercury.

It was a general tendency at that time, but information exchange among the departments in the Kumamoto University Research Group was not necessarily adequate; occasionally, some studies repeated, and information in the Chisso plant was unevenly distributed.

2) Prompt communication and information exchange among the fields of industrial hygiene, local health, etc. and among clinical medicine, basic medicine, pharmacology, technology, etc. are essential for early inspection of the cause. Interdisciplinary studies are necessary and important, but it was difficult to realize them under the situation of studies and research in those days. In actuality, no inspection of the cause from a viewpoint of industrial hygienics was conducted.

3) In the beginning of the establishment of the Kumamoto University Research Group, there was no proposal of cooperation from the Dept. of Technology. The Group did not actively ask any investigator of the Dept. of Physical Science or Technology for his/her cooperation. The reaction with mercury used in the process of acetaldehyde production is so well known by students of the Dept. of Technology and the Course of Chemistry of the Physical Science Dept. that it is described in the textbooks for high school students. If the investigators in the wide-ranging field of the science and engineering system had participated in the Group, more comprehensive approach might have been conducted. The Pharmacology Dept. or Technology Dept. of the Science and engineering system did not participate in the Group.

However, the participation of investigators of the technology system is a two-edged instrument; inspection of the cause mainly by medical scientists was conducted, who took their position as a third party against the causative company, when considering inspection of the cause in conformity with the situation in those days. That was why the organic mercury hypothesis was declared openly. In this respect, some people have considered that it was rather favorable for these investigators in the technology system not to have participated in the Research Group.

4) In contrast with this, some doctors of Chisso Hospital were residents of Kumamoto University School of Medicine. Therefore, Chisso is considered to have constantly comprehended the situation of research progress of the Kumamoto University Research Group.

C. Experiment with cats

The experiments using cats by Head Ito of the Public Health Center and Prof. Kansuke Sera are highly indicative in the point that they led to important results, i.e., the abnormality with the fishes and shellfishes in Minamata Bay even without any high-grade instrument. Despite the fact that important results useful for countermeasures were obtained, however, only self-control of ingestion of fishes and shellfishes was appealed to the people, and any strong measure to prohibit the ingestion was not taken in Minamata.

(3) Lessons

1) Implementation of interdisciplinary studies by presentation of information and cooperation system arrangement among investigators

Interdisciplinary studies are necessary for environmental problems. Presentation of information to investigators and cooperation system among the investigators are essential for making the studies successful.

2) Necessity of investigators' recognition of the relationship between technology and decision of policy

Technology shows two-sidedness. It is necessary for considering countermeasures to recognize it. On the other hand, the pursuit of scientific rigidity, which includes a causal relationship, and of perfection of technique for countermeasures was employed to defer the defense of contaminated people and the decision of policy. Investigators must also recognize this fact.

3) Rightful evaluation of the Government in terms of the studies for practical use in conformity with actual conditions of the district

As confirmed by the experiments using cats that the fishes and shellfishes in Minamata Bay are the cause of the disease, it is important for drawing a useful conclusion in deciding countermeasures to

make innovations in the method of study, which can be implemented without any expensive device of measurement or up-to-date technique and which is appropriate for the district's circumstances, and to put them to practical use. It is also necessary for the Government to rightfully evaluate the achievements obtained by these studies and to encourage them.

[*Discussion 6*]

What should be expected from the company as its social responsibility for inspection of the cause? How should the company approach to the environmental pollution?

How will acts to prevent environmental pollution be expected from companies and the business organization, which are involved with chemical industries?

(1) Circumstances

A. Acts of Chisso, Showa Denko, and the Japan Chemical Industry Assocoation

1) Chisso secretly changed the factory drainage channel to lead to the spread of damage. It requested the rigid demonstration of a causal relationship between Minamata disease and the factory wastes, and refuted stubbornly the achievements of study to the effect that the Chisso Minamata plant is the source of the occurrence of causative agent for Minamata disease. They did not declare openly the results of the No. 400 cat experiment performed in the plant, and further experiment was also stopped. Despite the fact that "Cyclator" is not useful for prevention of the spread of Minamata disease, its effect was exaggerated, leading to perplexed public opinion. Thereafter, methylmercury chloride was extracted from the wasted fluid in the process of acetaldehyde production in the Chisso, but the results of the experiment were not declared openly, either.

Chisso refused all on-the-spot inspections and requests for sample collection by outside investigators. Thus, Chisso had no attitude to cooperation.

2) Showa Denko insisted the agricultural chemicals hypothesis, and had a dispute with the research groups sponsored by the Ministry of Health and Welfare and Niigata University under the guidance of MITI. Since the differentiation of organic mercury used for an agricultural chemical (phenyl mercury used for paddy-rice plants) from methylmercury was not adequately understandable for the administrative authorities in those days, the hypothesis of agricultural chemicals insisted by Showa Denko perplexed the administrative authorities as well.

3) The Japan Chemical Industry Assocoation positively started out to settle the problem, Minamata disease, which has become a social issue, from the standpoint of business community. The Association established the Tamiya Committee by utilizing authoritative investigators and academic societies' authorities, and eventually delayed inspection of the cause.

B. Contents of counterarguments of companies and business community

The Japan Chemical Industry Assocoation offered a counterargument by raising the following points: (1) there have been no incidence of Minamata disease around other plants which possessed the process of acetaldehyde production; (2) assuming that the Chisso Minamata plant and the Showa Denko Kanose plant were the causes of the disease, why has not it occurred around other plants of the same kind? (3) The Chisso Minamata plant has started operation since the early time of Showa, and the Showa Denko Kanose plant has also started operation 12 years ago, but why were there incidences of Minamata disease dozens of

years after the start? (4) Why did not the disease occur before the outbreaks?

[*Comments*] It was impossible to explain the incidences observed from the latter half of the period between 1945 and 1954 onward in Minamata by the change in the acetaldehyde production volume. Emeritus Prof. Hajime Nishimura and his colleagues, the Faculty of Technology, University of Tokyo, elucidated the mechanism underlying the rapid increase in rate of secondary generation of the methylmercury compound by altering the promoter in 1951. The study was reported in "Gendai Kagaku"(Chemistry Today) (February and March issues, 1998) in 1998.

(2) Discussion

A. Penal responsibility and civil responsibility of companies

1) The companies, which damage the inhabitants' health with the chemical substances drained from the plants and lead them to death, should be taken to task for civil responsibility and penal responsibility.

With regard to penal responsibility for Minamata disease, the alteration of the drainage channei by Chisso became the conclusive factor for establishment of guilts of the Chisso's president and the chief of the plant, who were subsequently prosecuted for a criminal case (professional negligence accidental homicide). However, it is not true that only the alteration of the drainage channel is a problem. Even if a person's acts are socially useful transport business and medical care, he/she is taken to task for professional negligence accidental homicide in the case in which a man dies or receive damage by accident in the acts. If his/her intention is recognized, he/she is taken to task for homicide and injury as well. It is true in environmental pollution which damages human life and health with the chemical substances drained from plants. However, the people have only a superficial understanding of the fact. To let companies and the business organization do activities for preventing the victim from environmental pollution, the lodgment of crimes should be included in the judicial means.

2) With regard to civil responsibility for Minamata disease, Chisso and Showa Denko have been adjudged guilty of civil responsibility, but both companies neglected their duties to prevent the disease; they were uncooperative in inspection of the cause, and continued to offer counterarguments against the effort made outside to inspect the cause. During that period, the damage spread, and the civil responsibilities of both companies also became heavy. These acts indicate that causative company should not conceal the fact (that they are the causative companies) from public, but cooperate in early inspection of the cause and take preventive measures to counter damage.

3) Minamata disease in Kumamoto Prefecture was the first affair over the world, but the outbreak of Minamata disease in Niigata Prefecture was induced, despite that there has already been experience of Kumamoto Prefecture and that information and guidance for the disease have been offered by MITI. The responsibility of Showa Denko as the causative company is very serious.

4) Chemical plants will be taken to task for results, unless the safety of drainage is demonstrated by themselves on the basis of the way of thinking about the safety. In 1972, the laws of compensation for no-fault damage to health due to air pollution and water pollution were established, and the Environmental Pollution Crime Act was also established in 1970.

B. Approach of the business community

In the former half of the period between 1955 and 1964, when drainage from the Chisso plant was suspected of having caused Minamata disease in Kumamoto Prefecture and when the organic mercury

hypothesis was also declared openly, have other similar plants taken any countermeasures against the drainage? The Japan Chemical Industry Assocoation, which has made a desperate effort to deny the organic mercury hypothesis, did not appear to have accepted the situation seriously or to have received checking by the business community itself. The data collected on the drainage by the Association were not declared openly. On one hand, the Association refused an on-the-spot inspection. It is necessary for the companies to inspect what kind of approach they have taken for the plants possessing the same type of production process, as well as the guide offered from MITI to the business community from the time onward when the organic mercury hypothesis was offered.

C. Presentation of information

1) When a company causes environmental disruption, it becomes its most duty to relieve the victims and to positively present the data. The companies, which were suspected of having caused Minamata disease, should have gone all out to cooperate in inspection of the cause by offering not only information but samples and to present the internal data and results when they were suspected. However, Chisso did not present positively the internal data. Positive presentation of information is essential not only for the Supervision but also for the inhabitants.

2) It is impermissible that the production process is closed in spite of the presence of potential risk on the strength of enterprise secret. It is also an important point how the economically non-valuable chemical substances generated in the process are treated.

These companies also have the right to offer counterarguments, of course, but it should be established as social morals that concealment and falsification of the matters concerned about human health should not be allowed.

D. Inspection of a correlation between working environment and environmental pollution within the plant

1) The frequencies of troubles and workmen's accidents in Chisso were higher than those in other chemical factories of the same kind. If education of workers about the safety and sanitation in the actual setting had been thorough and if the company's attitude toward observation of the relationship between the occurrence of abnormality in the plant and environmental pollution had been complete, the approach of the company to inspection of the cause may also have been different from the actual approach.

2) The following way of thinking is important: "a causal relationship of environmental pollution is grasped from the data on vocational diseases, because working environment of the plant should have been contaminated before the observation of environmental pollution outside the plant". In the examples of Chisso, attention must be paid not only to drainage but also the risk in workers who clean sludge (dregs) in the rectifier.

> [*Comments*] Nobuko Iijima (environmental sociology) has summarized "A chronological table of environmental pollution, workmen's accidents, and vocational diseases" from such a viewpoint.

3) In the case of environmental pollution by factory drainage, which has influence on human health, the environmental administration and the administration for workmen's accidents and vocational diseases have to be consistently proceeded in cooperation with each other, because similar damages may have occurred in the workers as well in the plant as the source of pollution.

(3) Lessons

1) Recognition of penal and civil responsibilities for environmental problems and those with environmental pollution

Companies have responsibility as its social existence, and it is distinctly impermissible for them to regard only profit-making activities as supreme objective. It is also proper in any time that criminal acts or illegal acts, which may induce some risk to at least human life, should not be permitted. In environmental problems and those with environmental pollution, it is known that companies have responsibility to obey the regulations by the administrative laws and to compensate for damage. However, it should also be emphasized that some cases may be taken to task for penal responsibility. The Minamata disease affair was just a crime.

2) Liability of chemical factories for security of the safety

Chemical factories always have to confirm the safety by using the highest knowledge anad technology when they drain waste water. In case of doubt about the safety, the necessary maximum measures to prevent danger and injury, which include cessation of operation, have to be immediately considered. In chemical factories particularly, it is essential to confirm the safety of the secondarily generated materials, which are excluded from the economically valuable subjects.

3) Reconsideration of companies' close-to-the-vest method on the strength of protection of the Government

The prophylactic measures to counter environmental pollution and presentation of information will lead to companies' interests from a long-term viewpoint. The same administrative organization may control simultaneously checking of the companies in terms of environment and protective development of the companies. However, the system, which will avoid the companies' abusing the protection by the Government and refusing the presentation of information, should be established.

4) Inspection of a correlation of workmen's accidents and vocational diseases with environmental pollution

Industrial hygiene and education of the safety are also important. The correlation of workmen's accidents and vocational diseases with environmental pollution must be inspected.

[*Discussion 7*]
How was the role of the Government in inspection of the cause of the disease and how were relationships among the ministries and offices concerned? How was the role of the Prefectural Government in inspection of the cause?

(1) Circumstances

A. The Ministry of Health and Welfare

The Ministry of Health and Welfare was reported by the Kumamoto Prefectural Government about the disease in August 1956, and the Epidemic Prevention Section of the Public Health Bureau managed the problem. From 1957 onward, the problem was under the control by the Food Sanitation Section. The Scientific Resaerch Group of the Ministry of Health and Welfare was established in November 1956, and the

achievements of studies and the countermeasures were reported to the ministries and offices concerned and the autonomy concerned in 1957. In October 1959, the Ministry asked MITI to consider the most appropriate treatment of factory wastes in the current stage as soon as possible, and a report by The Food and Sanitation Investigation Committee of the Ministry of Health and Welfare was offered in November of the year.

The Environmental Pollution Section was esablished in 1964, and a basic survey was conducted on the factories using mercury all over the country in December 1965. The Ministry of Health and Welfare assisted publishment of a report entitled “Minamata disease--A study of organic mercury poisoning--”, into which achievements of past studies on Minamata disease were compiled by Kumamoto University School of Medicine, with trust money for investigation and research of environmental pollution in 1965. In 1966 the actual state of environmental pollution with mercury was conducted on three factories.

The opinion of the Ministry about Minamata disease was acknowledged at the cabinet meeting in September 1968.

B. Fisheries Agency

In November 1959, the Fisheries Agency requested of the Economic Planning Agency that Minamata Bay waters should be regarded as the specified waters based on the (Old) Water Quality Control Law and investigated as early as possible, because Minamata disease is considered attributable to fishes and shellfishes, which were probably infuenced by factory wastes, from many points.

At the same time, it has been clarified to MITI that harmful substances are almost organic mercury compounds. Therefore, as a part of the fundamental measures to solve the substances, the Fisheries Agency requested of MITI that the Ministry would pay a particular attention to appropriate countermeasures against factory wastes as quickly as possible.

C. MITI

MITI has constantly raised an objection against the organic mercury hypothesis; in November 1959 they offered a counterargument against the hypothesis at “the liaison conference of ministries concerning food poisoning in Minamata”. In this month, drainage survey was conducted on factories of production of acetaldehyde and vinyl chloride all over the country, but the results were not declared openly.

MITI offered a report to the Ministry of Health and Welfare and the Fisheries Agency, to the effect that the Ministry indicated Chisso to adequately cooperate with research groups in terms of abolition of the direct drainage channel to the Shiranui Sea from the Chisso plant, early completion of drainage disposal facilities, and surveys including inspection of the cause, although it is impossible to ascribe the cause to drainage from Chisso because a number of problems still remained unsolved on regarding harmful substances as the organic mercury compound.

D. Economic Planning Agency, MITI, Ministry of Health and Welfare, and Fisheries Agency

In Minamata Disease General Investigation and Research Liaison Council, each ministry had the following rights: Food sanitation and medical care were included in the right of the Ministry of Health and Welfare, fisheries in the Fisheries Agency, factories in MITI, and the entire evaluation in the Economic Planning Agency. The investigators who raised objections against the organic mercury hypothesis also participated in the council.

At the 1st conference of Minamata Disease General Investigation and Research Liaison Council held in January 1960, Prof. Raisaku Kiyoura presented questions about the organic mercury hypothesis. At the 2nd conference in April of the year, he presented “the toxic amine hypothesis”. The 4th conference was

held in March 1961, but thereafter, any conference of the council was not held. Prof. Katsuro Irukayama analyzed the methylmercury compound in the mercury sediment from the Chisso plant. With this opportunity, the Kumamoto University Research Group concluded that the methylmercury compound was the cause in 1963, but all ministries and offices neglected the conclusion.

Saikai National Fisheries Research Institute of the Fisheries Agency conducted mercury surveys of the fishes and shellfishes in the Shiranui Sea during the period from 1960 to 1961.

E. Kumamoto Prefecture

The activities of research study to inspect the cause of Minamata disease in Kumamoto Prefecture were proceeded by Minamata Strange Disease Countermeasures Commission of Minmata City in which Minamata Public Health Center participated. In August 1956, the Kumamoto Prefectural Government and the Commission asked to inspect the cause to Kumamoto University School of Medicine, and in March 1957, Liaison Committee of Countermeasures against the Minamata Strange Disease of Kumamoto Prefecture started to assess the countermeasures supported by the prefectural budget.

In April 1957, the Director of Minamata Public Health Center maintained cats with fishes of Minamata Bay at a room in the Center, and succeeded in inducing the onset.

The Kumamoto Fisheries Experiment Station reported the alteration of the drainage channel in June 1959. The Kumamoto Prefectural Institute of Public Health conducted surveys of mercury level in hairs during the 3-year period from November 1960.

F. Niigata Prefecture

The Niigata Prefectural Government and School of Medicine, Niigata University, established a research group, and the prefecture, city, and the Public Health Center conducted wide-ranging health screening of the inhabitants.

(2) Discussion

A. The Government

1) At the time of outbreaks of Minamata disease, the Environmental Pollution Act or the Environment Act has not been arranged. Even if a problem with the countermeasures taken by the Government was posed under these circumstances and the actual state in the past was justified as it was, no lessons will be generated. It is necessary to inspect the following points, for instance: what was the ideal public health government? Through what channel was information about outbreaks of the tragic affairs transferred and how was it connected to the Government's countermeasures?

2) Inspection of the cause of Minamata disease and prophylactic countermeasures against damages are just the reverse of each other. Under the relationship, MITI in the Government, which fundamentally had the role of industrial development and strong political power with support from the industrial world on the background, has taken the leading position, and continued to insist, from a standpoint of support of the plant, that the cause could not rigidly be specified. For this reason, the countermeasures taken in the Government were completely delayed, and no effective countermeasures were taken, leading to the spread of damages.

Of the four big affairs of environmental pollution, Minamata disease showed scientifically the most overt causal relationship, but it took long time for the government's collective view to be offered in 1968; it took 12 years since the disease was found for the first time in 1956, it took 9 years since 1959 when the Ministry of Health and Welfare offered the report by The Food and Sanitation Investigation Committee of the

Ministry of Health and Welfare, and it took 3 years since 1965 when the outbreak of the second Minamata disease was observed in Niigata. These results indicate that it was too late for the Government's decision to be made.

It is important to take countermeasures quickly and appropriately in the stage in which the possibility of a chemical substance inducing damage or the possibility of the company being the causative factor is not yet determined finally. On this occasion, who will judge to "determine" these points? What is the purpose? What kind of process will be used for the judgment? These points also become issues.

In Niigata Prefecture, the Government has heavy responsibility for the risk control, because it induced the outbreak of the second Minamata disease. No complete countermeasures against the outbreak and spread of damage of Minamata disease in Kumamoto Prefecture have been taken, resulting in the outbreak of the second Minamata disease.

3) It is not said that the Government's information has been displayed to the inhabitants in a series of process. When the countermeasures prove a disadvantage to economic interests of the industries, commerce, agriculture, and tourist business, counterpressure against the request for information presentation and countermeasures from the inhabitants and the nation is applied to the Government. To avoid the Government's bending to such pressure, it is important to constantly make clear the attitude to display information and to obtain their understanding by explaining to the inhabitants reasonable evidence including scientific technology, etc.

B. The Ministry of Health and Welfare

1) From 1956 onward, when the disease was officially found, the Ministry of Health and Welfare has led inspection of the cause, but as the cause has been narrowed down to the Chisso Minamata plant, the attitude of the Ministry of Health and Welfare seems to have become passive probably because of the pressure by the industrial field. The Ministry of Health and Welfare was confined to the range of food sanitation administration, despite that the Establishment Act defines maintenance of the nation's health. Immediately after the report by The Food and Sanitation Investigation Committee of the Ministry of Health and Welfare, the Ministry disorganized the special sectional committee of food poisoning, and relinquished its responsibility to elucidate the cause of Minamata disease.

In 1957, the Ministry of Health and Welfare did not approve the indication for the Food Sanitation Act to an inquiry by the Kumamoto Prefectural Government, but when the cause was mostly specified by presentation of the organic mercury hypothesis and a report by The Food and Sanitation Investigation Committee of the Ministry of Health and Welfare in 1959, there have been no evidences of the indication for the Food Sanitation Act having been discussed. The reason, "the cause is unknown" may have been an excuse made for the fact that no countermeasures have been taken. All acts of the Ministry have been passive.

According to a note of reminiscences written by Representative Kenshi Wanibuchi of the special sectional committee of food poisoning in Minamata, on November 12, 1959 (when a meeting of The Food and Sanitation Investigation Committee of the Ministry of Health and Welfare was held) the Chief of the Food Sanitation Section asked the Representative Kenshi Wanibuchi, who visited the Ministry of Health and Welfare, not to conclude that the cause of the toxic change of fishes is the factory drainage, while organic mercury is not yet detected in the factory wastes from Chisso. According to the note, Wanibuchi objected to the request, but at the conference on the day as well, the relation to the plant was not reported for the reason that organic mercury has not been detected from the factory wastes.

2) The Ministry of Health and Welfare showed no response to the report as well (organic mercury salt was detected from the mercury sediment in the process of acetaldehyde production of the Chisso Minamata

plant) offered by Prof. Katsuro Irukayama in 1963.

C. MITI

1) MITI, Light Metal Industries Bureau, which has had the strong power in the industrial world and the Government, protected the standpoint of the company, which insisted that rigid inspection of the cause is necessary for the certification of drainage from Chisso as the cause of Minamata disease. Therefore, official certification of victim of environmental pollution disease was delayed, resulting in a considerable delay of relief of patients. In 1959 the 1st-stage E-P conversion plan by MITI was almost completed. In December the 2nd-stage E-P conversion plan was determined at the departmental council, and Chisso was also planned to be included in the plan. After the study review by Kumamoto University was presented openly in the article written by Prof. Hirotsugu Shiraki, University of Tokyo, in January 1964, the Economic Planning Agency and MITI should have been taken to task for the country's nonperformance as the center of responsibility of Minamata Disease General Investigation and Research Liaison Council and as the ministry in charge of management of "the laws of regulations including factory wastes, etc.", respectively.

2) Why did MITI let Chisso construct the drainage disposal facilities without effect to remove organic mercury? The Fisheries Agency has requested to cease drainage of factory wastes and to approve on-the-spot inspections of factory wastes, and it is doubtful why the Fisheries Agency consented to the approach of MITI, which included mainly the establishment of such a drainage disposable facility. It is characteristic that the indication made by the Fisheries Agency from a standpoint of protection of marine resources was neglected. This fact is an expression of the attitude in those days, which shows that economic factors take priority over natural environment. The concrete approach made from a viewpoint of sea contamination was halfway.

D. Measures against the cause of the disease as the Government and cooperation of the ministries and offices

1) On inspecting the cause of Minamata disease and considering countermeasures against the disease, the Government has not fulfilled at all its responsibility to make a comprehensive decision. The approaches of each ministry and each office have been confined to the duties of the office based on the Supervision Act and the range of business matters, and the history of Minamata disease typified active and passive conflicts of attribution among the ministries and offices. The object of the Establishment Act by each ministry should be rigidly recognized. The way of the Government's measuring against Minamata disease was in a contrast with the case in Yokkaichi; to countermeasure against environmental pollution in Yokkaichi in 1963, both the Ministry of Health and Welfare and MITI cooperated in organization of "Kurokawa Investigation Team" to develop the subsequent comprehensive policy.

In fact, many investigators felt senses of emptiness against the way of approaching to Minamata disease in Niigata by cooperation among ministries and offices. For instance, research and investigation of organic mercury poisoning in the basin of the Agano River were conducted mainly by the Ministry of Health and Welfare according to the joint system of the wide-ranging ministries and offices concerned, which included MITI, Economic Planning Agency, Ministry of Agriculture, Forestry and Fisheries, and the STA, but the expenses for promotion and adjustment of special studies by scientific technology were cut off after the interim report in 1965. Under the circumstances, the studies left unfinished by the Ministry of Health and Welfare were respectively subjected to additional investigation with the research funds for each dept. of School of Medicine, Niigata University, and the final report was published.

2) Under the cabinet system, the Government is obliged to neglect the influence of the party in political

power on the administration, on making decisions. However, it still remains unclear who is taken to the task for what point, and how extent is the person taken to the task, as a public worker and as the administration concerning the results. Minamata Disease General Investigation and Research Liaison Council has played so only the slight role that there is no better alternative for the council having been told to have intended to disseminate the problem by widening the field of discussion. In this sense, the council is regarded as the outcome of unwise point. In the liaison council of ministries, consent is not obtained even when only one ministry objects to the opinion. At that time, the Economic Planning Agency had a responsibility for supervisory judgment, but a person who takes a strong leadership in the Government is needed to it. The system in which such a person is nominated by the cabinet is required.

It is important to bring about good understandings and make adjustment among ministries and offices, but if a mistake is made in nominating the lead agency on this occasion, the efforts of the ministries and offices, which are eager to inspect the cause, will be suppressed, leading to delayed inspection of the cause. The selection of lead agency is not merely an expression of disputes among ministries and offices, and it is necessary to clarify the person in charge of making a decision of the lead agency.

3) Conflicts of attribution among ministries and offices become big issues for the national government workers concerned, whereas attention should be paid to the point that the conflicts are not essential problems for the nation. The interests of the nation other than bureaucrats may be lost in the process of establishment of bills and policies by discussion and adjustment by the ministries and offices. This point should also be taken into consideration.

4) As a method of solving discord among the ministries and offices, power of the Government, which shows remarkable vertical relations and separation of ministries and offices, may be transferred to local communities, and a method of solving the discord is arranged in a unified manner under the heads of local autonomies.

E. Prefecture and city

1) To establish quickly and exactly the system of inspection of the cause, it is very important for the Government, the metropolis and districts, and municipalities to have the initiative and for local autonomies to actively measure themselves against the inspection. The decisions made by the directly elected heads are particularly important.

The roles of the following people and organizations are also particularly important: Investigators of universities and colleges, who are engaged in inspection of health damages due to environmental pollution with social and ecological background; public health centers as the nuclei of the local autonomies, environmental pollution and health institutes of the districts, etc.

On this occasion, it is necessary for activities of the inspection of the cause by organizing the inspection system according to the autonomy's initiative and for open presentation of the results to cultivate professionals of public health, environmental science, to distribute them to public health centers, health institutes of the districts, research institutes for environmental science, and to complete adequate apparatuses, and so on.

With regard to inspection of the cause of Minamata disease, the main role of the City Government may be a supporting activity in the actual place, which will include guide for investigators. The role of the City Government in relieving patients is important. Even so, the social welfare council of Minamata City has done no activity.

2) In the investigation in Niigata Prefecture, they went up to the Agano River, but the investigation ceased in the prefectural border. When environmental pollution and the spread of damages were investigated,

cooperation and adjustment may become necessary in the border of prefectures in some cases. In case of Minamata disease in Niigata Prefecture as well, adequate communication of Niigata Prefecture with Fukushima Prefecture up the river may have been necessary. With regard to communication of Kumamoto Prefecture with Kagoshima Prefecture, Minamata Public Health Center has early got in touch with the Izumi Public Health Center in Kagoshima Prefecture in order to detect and hospitalize patients.

(3) Lessons

1) Self-consciousness of rights and responsibilities of each of politicians, administrative officials, and investigators

Politicians, administrative officials, and investigators should be aware of their respective rights and responsibilities. Particularly, administrative officials must be aware of the meaning of guarantee of the status, and even if the countermeasures remain uncertain, the administrative officials must decide to practice the countermeasures.

2) Monitoring of the cross-sectional council of ministries and officials

The object and achievements of the establishment of organizations in the Government, which consisted of ministries and offices, must be monitored. In case of Minamata disease, Minamata Disease General Investigation and Research Liaison Council was used as a justification for nonperformance of countermeasures by each ministry or official. The roles of ministers as politicians are particularly important for the problems about which opinions of each ministry and office are divided.

3) Guarantee of research activities of investigators and judgment on the Government's responsibility

It is important for the Government to guarantee the investigators' activities to inspect the cause, to judge their opinions on the Government's own responsibility, and to conduct the measures to prevent damages.

4) The exercise of local autonomies through original ideas and innovations, which includes the use of the right of establishment of regulations

The roles of local autonomies of the actual place and research organizations in inspection of the cause are extremely important. The Government should not intervene them with the vertical administration and administrative power. The local autonomies adhering closely to the inhabitants should not mind only the intention of any governmental ministry or office. They must consider the measures to enhance welfare of the inhabitants on the basis of "the true aim of local self-government", even though they occasionally conflict with the Government's policy. As local autonomies have the right to establish regulations, they should carry out considerable activities through original ideas and innovations.

[*Discussion 8*]
How did the outbreak of Minamata disease in Niigata Prefecture influence on Minamata disease in Kumamoto?

(1) Circumstances

The 4th conference of Minamata Disease General Investigation and Research Liaison Council was held in March 1961, and since then, the activity has stopped. The Government offered a report to the Diet as "the activity is under investigation".

In August 1962, Prof. Katsuro Irukayama and his colleagues reported to a journal of an academic society that "methylmercury chloride was extracted from the mercury sediment in the process of production of acetaldehyde and acetic acid at the Chisso plant. On February 16, 1963, they reported the extraction of the causative agent at a briefing session of the PHS Research Team. After the extraction was reported on the mass media, the Kumamoto University Research Group presented on February 20 that the causative agent is concluded to be alkyl mercury. Furthermore, Prof. Irukayama et al. reported an article about the mechanism underlying the reaction of secondary generation of the methylmercury compound in June 1967. It was thus academically confirmed that Minamata disease in Kumamoto Prefecture was caused by the methylmercury compound secondarily generated in the process of production of acetaldehyde and acetic acid at the Chisso plant.

On the assessment of the budget by the Ministry of Health and Welfare in December 1964, trust money for investigation and research of environmental pollution, which was channeled into publishment of "Minamata Disease", which compiled achievements of studies by the Kumamoto University Research Group, was approved. It was published in March 1966. Basic surveys were conducted on the plants using mercury throughout the country in December 1965.

However, the outbreak of Minamata disease in Niigata was presented in June 1965. Some patients went to law against a company for damage suit in 1967. In January 1968, the plaintiff and lawers of the trial in Niigata visited Minamata to talk with Minamata Disease Patient's Families Mutual Aid Society and Citizens' Council for Minamata Disease Countermeasures, and presented a joint statement to the effect that "since the affair in Kumamoto is the same as that in Niigata, the Government should recognize the conclusion made by the scientists, solve the affairs, and carry out the relief of victims".

In August 1967, Prof. Irukayama and his colleagues presented detection of the methylmercury compound from the wasted fluid of a rectifier in the process of acetaldehyde production of the Minamata plant.

There were outbreak of asthma in Yokkaichi, and a plan to develop the Mishima-Numazu complex was withdrawn. Under the circumstances, an opinion about Itai-Itai disease was offered by the Ministry of Health and Welfare in May 1968, although the cause of Minamata disease remained scientifically uncertain at that time. This was the first decision made by the Government and politics. Thereafter, the nation's public opinion about environmental pollution began to change considerably along with presentation of environmental pollution in Yokkaichi and Itai-Itai disease environmental pollution to the court.

In September 1968, the Government presented the collective view announcing that Minamata disease in Kumamoto and organic mercury poisoning in Niigata were recognized as environmental pollution diseases (*Kogai-byo*) attributed to Chisso and Showa Denko, respectively.

(2) Discussion

A. Influence on inspection of the cause

With regard to the cause of Minamata disease in Kumamoto, inspection itself was proceeded from an independent standpoint, and it had no particular influence of the outbreak of Minamata disease in Niigata. However, with the opportunity of the outbreak of Minamata disease in Niigata, Minamata disease in Kumamoto also became reconsidered. Thus, the outbreak of Minamata disease in Niigata played the important role in political and social recognition of the cause of Minamata disease in Kumamoto.

B. *Influence on countermeasures*

1) The outbreak of Minamata disease in Niigata led to the second spotlight of problems with Minamata disease in Kumamoto from social and medical standpoints; outbreaks of the second Minamata disease triggered reconsideration of the first Minamata disease, Minamata disease in Kumamoto, from various aspects including Governmental policies, official definition of the cause, another look at the range of Minamata disease, and compensation. The victims in Niigata visited Minamata, and this gave a clue to starting a drive to consider the victims in Minamata.

Unless Minamata disease in Niigata had occurred as another tragedy, the affairs of Minamata disease in Kumamoto Prefecture might have been left frozen without having been dealt with again as the problems. They might have shown the circumstances different from the actual ones. The tragedy, Minamata disease, might have been left unsolved unless the second Minamata disease had occurred. In this sense, Minamata disease is a double-barreled tragedy.

2) With regard to the range of Minamata disease, Prof. Tadao Tsubaki and his colleagues of Niigata University reported, at the 63rd meeting of the Japanese Society for Internal Medicine in April 1966, that the incidence of symptoms in patients with Minamata disease in Niigata was different from that in Minamata disease in Kumamoto. Since then, a tendency to reconsider the conventional range of Minamata disease has been increased.

> [*Comments*] On establishing the (Old) Special Measure Act (1969) concerning the relief of damages to health due to environmental pollution, comparison of diagnostic criteria for Minamata disease in Kumamoto and those for Minamata disease in Niigata became needed.

3) With regard to the drive to consider the victims in Minamata, Minamata Disease Patient's Families Mutual Aid Society in Kumamoto presented to patients in Niigata (The Sociery for the Victims, etc.) a fund-raising campaign of ¥10,000 as a struggle support, with a letter showing "serious indignation to the imperfect administration of Showa Denko and the Government". With this opportunity, Minamata disease patients in Niigata visited Minamata, and issued a joint statement that "the Minamata disease affair in Kumamoto Prefecture is the same as that in Niigata Prefecture" in January 1968. Such interchange among the patients in Kumamoto anad Niigata had much influence on the subsequent development of the Minamata disease affairs.

4) Minamata disease in Niigata has been called the second Minamata disease, but Minamata Disease General Investigation and Research Liaison Council of the Economic Planning Agency, which has existed as a matter of form, has not drawn any conclusion to Minamata disease in Kumamoto. Therefore, the Government regarded the disease in Niigata as organic mercury poisoning in the basin of the Agano River, not Minamata disease. Thus, in one aspect, the Government will not recognize mistakes honestly because it sticks to the past circumstances.

However, Director Kiichi Miyazawa of the Economic Planning Agency in those days, who observed the political and social responses to the opinion of the Ministry of Health and Welfare about Itai-Itai disease and the subsequent results, approached the Minister Sunao Sonoda with a proposal to deal with Minamata disease by the Ministry. With this opportunity, the Government's opinion started to be decided.

(3) Lessons

1) Inspection of the cause and completeness of countermeasures

With regard to inspection of the cause of Minamata disease in Kumamoto, the cause had been

elucidated at the science level, while the Government officially recognized the disease of Minamata disease in Kumamoto and the damage of the cause because of outbreaks of the second Minamata disease in Niigata. This indicates that nothing could have been done unless "the second fault" had been made. Politics and the Government should not attend to the affairs with the attitude that countermeasures finish after their settlement as social problems. After all, it is more important to thoroughly elucidate the cause and establish countermeasures against the first affair and to prevent the recurrent outbreak.

5. Countermeasures

[*Discussion 9*]
What position did Chisso take in postwar chemical industries and industrial policies as well as the local community? How did the the position influence inspection of the cause?

(1) Background

In 1945. Nippon Nitrogen Fertilizer Co., Ltd. became the subject of dissolution of the big financial combines. The Nobeoka plant was divided and became independent as Asahi Chemical Industry Co., Ltd.. Some of the employees newly established Sekisui Chemical Co., Ltd. too. The entity of Nippon Nitrogen Fertilizer Co., Ltd. made a new start with the Minamata plant as the only plant.

Simultaneously with the war defeat, restitution of the Fertilizer Div. started in the Minamata plant, and in about 1950 the production scale was restored to the prewar scale. Improvement and reforms of the technology were serially conducted in the organic synthesis division of Chisso plant during the 10-year period from 1950. In 1952 manufactures of Octanol and DOP were made and engrossed the market. Even after the war, the company constructed the firm position as a general chemical industrial company.

During the period between 1955 and 1964, Japanese industrial policy mainly tended to strengthen the competitive position of chemical industry by conversion of raw materials from coal to petroleum. In the industrial policy, coal chemistry was also transferred to petrochemical industry by expanding coal chemisry before the conversion. Because of the policy, the demand of sodium hydroxide was markedly increased, and the importance of vinyl chloride industry as the way of secondarily generated chlorine to be used was also increased. Thus, Octanol production at Chisso rode the crest of a boom.

From 1960 onward after the settlement of the affairs with a contract with Chisso on the present of money in token of their sympathy, Chisso has not opposed openly the organic mercury hypothesis under the guide of MITI. The place of arguments was moved to the Tamiya Committee prepared by the Japan Chemical Industry Assocoation.

The Association allotted the expenses for the Tamiya Committee to the companies concerned; the volume allotted to Chisso was largest, followed by that allotted to Showa Denko.

(2) Discussion

A. Relationships among Chisso, the Japan Chemical Industry Assocoation, and MITI in postwar chemical industry and industrial policies

Industrial production of acetaldehyde by the water addition reaction was highest in Chisso all over the country; it was 45,244 tons in 1960, accounting for 40% of the domestic production. The Japan Chemical Industry Assocoation started out to deal with problems about Minamata disease on behalf of Chisso, probably because the Association was apprehensive about the spread of the organic mercury hypothesis, i.e.,

the hypothesis showing that the plant was the cause, not only to Chisso but also other domestic plants of the same kind. Chisso had been protected handsomely by the Government by arrangement of production in terms of the industrial policy. After the war defeat much attention was paid to production of fertilizers according to the priority production system. It can be said that Chisso outlived the postwar condition in confusion owing to the fertilizer production. Acetaldehyde had taken the extremely important position in the high growth policy centering on protection in the organic synthesis division of Chisso plant and heavy chemical industry. Under the circumstances, Chisso was positioned as the leading plant, and the role lasted until the business community was converted to petrochemical industry.

The importance of such a position of Chisso in the chemical industrial world and the Japanese industrial policy delayed decisively inspection of the cause. The company, the business community, and the Government, in which MITI took the initiative, denied the organic mercury hypothesis in one united body, and proceeded in cooperation with each other in order to prevent the spread to other plants of the same kind. Inspection of the cause was occasionally interfered with. It may safely be said that the connection of MITI, the Japan Chemical Industry Assocoation, and Chisso showed the “adhesive” relationships among politics, officials, and companies. This is the postwar system of Japan, and became the force of traction of the line of high growth.

In the middle of 1950s young technicians at that time felt strong affinities with chemical plants like Chisso, which proceeded unique industrialization on the basis of technology in Europe, because they felt resistance to the postwar technological introduction from the U.S. They resisted the conversion to petrochemical industry as well, and had a sort of technological nationalism; they were impatient for the fact that domestic technology had not been fully used. Some of the technical officials of MITI have also thought so in the Japanese industrial policy, and they have recognized that Chisso takes the lead in these chemical plants.

B. Minamata as the town of the government of Chisso

The town of the government of a company indicates a town formed by the preponderant dominance of a private company in a specific area and by the consciousness of the inhabitants who accept and support the dominance.

Chisso came into existence as a dominator of the town over the long period by exerting much influence on public finance, economy, and politics of the town.

The Chisso plant has been long and closely involved with Minamata City in terms of economical, political, and human relations since 1908. Minamata City did not ask Chisso to cease factory operation, partly because economic growth took priority over others in Japan after the war’s end particularly, even though the factory wastes were strongly suspected of having caused Minamata disease. Rather, the City Government moved with various organizations in the direction of cessation of drainage from the plant, which is led to cessation of the Chisso’s factory operation.

(3) Lessons

1) Radical reform of the attitude of business community to causative companies, which are pled for each other, and early prophylactic measures to counter outbreaks of the second Minamata disease.

Chisso, which has played the important role and taken the important position in chemical industry, has much influence on the entire world of chemical industry. Business community pleads for causative companies for fear that the affairs will spread other companies of the same kind. Ultimately, this proves a disadvantage to the entire business community. The Japan Chemical Industry Assocoation has never shown reflection about its negative role in the Minamata disease affair.

Early cooperation in inspection of the cause without pleading for mistakes and consideration of appropriate countermeasures against outbreaks of the second Minamata disease will lead to interests of the whole business community.

2) The function of local community to check companies

It is clear that the fate of the community depends on existence of specific companies. Even so, the community and the inhabitants will be damaged further considerably when the companies commit important mistakes. Local communities including autonomies also have to possess the function to adequately and quickly check activities of the companies without protection of the companies' mistakes.

[*Discussion 10*]
How about the change of the drainage channel by Chisso?

(1) Background

In September 1958, Chisso changed the drainage channel for the waste water in the process of acetaldehyde production, which had been flown into the Hyakken Seaport of Minamata Bay; the waste water was tentatively stored in the Hachiman Pool, then the supernatant fluid was drained to the mouth of the Minamata River.

In March 1959, it was revealed that the area of outbreaks of the disease spread from the mouth of the Minamata River, where there had been no patients, in the direction of Tsunagi.

MITI notified Chisso of putting the drainage channel back where it was in October 1959.

(2) Discussion

A. Change of the drainage channel is the crime adjudged guilty in the criminal trial

According to the criminal trial of Minamata disease (decision of the final appeal on February 29, 1988), in which the president of Chisso and the chief of the plant were adjudged guilty of a crime, the company and the plant neglected their duties to pay attention to the factory wastes and drained them to the mouth of the Minamata River by changing the drainage channel without consideration of appropriate countermeasure, despite the fact that they could recognize the involvement of a causative toxic substance in the factory wastes owing to the notification by the Ministry of Health and Welfare.

Chisso changed the drainage channel in spite of some people's oppositions within the division of Chisso. The change was not expected as a prophylactic countermeasure against environmental pollution. Rather, it was a means of concealing the cause as a temporary makeshift and showed a remarkable aspect of countermeasures against the fishing people. As a result, the change of the drainage channel should be regarded as the act equal to "living-body tests".

B. Countermeasures against possible affairs induced by the change of the drainage channel

Chisso had prepared nothing including the establishment of a monitoring system for the affairs that could be induced by the change of the channel. These affairs were not known at all to the Kumamoto Prefectural Government, Minamata City, or local resident. Such an important change of countermeasure should be explained to the organizations concerned as well as the local resident, so that they will satisfy of the

explanation, particularly in the situation in which the waste water was suspected of having caused the pollution.

Even if the area of outbreaks spread, Chisso did not take any countermeasure, whereas MITI, which had known the change of the drainage channel, responded to the results. The Kumamoto University Research Group was not adequately aware of the change of the channel until this time. Even after the association between the change of the channel and the area of outbreaks was recognized, the knowledge was not put to practical use for the measures to comprehend the spread of pollution and damages and to prevent the spread of damages.

(3) Lessons

1) Prophylactic countermeasures against environmental pollution with chemical substances, the first rule of which is suppression of drainage, not dilution or diffusion.

Dilution and diffusion of pollutants may be used as a method for draining, but the line between the dilution-diffusion and the spread of damages is very thin. On making some important changes, e.g., change of the channel, the subsequent monitoring on the company's own responsibility is essential for the changes. When environmental pollution due to accumulation of chemical substances is becoming an issue, it is necessary to decrease the amount of chemical substances drained to zero.

2) Morals of respect for human life in management of companies

Moral degeneracy of respect for human life in management of companies ultimately makes the companies to carry out the matters equal to a living-body test. Minamata disease is a typical example of the matters.

[*Discussion 11*]

What is the Chisso's intention of having set up the "Cyclator" and how were the acts of the maker of environmental pollution-preventing equipments set up? What is expected from the prophylactic countermeasures of companies against environmental pollution?

(1) Circumstances

In settlement of compensations for fishery between the MFCA and Chisso on August 6, 1959, a request for setting-up of drainage disposal facilities was offered. On September 23, Chisso started construction for setting-up of drainage disposal facilities including "Cyclator".

Chisso placed orders with a water management company for equipments for neutralizing wasted fluid and for separating solid sediments. None of the equipments was designed to remove the methylmercury compound, but Chisso advertised that the factory wastes became clean and safe because turbid waste water was cleared with the Cyclator.

On the other hand, the water management company, which designed the Cyclator, kept silence for foreign advertisement of Chisso, although the company knew that the Cyclator gave no guarantee to removal of mercury. A designer for the system of the company heard the performance of the president of Chisso at the ceremony, i.e., drinking of the post-management water at the ceremony on December 24. According to the subsequent statement by the designer, he/she thought that the performance would produce illusions in people's minds as if the system produced drinking water, and the designer was disgusted with the performance.

Thereafter, Chisso increased production of acetaldehyde and profits.

(2) Discussion

A. Objective of setting-up of the Cyclator

1) Chisso attempted to set up the Cyclator with much expenses. Its attempt aimed at countering the fishing people by clearing turbid waste water, of which fishing people complained and by draining to Minamata Bay, so that it would be nice to look at. MITI has also been asked by the Ministry of Health and Welfare to consider the most appropriate treatment for factory wastes as soon as possible. The Ministry had to find an answer to the request.

2) Setting-up of the Cyclator strongly advertised the safety of waste water, and it was not a reflection of Chisso that seriously measured itself against prevention of environmental pollution. In actuality, the Cyclator itself was not designed to remove organic mercury. Verbal evidence by the designer for the apparatus of the company that received the orders also indicated that Chisso and its president himself overtly deceived a number of citizens including the Kumamoto Prefectural Governor. Their attitude is very pernicious.

In those days, there was no marketable technique for removing organic mercury. According to one opinion, no countermeasures other than cessation of drainage of factory wastes or factory operation were considered for removal of organic mercury. There was a suspicion that the people who had the fishes and shellfishes contaminated by the factory wastes died or were affected. In this stage, circulation and recycling within the system, as Chisso conducted later, should have been adopted, or the wasted fluid should have been stored as a tentative measure until development of the processing technique.

3) As long as drain waste water is concerned, circulation and recycling allowed to avoid the exterior drainage. However, wastes accumulated in large quantities in the process of aldehyde production in those days, decreasing the performance. Therefore, activity of the promotor in the system was maintained by disposal of wasted fluid.

In actuality, the wasted fluid was drained at the time of disorder and checking of the apparatus as waste water as it was, and continued to contaminate the sea, even after the switch to the complete circulation system in June 1966.

B. Acts of the maker of environmental pollution-preventing apparatuses

The approach of the maker, which acquiesced in the Chisso's extravagant advertisement after completion of the Cyclator, eventually deceived many people concerned including the Prefectural Governor. In this respect as well, their approach is problematic.

C. Measures of companies to prevent environmental pollution

1) On introducing patented techniques of foreign countries to Japanese companies, how do they think about the mechanism of the production process and the merits/demerits? This has a very important meaning for developing countries. Information that is useful for considering countermeasures is obtained by preliminarily paying attention to environment risks.

2) In those days, Chisso was evaluated for the development of the independent techniques. On the other

hand, social ethics may have been deficient in industrialization of Chisso. The fishing people burst into the Chisso plant. The offices were also broken. If not properly handled, Chisso might have been driven into cessation of the factory operation. Thus, Chisso assigned excellent technical experts to inspection of the cause and countermeasures against environmental pollution. Chisso did not act without exterior regulations or pressure. If the data on Chisso's internal studies and on mercury had been offered from the beginning of inspection of the cause, the development of the affairs might have differed from the actual situation. A number of victims might have been avoided. The internal studies at Chisso appeared to have scattered and vanished because of fights for low wages. This fact reflects the limit of company's internal studies. Information presentation by companies is essential for environmental problems.

(3) Lessons

1) Responsibility of manufacturers and distributors of environmental pollution-preventing apparatuses for explanation of them

The manufacturers and distributors of environmental pollution-preventing apparatuses are responsible for constantly clarifying the safety and limit of their own products. When they acquiesce in extravagant advertisements by users of the products, it means that they conspire with the users' mistakes.

2) Presentation of information about the contents of companies' countermeasures against environmental pollution

Companies may commit a fraud upon the public without shame under the mask of the administration and specialists for the sake of pursuing their own interests. Company's fraudulent countermeasures ultimately lead to pressure of a lot of expense to them.

With regard to company's countermeasures against environmental pollution as well, presentation of accurate information is essential, and it is important for the information to be checked by specialists on the outside according to a system.

[*Discussion 12*]
What kind of countermeasures should the Kumamoto Prefectural Government and the Government have considered? How could these countermeasures have been realized?

(1) Circumstances

From the first of the outbreak of Minamata disease, there was a suspicion that the disease was caused by fishes and shellfishes.

The Kumamoto Prefectural Government could not specify the kinds of fish and shellfish or the extent of toxicity, but it strongly suspected that the fishes and shellfishes in Minamata Bay were the cause of Minamata disease.

In November 1956, Head Hasuo Ito of Minamata Public Health Center and others guided self-control of ingestion and fisheries of the fishes and shellfishes in Minamata Bay.

When the Kumamoto Prefectural Government referred to the Government about the application of the Food Sanitation Act in August 1957, it was answered in September of the year that the Act is not applicable. Therefore, the Prefectural Government only guided self-control of fishing and selling.

The contract of the victims with Chisso about a present of money in token of the company's sympathy

was signed on the basis of mediation by the Kumamoto Prefectural Governor and others in December 1959.

(2) Discussion

A. The exercise of the right to regulate

1) The Administrative Agency is in duty bound to notify prohibition of fishing and selling of all the fishes and shellfishes in Minamata Bay and waters around the Bay (on the basis of Paragraph 2 of Section 4 of the Food Sanitation Act) or to regulate drainage of the waste water containing mercury or the compound outside the plant against the Chisso Minamata plant [on the basis of the (old) law of regulation of factory wastes and so on]. The Administrative Agency should have used appropriate and opportune on-the-spot inspections concerning the outbreak of Minamata disease and prevention of the spread with evidence of the Food Sanitation Act, the Fisheries Act, the Fisheries Resources Protection Act, the (old) law of water quality preservation of waters for public use, and the (old) laws of regulation of factory wastes. The Administrative Agency has a legal responsibility for the fact that it neglected the duties, according to the following opinions:

- In August 1957, the Kumamoto Prefecture referred to the Ministry of Health and Welfare about the applicability of the Food Sanitation Act to the affairs in the prefecture. In July 1958, there was a notification from the Director of the Public Health Bureau of the Ministry of Health and Welfare. The spread of damages was induced by change of the drainage channel during the period from September 1958 to about September 1959. In July 1959, the Kumamoto University Research Group presented the organic mercury hypothesis. The Food and Sanitation Investigation Committee of the Ministry of Health and Welfare issued a report on the hypothesis in November 1959. Prof. Katsuro Irukayama and his colleagues extracted organic mercury from sludge over the period from 1962 to 1963. Under these circumstances, the right to regulate the factory wastes could have been issued at every time point. In other words, some countermeasures including prohibition of fishing should have been taken during the period between 1957 to 1959, because it was almost revealed during the period from 1957 to 1958 that the noxious fishes and shellfishes caused the disease, and in 1959 it has been clear that the methylmercury compound accumulating in the fishes and shellfishes caused the disease and the drainage source was the Chisso Minamata plant. Furthermore, the fact that the cause has not been rigidly specified has been regarded as the reason why the right to regulate has not been exercised. However, even after Prof. Irukayama et al., reported specification of the cause, the Government has not acted eventually. Some people have criticized the Government for not having intended to take any countermeasure.

- The Ministry of Health and Welfare, which denied the application of the Food Sanitation Act to the affairs in 1957 because of the absence of evidence of the fishes and shellfishes' having become noxious, has not monitored continuously the fishes or shellfishes since then. When the report by The Food and Sanitation Investigation Committee of the Ministry of Health and Welfare was issued in November 1959 as well, there was no trace of assessment of the application of the Food Sanitation Act to the affairs. The occurences were still observed in those days. Despite the fact that "assaulters could have been punished, simultaneously with prevention of the spread of damages, by the exercise of various disciplinary rules, if the Government had had a mind to do so" in the situation (Verdict at a hearing of intermediate appeal in the Kawamoto trial: Verdict at the Tokyo High Courts in June 1977. Decision.), no effective countermeasures were taken. It is incomprehensible.

- In April 1957, Head Ito of the Public Health Center demonstrated in experiments using cats that Minamata disease was caused by ingestion of the fishes and shellfishes in Minamata Bay. Therefore, the

Prefectural Government should have prohibited fishing in the Bay in order to prevent the spread of damages.

- The prefectural rules for fishery adjustment (Paragraph 32) decided by the Fisheries Resources Protection Act include the rule of ordering companies to establish facilities for removal of harmfulness. Therefore, the Government might have been able to apply the Fisheries Resources Protection Act to the affairs at that time.

[*Comments*] The Government and the Prefectural Government insisted in the trial concerning the application of the Fisheries Resources Protection Act as follows: there is no legal evidence of such right to regulate; in the situation at that time when the causative agent for Minamata disease has not been clarified either, the countermeasures centering on the administrative guide were taken as much as possible; therefore, the Government or the Prefectural Government has no responsibility for any national compensation for the outbreaks of Minamata disease or prevention of the spread.

2) The problems with the root of the way that legal responsibilities of the Government and the Prefectural Government for the administration based on these laws and regulations are currently being contested at law. However, the following facts must be honestly reflected as the way that the administration should be: it took long time for the cause of Minamata disease to have been decided and for adequate guide to have been given to the companies, having led to outbreaks of such serious and misery damages. Moreover, on thinking about countermeasures against problems with environmental pollution by the administration in the future, these facts should be considered as rigid lessons from viewpoints of the exercise of the rights of public workers to regulate, prevention of the spread of damages, policy decision with much attention paid to health and life, quick and precise approach, and presentation of information.

<Column> *The laws of countermeasures against Minamata disease*

The Food Sanitation Act, which is designed to prevent the development of sanitary injuries due to food and drink and to secure the safety of public health, regulates business managers. The Act in those days has also regulated to prohibit selling of food products, which contain toxins or toxic substances and to which these substances adhere, and collection, production, processing, and cooking for selling of these food products (Paragraph 4). In Paragraph 22, it was regulated that administrative countermeasures against the business managers, who contravene the rules, were considered as follows: the business managers are ordered to abolish food products or to suspend business.

The Fisheries Act is designed to develop fishery production capacity by making fishing people and fishing industrial workers to organize unions and by rationalizing the utilization of water surface. In Paragraph 65 of the Act, it is defined that the competent Minister and prefectural governors can establish Ministerial ordinances and rules to restrict and prohibit “catch or collection” and treatment of aquatic animals and plants and selling for the purpose of controlling and adjusting fisheries. The Fisheries Resources Protection Act is designed to develop fisheries by promoting protection and cultivation of fisheries resources. In Paragraph 4 of the Act, it is defined that Ministerial ordinances and rules can be established as in Paragraph 65 of the Fisheries Act. On the basis of the regulations of these two Acts, the rules of the fishery adjustment in Kumamoto Prefecture have been established in Kumamoto Prefecture as well for the purpose of adjusting fisheries by protecting reproduction of aquatic animals and plants by controlling fisheries. The rules include mainly permission of fisheries and restrictions of prohibition and method of fishing during a fixed period in a fixed area. It was also regulated that permission may be cancelled when the Governor approves of the beneficial necessity, and that the substances, which are harmful for protection of reproduction of aquatic animals and plants and which may be abandoned and leak, are prohibited to be left and the persons, who act

contrary to the rules, are ordered to take measures to remove them.

"The laws of water quality preservation of waters for public use" (The Water Quality Control Law) and "the laws of regulation of factory wastes, etc." (The Factory Wastes Law) were regarded as the laws called "Two-step Water Quality Act", which was designed to prevent water pollution, until establishment of the Water Pollution Prevention Act". According to the Act, the Director of the Economic Planning Agency specified the waters by the Water Quality Control Law, which had problems with water pollution, and established the criteria for water quality of the waste water drained to waters of individual area, then the Cabinet decided the facilities indicated for regulations and the competent Minister with Cabinet order by the Factory Wastes Law in order to maintain the criteria for water quality of the specified waters. The competent Minister had to regulate drainage from the facilities originating request.

It is rigidly ventilated in the history of the affairs whether these laws could have been utilized as the evidence of administrative measures to prevent the spread of Minamata disease, which include prohibition of fishing in the vicinity of Minamata Bay, prohibition of selling of the fishes and shellfishes, cessation of the factory operation, and improvement in the facilities for waste water.

B. Attitudes of the Government and politics to the outbreaks of Minamata disease

1) In the beginning of the outbreak of Minamata disease, the spread of damages should have been prevented by the following means, regardless of the causative agent in the factory wastes or the mechanism underlying the generation of a causative agent: fishing should have been prohibited on the basis of the results of experiments using cats by Head Ito of the Public Health Center; the causative plant should have been let take countermeasures by declaring openly a suspicion that the disease was caused by factory wastes.

At the early time when waste water from the Chisso Minamata plant was suspected, the Kumamoto Prefectural Government or the Ministry of Health and Welfare should have requested an answer by referring to Chisso with official documents. If so, Chisso, which accepted the reference, might have been obliged to answer. With the opportunity of the answer to the reference, Chisso might have investigated by itself, and might not have been able to subsequently avoid its responsibility.

2) How do the politics and administration approach to the situation developing in the actual setting? Various innovations will be required, but the inhabitants' health is most important, and it is fundamental to protect environment from being disrupted.

The appearance of new patient due to change of the drainage channel, presentation of a report by The Food and Sanitation Investigation Committee of the Ministry of Health and Welfare, and speech of the T-I Minister Ikeda at the Cabinet should have triggered new performance of general survey of the plant itself by the organization centering on the Ministry of Health and Welfare, MITI, the Fisheries Agency, and the Economic Planning Agency with the aim at evaluating the source of generation of the causative factor for the disease. Such a survey was not conducted, though. By contrast, a survey by the Kurokawa Investigation Team on governmental consignment (Ministry of Health and Welfare and MITI) started from November 1963 in Yokkaichi, and basic comprehensive countermeasures were initiated on the recommendation of the Team.

With regard to the Minamata disease affair, there has been no trace of active countermeasure by the politics or the administration. Rather, some brakes were applied to inspection of the cause within the administrative division, leading to the spread of damages. The political intention to solve the problem early was not observed in the Governmental setting-up or administration of Minamata Disease General Investigation and Research Liaison Council. The liaison council became the means of prolongation of definition of the cause and of evasion of responsibility of each ministry.

All the process of assessment including the contents of a liaison committee of each ministry should be

opened for the progression of countermeasures against environmental pollution and public health. It is also important to select the place of presentation of the process; ministers should express it at press conference after the Cabinet, and ministers as politicians should conduct the presentation at places, so that it will be dealt with on the mass media.

C. The roles of local autonomies

1) The Kumamoto Prefecture, which was involved with mediation of the contract of the victims with Chisso about a present of money in token of the company's sympathy, has intended to mediate fishery disputes and to control the Minamata disease affair as a disorderly affair.

Thereafter, in the verdict about the first suit for Minamata disease at the Kumamoto District Court, it was due to approve that the contract of the victims with Chisso about a present of money in token of the company's sympathy acted contrary to Paragraph 90 of the Civil Law Act, i.e., public order and morals. However, the contents of the mediation, with which the Prefectural Government had also been involved, had the following problems: even though the waste water from Chisso was the causative factor, there was an article of relinquishment on the victims' right to demand reparatious payment; the amount of present of money in token of the company's sympathy was small; and so on.

2) In centralization of power from the Meiji era onward, there were also excellent points such as insurance system, education system, etc., but environmental pollution, which converged at industrial provincial cities, reflect harmful influences of centralization of power.

National indications had to be asked for the exercise of the right to regulate, which was the institutional trust' business. This point thereafter weakened the consciousness of the people concerned in Kumamoto Prefecture on solving problems with Minamata disease, and proved a disadvantage to appropriate approaches. For appropriate decision of district's problems in the district, decentralization of power including the environmental administration must be strongly promoted in the future.

In those days, inspection of the cause of Minamata disease in Kumamoto progressed to some extent, because there were Head Ito of the Public Health Center and the Kumamoto University Research Group as the reliable main investigator and the organization in the district.

The achievements made in the aspect of administrative countermeasures included construction of the exclusive ward for Minamata disease patients and rehabilitation center of the Minamata Municipal Hospital.

(3) Lessons

1) The starting point of the approach of the Government and the Prefectural Government to outbreaks of Minamata disease is a decision to avoid the repetition of the tragedy of Minamata disease and their concrete acts.

The Government did not take any countermeasure that could have been taken at end point of each affair, having resulted in the spread of damages. The Government and the Prefectural Government should decide not to repeat such tragedy without forgetting the process of their faults. The decision and their concrete acts become the starting point of their environmental countermeasures in the future.

2) Responsibility for the explanation of the measures to prevent the spread of damages

In order to prevent the spread of damages, the Government and the Prefectural Government should decide policies paying attention to health and life and consider quick and appropriate

countermeasures by utilizing maximally the rules, which are applicable to each occasion, and they should present necessary information. They should fulfill their responsibility for explaining the reason why they take a certain countermeasure and that why they do not take the countermeasure to the nation. If the legal right to prevent the spread of damages is inadequate, the Diet should quickly conduct new legislation.

3) "Lesson" from the actual place and hearing of the opinions of the people concerned including critics

It is important first for not only the administrative person-in-charge of the actual place but also the governmental person-in-charge to walk and look at the actual place. After listening well to the patients, the families, and critics including NGO, a fair evaluation should be made so that the nation understand it well.

4) Promotion of decentralization

For early and appropriate solution of local problems with environment and health, decentralization must be promoted by making the local autonomies of the district to have the competence.

6. Decision of policies

[*Discussion 13*]
How was the priority order of policies and values?

(1) Circumstances

On conducting Japan's postwar rehabilitation, the Government took the priority production system by paying attention to fertilizers and coal. Immediately after World War II, reactivation of the fertilizers division started in the Minamata plant, and the postwar production scale was restored to the prewar scale in about 1950.

Since about 1955, technical innovations consisting mainly of heavy chemical industrialization and renewals of facilities have been politically promoted, and high economic growth at an annual rate of about 10% was achieved. Japan strived for economic growth by the joint efforts of government and people with enforcement of Japanese competitive position in the world for a national guide.

Chisso succeeded in induction and synthesis of Octanol from acetaldehyde in 1952, then products of a plastic material essential for molding of vinyl chloride, DOP, were also manufactured. They soon had a monopoly position in the market, and sustained increased production upon increased production, along with increased production of acetaldehyde as the raw material.

MITI prepared "countermeasures against cultivation of petrochemical industry" for the benefit of Japanese economic independence and enforcement of the Japanese competitive position in the world in 1955.

In 1958 there was a confused fight between fishing people and the plant in terms of fishery damages of factory wastes of Honshu Paper Co., Ltd. in Edogawa. The Tokyo Metropolitan Government ordered the company to stop the operation tentatively, but in case of Chisso, the Ministry did not guide the company to stop the operation.

In November 1959, the Minamata Municipal Assembly adopted a resolution act containing the company's request for the avoidance of cessation of operation, since cessation of Chisso's operation leads to the extremely important result. Representatives including Minamata Mayor, the Municipal Assembly, the

Chamber of Commerce and Industry, the Agricultural Cooperative Association, and the labor union appealed to the Governor.

The Basic Act of Countermeasures against Environmental Pollution was established on July 21, 1967. According to the Act, health protection was considered to have a first priority. The subjects of the articles harmonious with economy was excluded also in the protection of living environment by arrangement of the concrete laws concerning countermeasures against environmental pollution in 1970.

(2) Discussion

A. Evaluation of background of the era

1) Since the time of outbreaks of Minamata disease was the era when economic growth was given the highest priority, there was only slight concern about environmental problems. There were loud cries for economic growth and increased outcome all over the country.

Moreover, the Japanese people tend to think generally that some damages are the victims necessary for the great benefit of the majority of the nation. The tendency may be a cause of outbreaks and the spread of Minamata disease. The Japanese postwar rehabilitation is believed to have been successful by the catch-up system. However, when considering the presence of Minamata disease, it cannot be said that the Japanese postwar rehabilitation was successful. It is necessary to reflect on the fact that the postwar high growth of the Japanese society could be achieved only at a considerable sacrifice in Minamata. Thinking about problems with Minamata disease means that the postwar society and the ideal way of the politics and the administration themselves are reconsidered.

2) In the centralized system of politics, economy, and society, no particular attention was paid to any district, and a viewpoint of districts as sources of labor supply and locations of factories was dominant over all the others. Minamata disease occurred in Kumamoto Prefecture far from Tokyo, particularly in Minamata at the southern extremity of the prefecture. The situation has had much influence on the course of the Minamata disease affair. When considering the course of the Edogawa plant of Honshu Paper Co., Ltd., the Minamata disease affair might have developed in a manner quite different from that of the actual affair, if the disease had occurred in Tokyo Bay.

B. Consideration of environment and human life in corporate activity

1) On establishing policy and evaluating corporate activity while conflicting economic interests are adjusted, all circumstances of the interests will be taken into consideration by the usual administrative means for the purpose of selecting the interests in balance.

However, when health and life conflict with economic interests, no appropriate solution is ultimately observed, except for the case in which health and human life take priority over everything. The corporate activity inducing damages to health should be strictly regulated, and the information should also be presented.

2) The mechanisms underlying control or management of chemical substances with uncertain safety are needed, and PRTR is one of the examples of the legal system concerning them.

With regard to countermeasures against chemical substances with uncertain safety, how should the balance with economic activity be considered? At present, the way of balancing itself has changed, and “Environment report”, “Environmental finance”, “ISO14000 Series (Environmental management system)”, and so on have been estabished as the mechanisms underlying the facilitation of independent countermeasures of business companies. These mechanisms should not be designed to conceal corporate

information, and should be combined with presentation of information.

[*Comments*] "Environment report" is designed to comprehensively present the independent countermeasures of business companies to reduce the extent of influence of corporate activity on environment and reduce the influence. The report is occasionally called an environmental act plan, environmental statement, and environmental action plan. The concrete descriptions contained environmental management system including management policy, the goal and plan, organization system for environmental problems, and the situation of approach to the ISO14001 standard. Other contents were the measures to reduce CO2 drainage, waste matters, and environmental burdens (recycling, etc.).

"Environmental finance" provides means and tools of determining how environmental preservation activity of business companies is being conducted and how it is efficient. The report is one of the efficient procedures for increasing corporate activity of companies and the environmental efficiency (the concept of the burdens to environment, which accompany goods and production of service).

"ISO14000 Series" is the standard of environmental management system (in which policy and goal concerning environment are established and managed) produced by a private international organization, International Standardize Organization (ISO) by the request of "The United Nations' Conference on Environment and Development (Earth Summit)" held in 1992. In Japan, the Japan Industrial Standard (JIS) corresponding to the ISO14000 Series has been issued.

3) With regard to the chemical substances drained, which may have influence on human health, the extent of the risk must be evaluated as the guideline for policy decision.

On this occasion, such corporate activity that neglects the safety, as observed in the Minamata disease affair, is not admitted. As of the end of 1956, 17 of 54 Minamata disease patients died in Minamata, showing the very serious situation. When the Government is confronted with such a serious situation, it must reconsider promptly the extent of the risk and be flexible for considering countermeasures.

At present when endocrine-disturbing chemical substances (environmental hormones) and so on are becoming issues, the course of the Minamata disease affair is very suggestive. In this sense, the outbreak of fetal Minamata disease indicates something symbolic.

4) The possibility of an accident occurring while dealing with dangerous substances still remains, as observed in the accident of explosion at a plant of agricultural chemicals in Bopal, India in 1984. It will need a viewpoint as to how the events that have occurred in the past in Japan are profited for the purpose of preventing accidents and injuries.

C. The restoration of health from damages and compensations for damages

The restoration of health from damages and compensations for damages should be conducted by the causative party, companies. A system, in which the causative company bear both expenses for contamination test and health screening, should also be considered. When the causative company goes down, however, the victims will not be able to receive compensations for damages. In the event of lack of funds for the restoration of health from damages and for compensations for damages in individual causative company, another system, in which compensations to fixed extent can be conducted within the range according to the rules showing burdens to causative companies, is also required.

It will take long time with much effort for the restoration of the entire local community from damages. Relief of the victims' health from damages may be inadequate according not only to the present system of rights but also to the administrative system.

(4) Lessons

1) The Japan's responsibility of presenting the policy for economic development, over which human life and health have priority and which does not induce environmental pollution

In the Governmental policy for economic development, things are polluted first, then they are cleaned, so to speak. The policy has induced irreparable results in our experience. The tragedy of Minamata disease was repeated twice in Japan. This fact is a symbolic affair indicating that a policy, in which human life and health have priority over economic development, is needed. It is also the Japan's responsibility to show a policy for economic development, which will not induce such tragedy, to developing countries.

2) ***Decision of policies taking the values of environment into much consideration***

On deciding the Governmental policy, it should not be allowed for the economic value to have priority over others without any restriction. The value of environment must be taken into much consideration. In the era when economic development is a matter of the highest priority, however, the industrial party may frequently criticizes that insistence on consideration of environment is in exclusive support of environment. To counter the criticism, the increase in public opinion and social pressure including concerted action by the residents are needed.

3) ***Inclusion of prophylactic countermeasures on the basis of evaluation of the risk of chemical substances***

With regard to chemical substances and so on, which may have influence on human health, a system, in which the risk is preliminarily evaluated and countermeasures according to characteristics and stage of the risk are decided and conducted, is needed to the Government and companies. The evaluation of risk must be constantly reconsidered according to the subsequent surveys and studies.

[*Discussion 14*]
How was the relationship between politics/administration and scientists? How were the roles of politics/administration and scientists? How were social obligations and ethics of scientists (particularly those who study environmental pollution)?

(1) Circumstances

In May 1956, Minamata Strange Disease Countermeasures Commission of Minmata City was established, being composed of the Public Health Center, the Medical Association, the (Minamata) Municipal Hospital, Chisso Hospital, and Health Section of Minamata City. In August of the year, Health Dept. of Kumamoto Prefecture reported the outbreaks of Minamata disease to the Epidemic Prevention Section, the Public Health Bureau of the Ministry of Health and Welfare. In the same month, the Minamata Rare Disease Research Group of Kumamoto University School of Medicine (the Kumamoto University Research Group) was organized. The Ministry of Health and Welfare organized The Scientific Resaerch Group of the Ministry of Health and Welfare for Minamata Disease in November. The Director of the Epidemiology Division of the Institute of Public Health and others conducted epidemiological field surveys.

In January 1959, a Special Task Group on Minamata Food Poisoning started in The Food and Sanitation Investigation Committee of the Ministry of Health and Welfare, Ministry of Health and Welfare.

In August 1959, Prof. Raisaku Kiyoura, the Tokyo Institute of Technology investigated seawater of Minamata Bay, and stated at a press conference as follows: "Seawater of Minamata Bay is not so seriously

contaminated with mercury. The mercury hypothesis should be carefully declared openly".

On November 10, 1959, MITI guided Chisso to complete drainage disposal facilities and to inspect the cause in cooperation with the organizations concerned as soon as possible. The Ministry asked the domestic plants of acetaldehyde and vinyl chloride production to investigate drainage. On November 11, the Ministry distributed the Kiyoura's report at "the liaison conference of ministries concerning food poisoning in Minamata". On November 12, a joint committee of The Food and Sanitation Investigation Committee of the Ministry of Health and Welfare reported that "the main cause of Minamata disease is a certain type of organic mercury compound", then the sectional committee of food poisoning in Minamata was disorganized. The source of the generation was not described.

In February 1960, Minamata Disease General Investigation and Research Liaison Council (that was composed of the Supervision of the Economic Planning Agency, MITI, the Ministry of Health and Welfare, Fisheries Agency, and investigators) hold the first conference.

In November 1966, Prof. Tetsuzo Kitagawa of Dept. of Technology, Yokohama National University presented "the salt-water wedge" hypothesis as follows: the agricultural chemicals at the wharf of the Shinano River were flown out by the earthquake and the tidal wave in Niigata and flew backward from the mouth of the Agano River to contaminate the area on the lower Agano. Showa Denko consistently supported the hypothesis of agricultural chemicals.

In May 1968, a uniform view of Itai-Itai disease was offered by the Ministry of Health and Welfare as a result of political decision, and in September of the year, an official view of Minamata disease was presented by the Government.

(2) Discussion

A. Relationships between scientists' opinions and the administrative judgment

1) In the beginning of outbreaks of Minamata disease, the administration and investigators struggled to inspect the cause together in Minamata City. The activities of Minamata Strange Disease Countermeasures Commission of Minmata City of the actual locate and the efforts of the Kumamoto University Research Group and the Study Team of the School of Medicine, Niigata University to inspect the cause of the disease have been highly evaluated.

As the cause was narrowed down, however, to the Chisso Minamata plant and Showa Denko Kanose plant, neither Chisso nor Showa Denko approved the conclusions made by these investigators. Furthermore, the administration, particularly MITI, has played the role as a breakwater for Chisso. In the meantime, some investigators advocated the theories, which were different from the previous one and which were advantageous to companies, having given wrong impression to public opinion.

2) From 1960 onward, Minamata disease in Kumamoto has been socially settled down, but the scientific studies were continued. However, the report by Prof. Katsuro Irukayama and the article, i.e., an outline, on Minamata disease, which was reported in a general scientific journal, "Kagaku (Science)", by Prof. Hirotsugu Shiraki of the University of Tokyo School of Medicine, were not so dealt with in any academic meeting or the mass media. Neither the Ministry of Health and Welfare nor Minamata Disease General Investigation and Research Liaison Council responded to this fact. For this reason, the presentation of the Governmental official view was delayed, and the relief of patients on the basis of the judgment as having Minamata disease was also delayed.

3) With regard to administrative tasks in which scientific findings become issues, the administration must judge appropriately scientists' discussion and consensus. For the evaluation of policies by the administration by standing aloof from a dispute over a point of sciences, the ability to understand the dispute

is needed to the administrative inside. However, when the administration evaluates that solution of problems is being delayed in the situation in which an unproductive dispute over a point of sciences continues endlessly, the administration must demand the political decision by showing possible choices and the consequences and lose no time in deciding policies.

B. The administration's support and duty to research studies

1) Research studies need expenses. The administration should not make universities/colleges or investigators to raise funds for research studies, but secure and distribute the budget for research studies necessary for inspection of the cause and for comprehension of the actual conditions of damages and contamination in the first stage of research study. On commissioning researches to scientists, eligibility and clearness must be secured for the researches via the evaluation and decision by committees and commissions on the outside. A system in which achievements of researches are put to practical use for decision of the administrative policies should be established.

With regard to studies on environmental pollution, there are some studies that are not designed to inspect the cause. They are obliged to be regarded as delaying and confusing the inspection. On distributing the budget for researches, the objective of researches of environmental pollution must be clarified.

2) In Japan, attention is paid to the diseases that become usual main causes of death, e.g., stroke and cancers, in medicine, but only little interest is taken in toxicology. Governmental support is needed to toxicology for a long time.

C. Standpoints and roles of investigators

1) What should be the ideal stand of investigators and scientists, who are involved with problems about environmental pollution and environment? All the investigators have freedom to study as respective scholars and to have their own opinions, but, as a rule, they have responsibilities for their opinions, and present the achievements of studies to academic and technical journals with proofreading system.

There is another problem; when achievements of studies and experiments of some scientists and investigators are reduced to society, and social reactions to the achievements occur, it becomes an issue to which extent they should personally bear the social responsibility for the reactions. However, the problem must be considered separately from the relation to the administration.

2) In the Minamata disease affair, the statements of the investigators involved with companies and business community had constant much influence on the public at some periods; they interfered with inspection of the cause in one case and justified the nonperformance of countermeasures in the other case. Thus, none of the statements were put to practical use for the relief of or countermeasure against the victims.

It is particularly necessary for elimination of interference with the pursuit of truth to clarify the process of the fact that the "investigators" supporting the counterarguments offered by the Chisso plant and the Japan Chemical Industry Assocoation, which can be regarded as "a shadow of organization" in the process of inspection of the cause, delayed inspection of the cause with position in the academic society and abundant funds for researches in the background.

3) It is very regrettable that there is a difference in social evaluation between a central organization and an organization in the district in the field of study research as well. Kumamoto University was written in a journal "Mizu (Water)" as "wretched university" or "ekiben daigaku (station-lunch university)". Young investigators of the university were infuriated at the statement, but many investigators neglected such a noise, and the investigating staff members engaged in inspection of the cause did not result in confusion, either.

(3) Lessons

1) Science as a tool for the administrative decision

Science is only an instrument to decide respective acts for the persons interested other than scientists, who include the administration. In the event of social problems particularly, which are involved with life and property, the administration must understand this situation of science, and decide on the administration's responsibility even under the scientifically uncertain situation as well.

2) Self-knowledge of science that can become one tool for protection of the causative company

All scientists should recognize that science becomes a weapon for protection of the causative company. The scientists, who investigate environmental pollution, particularly must be aware of the objective standpoint as a scientist and of the engagement in the work involved with the inhabitants' lives and property. In environmental pollution, it is constantly asked that for whom and for what the studies are conducted. This must be kept in their minds.

3) Discernment of scientists for the justice without adherence to the existing academic theory or authorities

There is the fact that academical sectionalism and authorities dominate the field of science as well. If a scientist acts counter to the authorities, he/she may receive restrictions in the aspect of funds. However, the existence of scientist, who does not adhere to any existing academic or administrative authority, is important. In the administration as well, it is necessary to discern the scientist's justice without adherence to the existing academic theory or authority.

4) Scientific researches depending on the actual settings of the occurences of damages

Scientists, particularly the investigators of environmental pollution, must depend on the actual settings of the occurences of damages

[*Discussion 15*]
How about the roles of the mass media?

(1) Circumstances

It was reported in the issue as of August 1, 1954 of Kumamoto Nichinichi Shimbun (The Kumamoto Daily News) that "cats were totally destroyed by epilepsy, and people are ready to cry for help against the remarkable increase in the number of rats".

The disease was adopted for the first time to the issue as of May 8, 1956 of The Nishinippon as follows: "A strange infectious disease in Minamata which induced the dead and mad men".

The problems with Minamata disease went into headlines for the first time in Tokyo in a news item of "fishing people riot" in November 1959.

At the time of the contract about the present of money in token of the company's sympathy, metropolitan the mass media published the counterarguments against the organic mercury hypothesis with heavy headlines, having led to loss of the confidence of the representatives for the patients, who had been

encouraged by the organic mercury hypothesis established by Kumamoto University and had proceeded negotiations on compensations.

The local paper "*Minamata Taimusu* (Minamata Times)" had accurately reported the situatiions of the patients and the circumstances of inside of Chisso.

Since 1959 when the problem with Minamata disease was settled by the contract about the present of money in token of the company's sympathy, the number of reports on the problem by the mass media has decreased.

In the latter half of the period from 1955 to 1964, the mass media reported the hypothesis different from the organic mercury hypothesis, which was presented in the Tamiya Committee, without any revision, having played the social role in showing an erroneous impression that there may be various theories about the cause.

Kumamoto Nichinichi Shimbun (The Kumamoto Daily News) scooped its rivals with a report on the hypothesis by Prof. Katsuro Irukayama and his colleagues (at the meeting of study report on supportive funds for PHS by the NIH) as "Organization during the process of production".

(2) Discussion

A. The role which the the mass media should play in the Minamata disease affair

1) In the beginning of the outbreaks of Minamata disease, even the mass media had no recognition about environmental pollution disease; they pursued only the phenomena occurring in front of them, and just reported.

However, the force of the mass media is important for motivating people to countermeasures. The mass media played the constant role in informing of the presence of Minamata disease in the early stage of the outbreaks of the disease and of the process of inspection of the cause, but they should have offered warnings to the seriousness of the affair by interpreting facts and phenomena and conducting an investigational report in a special program. The mass media might have played the role in more rigidly criticizing the administration, politics, and companies.

2) The mass media have the considerable force to excite and make up public opinion. They should be conscious of this respect, distinguish facts from the truth, judge the correct contents, and pose necessary social problems by themselves without missing opportunity. As the readers' responses particularly, the number of people who consider the events reported to be "true" will increase if the quentity of information reported is large, and the number of people who concern will decrease if the quantity of information is small or unless information is reported. Much attention should also be paid to these points.

Moreover, the countermeasures of the mass media against the problem about Minamata disease have, as a whole, been poor until 1968 when the governmental unified view was issued, since 1960 when the possibility of settlement of the problem was tentatively offered. The presentation of the article by Prof. Irukayama in an academic journal in 1962 and the scientific article by Prof. Hirotsugu Shiraki in 1964, for instance, were hardly dealt with by the mass media, regardless of their scientific importance. From 1960 onward, the problem about Minamata disease has been poorly adopted by particularly national newspapers.

In those days, television did not spread, and there was the first report on the occurrence of a "kibyo (strange disease)" by the mass media. This report may have excited apprehension in the wide-ranging inhabitants. The riot of fishing people was further published with heavy headlines as a problem with sensationalism of news, showing that the mass media also played a part of the role in forming an impression as the affair disturbing the public peace and order.

B. The practical use of other communications media

Communications media including INTERNET will increase in the future, but the mass media via printing and reflections are still important communications media.

Furthermore, the literary works by Michiko Ishimure, the photographs taken by Sisei Kuwabara and Yudin Smith, and films by Noriaki Tsuchimoto and his group, all of which were conducted on their own individual responsibilities, played the important role in reporting the truth of Minamata disease and appealing the seriousness of the affairs.

(3) Lessons

1) Significance of the news based on continuous investigation

Items of news by the mass media have much influence. The mass media need the news based on investigation as well as continuous and investigational work, not fragmental news or those based on vain sensationalism.

[*Discussion 16*]
How did the police and the public prosecutors office function?

(1) Circumstances

On November 2, 1959, the Kumamoto Prefectural Alliance of Fishing Cooperatives proposed to Chisso a collective bargaining for cessation of operation. Since Chisso refused its proposal, the fishing people broke into the plant. A collision took place between them and the police, and there were 100 or more wounded. In January 1960, the Prefectural Police Station arrested 35 fishing people including the president of the MFCA in Tanoura, Ashikita-gun.

At the time of the contract about the present of money in token of the company's sympathy in 1959, no lawyers supported the patients.

In February 1963 when Kumamoto Nichinichi Shimbun (The Kumamoto Daily News) contained an article on the presentation of confirmation of organic mercury in the plant by Prof. Katsuro Irukayama, a chief public prosecutor of the Kumamoto District Public Prosecutors Office gave the following comment: "We have not touched about this problem, because no distinct cause has been known, but we must be much concerned about it if some conclusions were drawn." However, there were no concrete movements of the prosecution.

(2) Discussion

A. Trends in the environmental pollution affairs; the victims tend to be indicted for the affairs and the assaulters tend to be taken to no task for the affairs.

1) In the affair of intrusion of fishing people, the fishing people who were agitated were arrested. Certainly, acts of violence should be avoided in every case, but the affair began to assume serious proportions because the company did not comply with the fishing people's request. In the Minamata disease affair, the fishing people as the victims received indictment first of all, and they were convicted of the affair. On the other hand, Chisso was not taken to task for the affair.

2) The police and the public prosecutors office consistently regard the Minamata disease affair, which

includes the affair of protest by the fishing people of the districts along the shore of the Shiranui Sea, as "problems of the public order", and no acts were conducted from the standpoint of prevention of the spread of victims. The police or the public prosecutors office did not act, probably because they may have been conscious that the causative problem was unsolved. It is also considered that they may have failed to see all the conditions in the large range of a crime of environmental pollution.

Such an attitude was criticized in the verdict of the Tokyo High Court as well in the Kawamoto trial as independent negotiation in June 1977. In the primary verdict of the third suit in Kumamoto in March 1987, it was judged that the Chisso Minamata plant, which had continued to drain the untreated waste water, could have been strictly controlled to increase effectiveness of the regulations on the basis of the laws and regulations of performance of police's duties in about November 1959. Thus, the nonperformance of the Kumamoto Police Station was doubted by the judgment.

B. The suppressive effect of investigation on the spread of damages and timing of investigation of Chisso

1) In the affairs such as the Minamata disease affair, the administration also should consider actively judicial means includng criminal indictment, and so on.

With regard to the police and the public prosecutors office as well, the police should have entered the plant by the exercise of its right to investigate, when the source of pollution was narrowed down, collected evidence of the process of production and waste water management, and investigated the executives of the plant for the purpose of avoiding the spread of the damages.

There were two occasions as timing of the initiation of investigation of Chisso; i.e., in 1959 when new patients were induced by the change in the drainage channel and in 1962 when the source of pollution was traced by Prof. Irukayama et al. In February 1963, a chief public prosecutor of the Kumamoto District Public Prosecutors Office gave the comment, "We have not touched about this problem, but we must be much concerned about it if some conclusions were drawn". On this occasion, however, there were no movements of the prosecution.

One possible reason for the nonperformance by the police or the public prosecutors office in 1962 is considered to be that Minamata disease has been socially believed to have ceased in 1960. This wrong belief proved a disadvantage to progression of the subsequent countermeasures. If enforced investigation had been conducted on this time point or at the time earlier, the spread of the damages of Minamata disease should have been prevented and the situation of the Minamata disease affair should have been very different from the real situation. However, it is also important another viewpoint to think about efficient methods other than criminal indictment for the purpose of preventing the spread.

In actuality, the public prosecutors office indicted the executives of Chisso in 1976, i.e., 20 years after the disease was officially found. Furthermore, the patients' complaint triggered the indictment. They indicted the ex-president of Chisso and the ex-chief of the plant, but the indictment had no suppressive effect on crime any more, because it was too late.

2) There was no continuous monitoring system for Minamata disease from 1960 onward. If it had been present, the report by Prof. Irukayama might have been dealt with in a manner different from that in the real situation in 1963, and if investigation had been conducted at that time, outbreaks of the second Minamata disease could have been minimized.

3) The administration should have decided while conducting stepwise countermeasures along with inspection of the cause, but it was unclear under the legal system in those days where the responsibility lies. Thus, the administration was locked up within the competence of the laws concerned.

(3) Lessons

1) The exercise of the right to actively investigate affairs of environmental polluton and environment

The roles of the police and the public prosecutors office are to investigate and expose crimes, and the roles function just after occurence of affairs and events. In the problem with environment, however, their investigation and exposure may get too late unless their roles are active, because the wrong acts are frequently continuous.

2) The practical use of criminal indictment just for the causative person for environmental pollution

Criminal indictment is conducted strictly on the victims as the countermeasures against the public peace and order, but what is really necessary for the countermeasures is the more strict attitude toward the causative person for environmental pollution.

3) The function of criminal indictment to prevent the spread of damages of environmental pollution

When deciding something, the administration must be fully resolved to be ready to do criminal indictment in case of need.

4) Systematization of public suits

A system, in which the Administrative Agency can sue companies for something (public suits), is also needed.

[*Discussion 17*]
How did the patients act?

(1) Circumstances

On August 1, 1957, Minamata disease patients organized the Benefit Society for Victims of a Rare Disease in Minamata (President: Eizo Watanabe; Later, Minamata Disease Patient's Families Mutual Aid Society) for the sake of cooperation in inspection of the cause of the strange disease and of the relief of the patients. Since nobody supported the patients or the families, who were placed in a fix, in those days, they were completely isolated in the local community.

On November 25, 1959, Minamata Disease Patient's Families Mutual Aid Society demanded that Chisso pay two hundred and thirty-four million yen to 78 victims as compensations, and started staging a sit-down demonstration in front of the main gate of the Minamata plant on November 28. They made a representation to the Kumamoto Prefectural Governor to ask for conciliation of mediation by the Shiranui Sea Fishery Dispute Mediation Committee. On December 12, the Committee (Chairman: the Prefectural Governor) started out to mediate the dispute concerning the demand.

On December 25, the negotiation between the Kumamoto Prefectural Alliance of Fishing Cooperatives and Chisso was settled, and Minamata Disease Patient's Families Mutual Aid Society also signed to the contract about the present of money in token of the company's sympathy on December 30.

The victims in Niigata Prefecture went to law against Showa Denko for damages in June 1967. This was the first suit of the four big suits at law for environmental pollution in Japan.

In January 1968, the plaintiffs and the lawyers of the trial of Minamata disease in Niigata visited Minamata City, and talked with Minamata Disease Patient's Families Mutual Aid Society and Citizens'

Council for Minamata Disease Countermeasures. As a result, they presented the joint statement about the relief of the patients.

(2) Discussion

A. Progression of solution of the problem with Minamata disease owing to movements by the victims

With regard to Minamata disease in both Kumamoto and Niigata, the compensation or countermeasure has not progressed until movements by the victims occurred. Likewise, the compensation for fisheries has not progressed until movements by the victims occurred.

Consequently, the amount of payment was suppressed to be inadequate, and the cause of the disease also remained unclear. This problem with the contract about the present of money in token of the company's sympathy provided an important clue in the new development of the Minamata disease affair by complaints from patients after the representation of the Governmental unified view.

B. Recognition of the actual state by communications with patients

General citizens and the labor union showed the protective attitude to movements by the patients for Chisso. Under these conditions, Citizens' Council for Minamata Disease Countermeasures was organized to support mentally and physically the patients and the families. The actual state became known for the first time by the communications with patients.

(3) Lessons

1) Progression of the solution induced by the victims' own movements

The victims' own risings of negotiations and acts yield the force to open the closed situation. The administration and investigators must listen to the victims' voices sincerely. This becomes the first step to solving the problem.

Even though the administration settles the affair by isolating the victims in conspiracy with the company, the problem will not be solved at all.

2) Necessary and essential support to the victims as the social weak

For the complaints from the victims as the social weak to be enlightened in society, supportive activities of wide-ranging citizens including investigators and jurists are necessary and essential.

[*Discussion 18*]
How did the local residents approach to the problem?

(1) Circumstances

Soon after the riot of fishing people on November 2, 1959, the Mayor and representatives of the Municipal Assembly, the Chamber of Commerce and Industry, the Agricultural Cooperative, the Labor Union, etc. presented a resolution by the Minamata Municipal Assembly to the Governor on November 7, which proposed that "early inspection of the cause of Minamata disease, denial of violent acts, countermeasures against the relief of patients and fishing people, and early completion of drainage disposal

facilities by Chisso". In the resolution, they asked to avoid cessation of Chisso's operation.
Kateikai, Suikosha, the New Nippon Nitrogen Minamata Plant Consumers' Cooperative presented a written petition for the denial of violent acts and an objection to cessation of drainage of the factory wastes to the Prefectural Governor and the President of PFF as of November 9, 1959.

In January 1968, Citizens' Council for Minamata Disease Countermeasures (President: Ms. Fumiko Hiyoshi; Later renamed, Citizens' Conference for Minamata Disease) was organized for the purpose of supporting Minamata disease patients.

In June 1968, the Minamata Ashikita Branch presented, "The request to the Minamata disease struggle branch" to a teachers' union conference. In August of the year, all Japan Prefectural and Municipal Workers' Union (AJPMWU) Headquarters in Kumamoto Prefecture presented "a resolution for supporting the struggle against Minamata disease" in the 17th National Regular Congress.

(2) Discussion

A. The theory showing that the cause of the disease is considered to be Chisso by intuition of the local residents

The inhabitants of Minamata, who were the victims and, simultaneously, the first "persons who discovered the disease", have perceived by intuition that the plant is the cause. A system for absorbing the honest voices of inhabitants is needed.

B. Citizens' acts in the town governed economically by the company

How did the citizens and NGO behave in Minamata?

In the beginning, general citizens were fear of infectious diseases, and avoided the patients with a strange disease as much as possible. However, soon later when there was a rumor that waste water from Chisso was considered to be the cause, they protected Chisso, and the tendency toward cold treatment of the patients gradually spread. When the contract about the present of money in token of the company's sympathy was established in December 1959, the trend toward green envy and contempt increased. Until Citizens' Council for Minamata Disease Countermeasures was organized in 1968, there were hardly any movement of support by general citizens.

Nowadays, concerted action by the residents, ombudsman, and the Japan Federation of Bar Associations may move. In those days in which the conditions are different from those at present, the social welfare commission or any human rights protective committee of the district, or the Japan Federation of Bar Associations did not move. At any rate, it was very difficult to act contrary to Chisso on the side of the patient party in the town governed economically by the company, except for only a part of people.

The residents of the town were always identified with the company; it means that they may move in the good direction or ill direction. The Minamata disease affair was an example of the ill movements of the conspiracy of the company with the residents.

(3) Lessons

1) Transmission of precise information for judgment by the local residents

The residents of the town governed economically by the company are always identified with the company, but if a person's fate is entrusted to a company, the trust may often betrayed by the company.

Arguments of the local residents, which may have to be adopted in politics, are very important for

the detection, prevention, and the relief of victims. For this purpose as well, information and correct knowledge of Minamata disease must be transmitted precisely to the local residents.

[*Discussion 19*]
What role did the labor union of the causative company play?

(1) Circumstances

On August 19, 1959, the New Nippon Nitrogen Labor Union passed at a board of representatives that the Union supports the fishing people's struggle as a rule.

In response to the fishing people's riot affair on November 2, 1959, the Union hold an emergency board of representatives on November 4, and expressed its regret that such an inauspicious event occurred, although early inspection of the cause and countermeasures against patients and fisheries must be promoted.

On November 6, 1959, the Union decided to be strongly opposed to cessation of the factory operation, and presented a resolution to the President of Chisso, the Prefectural Governor, and the Chairman of the Kumamoto Prefectural Alliance of Fishing Cooperatives.

At the end of 1959, Chisso offered the following conditions at the time of the negotiation about a lump sum: (1) the contents of the management are not written in bills of the Union; (2) the tents lent to the patients' families, who staged a sit-down demonstration in front of the plant, are returned to the plant. The Union also accepted the conditions. In those days, labor and management showed in one the attitude that production had priority over everything and the company was protected.

Keen labor-management disputes for the Chisso's stready wage system occurred during the period from April 1962 to January 1963. The New Nippon Nitrogen Labor Union was divided into the New Nippon Nitrogen Labor Union (the First Union) and the New Nippon Nitrogen New Labor Union (the Second Union), resulting in the division of the shops and citizens into two parts. Because of the spread to the riot, a riveted feeling of confrontation remained not only among the Chisso laborers but also among the citizens. During this period, Minamata disease was kept out from the citizens' concern, and the Chisso's internal studies for inspection of the cause were also discontinued and became extinct.

On August 29, 1968, Chisso stopped a plan to export mercurial waste fluid (ca. 100 tons) stored by Chisso to Korea in response to the protest by the New Nippon Nitrogen Labor Union against the plan. At the regular conference on August 30, the Union decided to the effect that "We think shame to have ever done nothing, and must have the company approve its responsibility for Minamata disease, support the victims of Minamata disease, and struggle with the disease".

(2) Discussion

A. Facilitation of the tendency of the general public becoming indifferent to the Minamata disease affair by labor dispute

In 1959 the fishery disputes were solved, factory waste water disposal facilities were established, and the contract about the present of money in token of the company's sympathy was signed. Thus, Chisso proceeded to settle the Minamata disease affair. In addition, a keen labor-management dispute about the steady wage system broke out, and the problem with Minamata disease was further kept from the residents' concern.

B. Responses of the First Union to Minamata disease patients with the opportunity of defeat of labor dispute

After the stabilized wage disputes, the labor union was divided. Under the situation, the discriminative treatment for the First Union gave a clue in understanding the situation of the patients, and sympathies with Minamata disease patients spread in the First Union. Labor accidents frequently broke out in the Minamata plant, and the First Union increased criticism of the company from a viewpoint of structure, i.e., "there are labor accidents inside, and there are outbreaks of Minamata disease outside".

"The declaration of shame" made by the First Union is revolutionary as the whole movement of labor unions as well in Japan, because the organization's completeness, i.e., the absence of mistakes in the movements of labor unions, was denied by the declaration.

(3) Lessons

1) A breakaway from force of habit of labor unions in Japan, i.e., those by companies, which antagonize the victims in one united body of labor-management

Since the labor unions in Japan are unions by companies, there is always the fear that they may antagonize the victims of problems with environmental pollution and environment in cooperation with the companies.

However, the involvement of labor unions with countermeasures against environmental pollution also leads to the elevation of their own social status. For this purpose as well, the unions must not only pay attention to their interests but also be so conscious that they will act with adequate recognition of social conditions surrounding the companies.

[*Discussion 20*]
What do outbreak of fetal Minamata disease mean? How about the approach to them?

(1) Circumstances

In the district where many patients were observed in Minamata, many children have been found to have had symptoms resembling those of cerebral palsy since the former half of the period from 1955 to 1964. In 1959, Prof. Shoji Kitamura reported these infantile patients.

Prof. Sukenori Nagano and his colleagues of the Dept. Pediatrics, Kumamoto University School of Medicine also examined infantile patients and suspected the relations to Minamata disease.

In March 1961, one of the patients, who was a girl aged 2 years and 6 months, died. As a result of autopsy by Prof. Tadao Takeuchi et al., the condition was concluded to be fetal Minamata disease. Asst. Prof. Tokuomi et al. also confirmed the result from findings of the brain. Masazumi Harada and his colleagues of the Dept. Psychoneurology also regarded the 16 cases found in Minamata as being the same disease due to the same cause, and diagnosed the cases as transplacental Minamata disease.

In September 1962, the second autopsied case was also diagnosed as fetal Minamata disease from pathological findings. Therefore, the 16 cases, whose diagnoses had been deferred, were diagnosed as fetal Minamata disease in November of the year.

(2) Discussion

1) High incidence of infantile cases showing symptoms and signs of cerebral palsy were observed in the second half of 1950s, but any relation of the outbreak to Minamata disease could not be confirmed. This was owing to the following reasons: it has not been generally considered that toxic substances easily pass the placenta, it has not been demonstrated that methylmercury passes the placenta; the patients themselves have

not had the contaminated fishes or shellfishes; their mothers had no obviouse clinical signs of Minamata disease; both mothers and their children showed high mercury levels in hairs, but mercury levels in hairs were also high in healthy mothers and their children living in the same district, etc.

2) It has nearly been confirmed from clinical and epidemiological aspects that the cases of cerebral palsy are related to Minamata disease, but there was no relief until autopsies of these two cases. Thereafter, only 5 cases more were found by Asst. Prof. Yoshitaka Harada et al. of the Dept. Pediatrics, but many suspected cases were found subsequently (after the Governmental unified view was offered). Some of them were already dead.

When the definite diagnosis was made in 1962, the administration should have made efforts to detect patients with similar symptoms, but such a countermeasure was not taken. The decision of a new fact requires scientific circumspection, but it should not delay the actual relief.

3) Despite the fact that the cause was unknown, no epidemiological survey using controls was conducted. Many of the cases diagnozed as fetal Minamata disease were serious cases, but no investigation was conducted about manifestation of the slight influence. If it had been investigated, even the influence of a trace of methylmercury on fetuses, which could not have been detected later, might have been determined.

4) Some chemical substances transfer to infants via the breast milk and pass the brain-blood barrier and the placenta-blood barrier. The outbreak of fetal Minamata disease seem to have given a warning of these possibilities again to human beings.

(3) Lessons

1) Investigation should be conducted first on a new event.

When a new event, e.g., influence on a fetus, occurs, investigation of the actual condition should not be conducted until scientific and medical demonstration is completed.

2) Necessity for rigid epidemiological survey from the early stage of outbreaks

In the case as well, in which the influence on fetuses is elucidated, rigid epidemiological survey using controls is needed from the initial stage after the outbreak.

3) The existence of a variety of mild cases

In damages of environmental pollution to health, it must be kept in mind that the severity depends on the degree of exposure to environmental pollution, and combinations of symptoms are not always the same.