

## CHAPTER 1.

### Movements during the Pperiod from the Times When the Signs Appeared to May 1956 when Minamata Dsease was Officially Dscovered

#### *1. Background of the times, positioning of Chisso in industrial policy, position of Chisso in economic society of the district, and characteristics of the technological development by Chisso*

##### *(1) Situation of economy*

Industrial reconstruction in Japan was proceeded relatively from 1945 onward, early after World War II.

Since around 1955, heavy chemical industrialization policy aiming at conversion of energy resources from coal to petroleum has been promoted, and the time when high economic growth of an annual rate of ca. 10% is achieved has arrived. The times of high economic growth lasted until 1973 when the primary oil shock occurred. In the times, Japan pushed on economic growth by the joint efforts of the Government and people with the national aim of increasing international economic competitive force.

##### *(2) Position of Chisso in the local economic society*

#### *A. Location of Chisso in Minamata*

Minamata situated on the west side of Kyushu faces the Shiranui Sea (Yatsushiro Sea), and the Amakusa Islands are on the opposite shore of the sea. Minamata is adjacent to Kagoshima Prefecture on the most southern tip of Kumamoto Prefecture. The plain at the mouth of the River Minamata running in the center of the city is narrow, and there is a mountain close to the sea. Because of these situations, general traffic means was a sea-based route.

In those days of 1898 before the invasion of Chisso, Minamata was a fishing and agrarian village of a total of 2,542 houses. The industry at Minamata was characterized by the salt-making industry, which was the only cash income for farmers. However, the industry was discontinued by the Government Monopoly in Salt Act (1910). Lumber and so on were carried from the port in Minamata, which was flourishing as “the window” through which coal was carried to the Ushio gold mine at Okuchi Village in Kagoshima Prefecture adjacent to Minamata.

[Comments] Many inhabitants of the Amakusa Islands on the opposite shore of the sea have come to the shore of Minamata for fishing. A part of them have been settled in Minamata and formed colonies of fishing people.

Minamata Bay is a double inlet surrounded by Myojinsaki in the Shiranui Sea and the off-lying island, Kojishima. It is always waveless. There are natural gathering-places for fish, such as beaches and sea shores inside and outside the Bay. In the shade of pine woods along the shore, a variety of fishes and shellfishes gathered naturally, providing best spawning grounds. Thus, Minamata Bay was one of the best fishing grounds in the Shiranui Sea.

The founder of Chisso, Sitagau Noguchi who was an electric engineer, established Sogi Electrics, K.K. in 1906. He constructed a hydroelectric power plant at the Sogi Falls in Okuchi Village in Kagoshima Prefecture and supplied electric power to the Ushio gold mine, etc. The essential purpose of the construction was to produce carbide that generates acetylene, which is a raw material of organic synthetic chemistry, by using surplus electric power and that from the second electric power plant constructed subsequently.

On constructing a carbide plant, Minamata was the best place from the aspect of the geographical features

as well, for the following reasons: the Amakusa Islands, from which lime-stone and good smokeless coal as the raw materials were abundantly produced, were situated on the other side of the Bay; there were good seaports for transportation of these raw materials and products; there was abundant water necessary for the development of electric power in the place backing against the city. People of the district have also eagerly invited a manufacturing company to set up its plant in the place. In March 1907, Noguchi started constructing a carbide production plant in Minamata Village, and in October of the year transmission of electricity from Sogi Electric, K.K. was started. In August 1908, Sogi Electric, K.K. was combined with a carbide production company, and the direct ancestor of the present company Chisso, i.e., Nippon Nitrogen Fertilizer Co., Ltd. was established.

#### *B. Development of Chisso and the increase in the influence of the company on the districts of Minamata*

Chisso succeeded in production of metamorphic ammonium sulfate and synthetic ammonium sulfate, and sequentially constructed electric power plants at various places in Kyushu. During the period, the scale was enlarged by constructing plants at Yatsushiro and Nobeoka. The amount of electric power produced was 880 kw in 1908, which reached ca. 40,000 kw in 1927 when ammonia synthesis by Casale's method was started at the Chisso Minamata plant.

In the 1930s Chisso took the lead in chemical industries in Japan in advance of the old interests of Mitsubishi, Sumitomo, and Mitsui as representatives of rising chemical industries with Mori, Nissou, and Riken. These rising industries were characterized by the following: the founder was a technologist or had a full understanding of technology; these rising industries aimed at electric chemistry in which cheap homemade hydroelectric power was used for production of the raw materials, while the interests used coal as the raw materials.

Since the Sogi Hydroelectric Power Plant was established in 1906, the persons who had driven carriages in order to carry coal, i.e., a power source of gold mines, from the Minamata Seaport, lost the job. In Minamata where the salt-making industry was also abolished, the way how to get cash income was replaced by employment to the Chisso Minamata plant. The bloc economy in Minamata was increasingly dependent on Chisso along with the development of Chisso. In those days, labor accidents such as explosion frequently occurred at the Minamata plant. Wages for the plant workers were also lower than daily wages for the people employed from the district to the plant, but they rose along with the development of the plant. A number of labors gathered the plant from the surrounding districts. It changed to the boast for the inhabitants of Minamata to become a factory worker of the plant. In general, there was much difference in pay treatment among classes of factory workers. At the Chisso Minamata plant as well, there was stern difference in employment conditions between employees of the company and the factory workers employed from the people of the district until the postwar period.

In April 1889 when Minamata Village was established according to the organization of cities, towns, and villages, the number of the inhabitants went on increasing along with the development of the Minamata plant: The village contained 2,400 houses with 12,040 inhabitants; the number of the inhabitants was 17,192 in December 1912 when the town organization was implemented; and the town contained 2,911 houses with 18,681 inhabitants in 1916. In 1949 when the municipal organization was implemented in Minamata after World War II, the city contained 8,584 houses with 42,137 inhabitants. In 1956 when Minamata disease was officially discovered, Kugino Village (with 3,258 inhabitants) was included in the city, and the number of the inhabitants peaked 50,461. In 1960, employees of Chisso and the subcontract companies accounted for 4,757 (ca. 24%) of the industrial population 15 years of age or over (19,819).

During this period, the specific gravity of the Chisso Minamata plant in the bloc economy in Minamata further increased. "Minamata Kojo Shinbun (Chisso Minamata Plant News)" of Chisso showed off the influence of Chisso by describing that the sum of the municipal property tax of the Minamata plant and the municipal tax of its employees exceeded 50% of the income of municipal rates in around 1955, and that

Chisso must be the first consideration for Minamata and Chisso is just a money-maker for Minamata City.

Thus, Minamata changed to so-called “the town supported by a company”, which is highly dependent on a single company and which is much influenced by the company. The inhabitants have also come to consider that only the development of the Minamata plant was prosperity of the town.

Under these circumstances backed by such consciousness of the inhabitants, the Minamata plant has been actively involved with the local government’s administration. In 1926, Jiro Sakane, an ex-employee of the Minamata plant, became the town manager, and the plant manager and the 7 persons interested in Chisso became members of the town assembly. In the same year, Minamata Station of the Japanese National Railways started practice in front of the Chisso Minamata plant. In 1950 after World War II, Hikoshichi Hashimoto, an ex-manager of the Minamata plant, who had developed technology of production of acetaldehyde, became the Mayor, and many employees of the plant became the members of the assembly. A plan of the opening of seaports in Minamata was established with the aim of sending in and out the raw

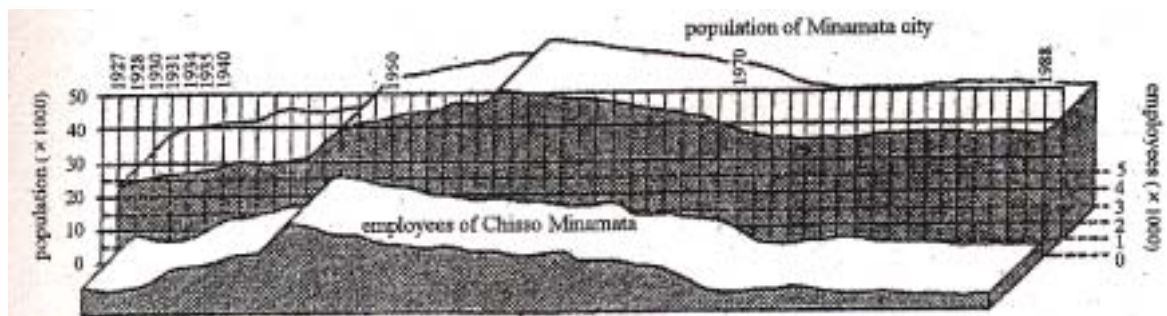


Figure 2. Changes in the number of employees of Chisso (from the exhibit of Minamata Disease Municipal Museum)

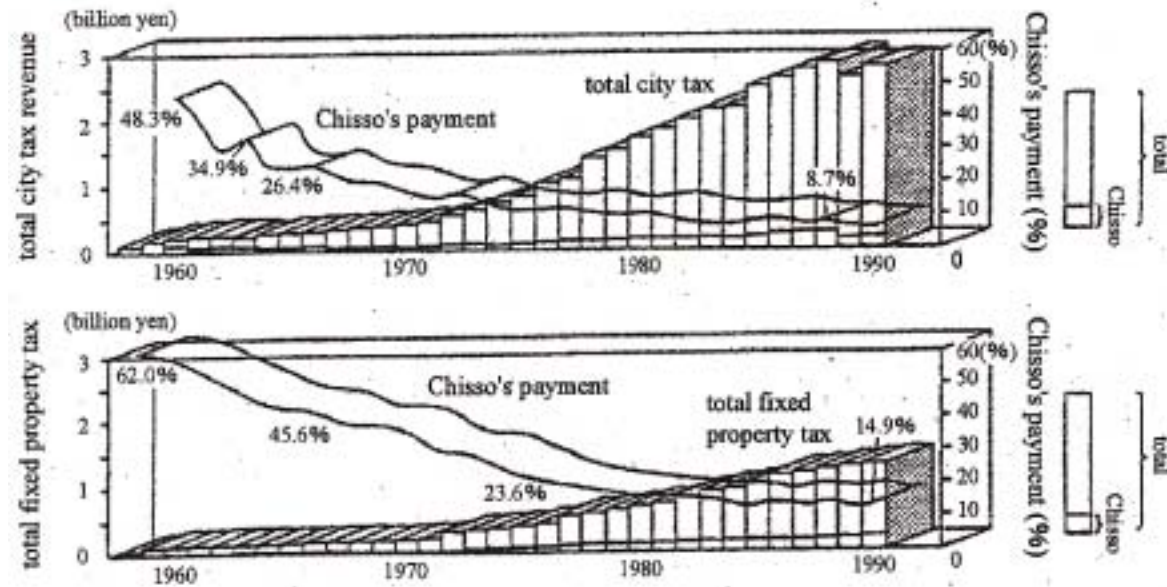


Figure 3. Proportion of the amount of taxes of Chisso in the city tax revenue (from the exhibit of Minamata Disease Municipal Museum)

materials and products at the plant. To promote the plan, many privileged measures were taken; bearing the public expenses for dredging of the harbor base buried in industrial waste in Minamata Bay, privileged measures against the municipal property tax of the Minamata plant, and the monopolistic use of water rights of the Minamata River. Thus, the Hyakken Seaport and the shoreline where the citizens had enjoyed sea bathing have changed to dumping grounds for the carbide residue.

### *(3) Positioning of the Chisso Minamata plant in the industrial policy in Japan*

#### *A. Postwar reconstruction of Chisso*

The principles of the synthesis of acetaldehyde by using mercury as catalyst and using acetylene generated from carbide as the raw material has long been known. The process has already been industrialized in Germany, etc. Chisso developed its original method for the production. In 1932, Chisso started producing acetaldehyde earlier than other companies.

Thus, the ability of Chisso to investigate and develop was constantly at the top level, and Chisso has led technology of Japanese chemical industry before the war. With such technological knowledge, Chisso invaded Korea for developing the market, and established a large-scale hydroelectric power plant in Korea and the northeastern part of China. As Korea Nitrogen Fertilizer Co., Ltd. (Chosen Chisso Hiryo), Chisso created the most large-scale electrochemical kombinat, centering on the big Hungnan plant (including 45,000 employees), in the Eastern countries. It was situated in the important position as the munitions industry including fertilizers, oil and fats, gunpowder, etc.

On promoting postwar reconstruction, the Government paid special attention to production increases in fertilizers and coal, and promoted so-called the priority production system. The Chisso Minamata plant received big damage by bombings in 1945, and discontinued the production tentatively. After World War II, however, Chisso undertook restoration of the fertilizer division. Two months later, Chisso started producing fertilizers again in October 1945, next year the production of acetic acid was also started again. The production scale was mostly restored to that before the war in around 1950. Since all overseas fortunes (the Hungnan plant, etc.) of Chisso were requisitioned, many executives and engineers of the Korea Nitrogen Fertilizer Co., Ltd. came to Minamata and assumed leadership at the Minamata plant.

In 1950s, profits from organic synthesized products were gradually increased, while those from inorganic synthesized products such as fertilizers were decreased.

#### *B. Chisso predominating over all others in the market of acetaldehyde*

The amount of acetaldehyde and synthetic acetic acid produced, which are the raw materials of a plasticizer for plastics, was rapidly restored thereafter; in 1955 it reached 10,000 tons, and the postwar peak, 45,245 tons, in 1960. In those days, 8 plants of 7 companies, as shown in Table 1, have produced acetaldehyde, and Chisso has constantly occupied 1/3 to 1/4 of the amount of domestic production.

The production of acetaldehyde and acetic acid by using carbide as the raw material has been the main enterprise of organic synthetic chemical industry until the industry was contemplating branched out into the petrochemical industry in the postwar period of high growth of Japanese economy. Chisso moved into the lead of the domestic production and had influence on the market. During the 10-year period from 1950s, technological improvements and reforms have been sequentially made and technical installations have also expanded in the organic synthesis division of Chisso plant. In particular, Chisso succeeded in inducing and synthesizing octanol, which had been obtained only by import, from acetaldehyde in 1952. Chisso manufactured a plasticizer DOP, which is necessary for the molding of poly-vinyl chloride, and nearly occupied the domestic production. In 1959, the amount of octanol produced by Chisso occupied 85% of the domestic production.

Under these circumstances, Chisso continued to increase production of acetaldehyde the raw material of octanol in order to supply the demand of octanol during the period when other companies decreased operating rate for the process of acetaldehyde production. Thus, Chisso accumulated the capital as reserve capital for the conversion to the petrochemical industry.

Table 1. Plants of production of acetaldehyde by acetylene water addition reaction

Plant	Location	Operating period	Productivity (1963)	The results of production (1960)	The place where wasted water was discharged
Chisso Minamata plant	Minamata City, Kumamoto Pref.	March 1932 ~May 1968	48,000 t	45,245 t	Minamata Bay (tentatively at the mouth of the Minamata River) Siranui Sea
Dainippon Celluloid Arai plant	Arai City, Niigata Pref.	March 1937 ~March 1968	24,000	22,142	Shibue River , Seki River The Sea of Japan
Japan Synthetic Chemistry Kumamoto plant	Uto City, Kumamoto Pref.	January 1944 ~April 1965	18,000	15,969	Hamato River Ariake Sea
Japan Synthetic Chemistry Ohgaki plant	Ohgaki City, Gifu Pref.	February 1928 ~September 1964			Suimon River, Ibi River Ise Bay
Showa Denko Kanose plant	Kanosemachi, Higashiurahara gun, Niigata Pref.	January 1936 ~January 1965	12,000	11,800	Agano River The Sea of Japan
Denki Kagaku Aomi plant	Aomimachi, Niigata Pref.	April 1945 ~May 1968	12,000	10,890	Oumi River The Sea of Japan
Mitsubishi Gas Chemical Matsuhama plant	Niigata City, Niigata Pref.	July 1960 ~January 1964	10,000	4,244	Niigo River The Sea of Japan
Tekkosha Sakata plant	Sakata City, Yamagata Pref.	April 1939 ~December 1964	3,600	2,826	Sakata Seaport The Sea of Japan

(Prepared from “*Minamata-byo-20-nen no Kenkyu to Konnichi no Kadai-* (Minamata disease--Experience over the two decades and the present tasks confronting the disease)” edited by Sumio Arima)

The amount of octanol production was compared on the basis of the data stored in Chisso; 3,233 tons in Chisso vs 1,781 tons in other companies in 1955, 7,758 tons in Chisso vs 1,647 tons in other countries in 1958, and 13,147 tons in Chisso vs 1,378 tons in other companies in 1959. The data show that the amount of octanol produced by Chisso rapidly increased while that by other companies decreased.

The big task confronting the chemical industry of Japan and the Ministry of International Trade and Industry (MITI), which guides it, was that how the conventional electrochemical system could have been rapidly converted to the petrochemical system for the purpose of strengthening their competitive positions in world markets for freeing of trade of chemical products. MITI has prepared “Measures to foster petrochemical industry” in 1955, and carried forward the 1st-stage plan of the conversion from electrochemical to petrochemical system (E-P conversion plan), and the 2nd-stage E-P conversion plan. All companies have strived to become the first in participating in the Ministry’s policy aiming at promoting

Japanese economic independence and strengthening Japanese competitive position in world markets.

Chisso has also searched for oil companies, with which it could cooperate, and the place of location of industry, so that Chisso would have not missed the chance to participate in the 2nd-stage E-P conversion plan. In October 1959, Chisso cooperated with Maruzen Oil Co., Ltd., and made its decision to establish a new kombinat at Goi in Chiba Prefecture. MITI has regarded the Chiba kombinat as the efficient kombinat by reasonable investment in plant and facilities.

At the end of December 1959 when the E-P conversion plans were come out fully by various companies, the Ministry presented "Conduct policies of future plans to mass-produce the petrochemical industry", and showed the policy (scrap-and-build system) aiming at abolishing old technical installations simultaneously with conversion of chemical industry to petroleum industry. Eight plants of 7 companies including Chisso, which had produced acetaldehyde in those days, were to abolish the facilities for production sooner or later. In spite of such prospects, the new establishment of the 7th-stage technical installations for acetaldehyde was completed in the Chisso Minamata plant in November 1959, and the operation was initiated.

#### *(4) Characteristics of the technological development in Chisso*

##### *A. Advanced development of technology in Chisso*

The founder of Chisso was an engineer, a graduate of the Electrical Engineering Division of the Tokyo Teikoku University (the present University of Tokyo). During the period from 1955 to 1964 when Minamata disease have been discovered, Chisso has been evaluated highly as the company, which has been leading the fashion of chemical industry in Japan and in which much importance has been put on engineers, by students who have majored in applied chemistry. Under these circumstances, only the leading students have been employed to Chisso.

The history of Chisso shows with certainty that they have always developed new technologies by themselves. In 1932, Hikoshichi Hashimoto and his co-workers developed their original industrial technology for acetaldehyde (mother liquor circulation method), then succeeded in manufacturing products of butanol, acetic acid, ethyl acetate, anhydrous acetic acid, fibrin acetate, and vinyl acetate. In 1941, Chisso succeeded in synthesizing vinyl chloride from acetylene for the first time in Japan.

The Minamata plant was designed to develop organic synthetic chemistry of acetylene, and has taken the lead in developing technology in the pre-war Japanese chemical industrial circles. Chisso created the biggest electrochemical kombinat in the East centering on the Hungnam plant constructed in Hamgyongnomdo of Korea by using these technologies developed in the Minamata plant.

##### *B. Absence of consideration to labor safety and environmental pollution*

Organic chemical factories such as the Minamata plant are dangerous workshops in which instruments are likely to induce explosions. There are many hazardous chemical substances in the raw materials, and a variety of dangerous articles are included in waste products from factories. For this reason, particular consideration was required for the factories from the aspect of industrial hygiene as well. In Chisso in those days, however, consideration to labor safety of workers of the plant has been postponed by the company's pursuit of its profits. The Labor Safety and Health Rules in those days had no regulations regarding organic mercury.

In 1930, Zangger, an industrial health scientist of Switzerland, has reported a patient with suspected organic mercury poisoning, who has been a worker engaged in the process of acetaldehyde production. In 1937, Koelsch, an industrial health scientist of Germany, has cited the article of Zangger and described that attention must be paid to the process because the light volatile methylmercury compound is secondarily generated from mercury used as catalyst in the process. Some overseas reports have shown the possibility

Table 2. Acetaldehyde production and the situation of operation of the installations in the Minamata plant

Year	Acetaldehyde production (t)	Stage							N.B.						
		1st	2nd	3rd	4th	5th	late 5th	6th		7th					
1932	209.763	Started in May 1932	Started in April 1933	Started in October 1934	Started in September 1935	Started in September 1937	August 1945	August 1945	Destruction of the plant by bombings Initiation of restoration in February						
1933	1297.410														
1934	2583.180														
1935	3628.330														
1936	5133.750														
1937	6252.120														
1938	7386.130														
1939	9063.108														
1940	9159.187														
1941	8700.148														
1942	8480.195	Stopped	Stopped in September 1945	Succeeded in April 1949	February 1946	February 1946	February 1946	A co-catalyst MnO <sub>2</sub> was replaced with FeO. Industrialization of octanol (for the first time in Japan)							
1943	7469.934														
1944	7295.541														
1945	2263.815														
1946	2252.830														
1947	2362.703														
1948	3326.256														
1949	4391.208														
1950	4484.016														
1951	6248.467														
1952	6147.777	Started in August 1953	Started in May 1956	Started in August 1953	Started in August 1953	Started in August 1953	Started in August 1953	Discovery of Minamata disease in May							
1953	6592.261														
1954	9059.140														
1955	10632.776														
1956	15919.042														
1957	18085.091														
1958	19191.351														
1959	31921.222								Started in November 1959	Started in May 1968	Started in November 1959	Started in November 1959	Started in November 1959	Started in November 1959	In February, a device for reaction mixture oxidation was completed. In September, the drainage channel for factory wastes was changed from the Hyakken Seaport to the mouth of the Minamata River.
1960	45244.790														
1961	42287.970														
1962	26500														
1963	38500														
1964	41029														
1965	26581														
1966	17960														
1967	11961	Stopped in May 1967	Stopped in May 1967	Stopped in May 1967	Stopped in May 1967	Stopped in May 1967	Stopped in May 1967	In August, the essential drain circulation system. The plant was improved, so that metal mercury could be used as catalyst.							
1968	783														
1969	11961	In June, complete circulation system of waste water	In June, complete circulation system of waste water	In June, complete circulation system of waste water	In June, complete circulation system of waste water	In June, complete circulation system of waste water	In June, complete circulation system of waste water	In June, complete circulation system of waste water							
1968	783														
1967	11961	In May the operation was ceased.	In May the operation was ceased.	In May the operation was ceased.	In May the operation was ceased.	In May the operation was ceased.	In May the operation was ceased.	In May the operation was ceased.							
1968	783														

Cited from "Minamatabyo -20-nen no Kenkyu to Konnichi no Kadai-(Minamata disease--Experience over the two decades and the present tasks confronting the disease)" edited by Sumio Arima

of organic mercury being secondarily generated simultaneously with acetaldehyde formation and the occurrence of new poisoning, which was different from inorganic mercury poisoning. However, the data from the reports have never been put to practical use in the process of inspection of the cause of Minamata disease. Transient by-production of organic mercury as an intermediate has been known by the engineers in Japan as well, but the organic mercury was not suspected to be a lower alkyl mercury with high toxicity. It has also been considered to have soon disappeared. Therefore, the by-production has not been reported to any physician or any person in charge of industrial health by any chemist. Chisso has made efforts to collect information on technical revolution, but they have not collected information on industrial health.

[Comments] The article by Zangger was presented as the evidence by the accuser of the legal action in Kyoto regarding Minamata disease in May 1987. Although the copy of this article has been obtained by the University of Tokyo School of Medicine in 1938, and a few universities have also obtained the copies of the article, nobody has mentioned this paper during the investigation of Minamata disease until 1987. The house documents of Chisso as of May 10, 1947 referred to the contents of "Chemistry of Acetylene" (1921) by Newland et al., describing as follows: "It is obvious that a white precipitate of organic mercury compound is obtained as an intermediate, but its chemical composition may not have been determined. According to the literature, trimercury-aldehyde is believed to be induced by the reaction ("Production of acetaldehyde" ed. by Shigeo Shinomiya)".

The factory wastes from the Minamata plant have included mainly inorganic materials such as calcium carbonate in the days when fertilizers have been mainly produced. When the synthesis of acetaldehyde and acetic acid has been initiated, large quantities of various chemical substances have come to be included in the factory wastes. These chemical substances have included not only the methylmercury compound, which was the cause of Minamata disease, but also a variety of harmful materials such as heavy metals. The risk of the factory wastes was markedly increased. However, the Minamata plant had no realization that there might be a risk of pollution of the environment outside the plant with the waste water. There were no facilities for waste water management, which aimed at preventing environmental pollution, in the plant.

Around the Minamata plant, there have been disputes between the inhabitants and the plant about floating dust and poisonous gas discharge from early on. In 1944, the farm products from the lower part of the plant died because of the Marushima Drainage channel, and the farm products from the hill at the back of the plant died because of particles of soot from the plant. In fact, the inhabitants of the Marushima district petitioned the municipal assembly for countermeasures against the damage from fallen soot in 1955.

## *2. Early signs before the official discovery of Minamata disease*

### *(1) History of disputes about the fishing industry*

The history of the Chisso Minamata plant is that of sea contamination by dumping of factory wastes and of the damage of fishery with the sea contamination. The history of the plant was that of conflicts between Chisso and the damaged fishing people.

The conflicts between fishing people and the Minamata plant about marine pollution have already started since the Taisho Era; the Minamata Fisheries Cooperative Association (MFCA) has proposed indemnification of damages to fishery with dregs stored in the waste water from the plant and by reclamation of the foreshore to Chisso for several years. In 1926, MFCA discontinued to require the compensation because of straitened circumstances, and instead received ¥1,500 from Chisso as a money present of the company's sympathy, provided that the Association would not make a claim permanently on the company.



In 1932 when Chisso started producing acetaldehyde, the severity of pollution with the waste water was increased. The MFCA often negotiated with the plant about indemnities. The MFCA, which was in the red figures, resigned a part of its fishery right to approve reclamation of the foreshore and received ¥150,000 as indemnities in the negotiations on indemnification of fishery damages in 1943. In 1951 as well, the MFCA obtained a loan of ¥500,000 from Chisso in exchange for reclamation of the foreshore.

In 1951-1952, the pollution of the area in the vicinity of the Hyakken Seaport, where there was the outfall for waste water from Chisso, became increasingly severe. Although it was unknown whether the phenomenon would be attributed to a toxic substance or strong-acid factory wastes, dead fishes had putrid smells, and the fishery was so decreased that the MFCA repeated to request of the Fisheries Section of Kumamoto Prefecture to conduct research on the actual condition. The Fisheries Section requested of the plant to report the waste water, and furthermore, Reiji Miyoshi, the Chief Clerk of the Section, went to the actual place in August 1952. He requested of the plant to explain the properties and the management of the waste water from the plant, but the plant was not cooperative, explaining that “the waste water is not so harmful”.

In the report (of mission) on the spot investigation by the Chief Clerk Miyoshi, it was concluded that the fishery has come to decrease because of the general waste water discharged from the Chisso Minamata plant to the Hyakken Seaport and the dregs accumulating in the Seaport, indicating that “the waste water needs to be analyzed and the compositions need to be clarified, as the occasion demands”. The report by Miyoshi was attached by a report by Chisso as well, “The situation of waste water management in the plant”, in which “mercury” was overtly described as the raw material in the process of acetic acid management. Thereafter, however, the waste water has not been investigated at the level of the Prefecture, and this report was kept from the public eye without its being put to practical use for the subsequent inspection of the cause or countermeasures against the waste water discharge.

## *(2) Abnormal phenomena in organisms and the occurrence of Minamata disease*

Since around 1953, strange phenomena have become apparent in fishing villages and village communities around Minamata Bay; cats ran around to die [people of the district came to call the phenomena “neko odori-byo (dancing cat disease) or cat epilepsy], and crows and birds living along the seashore suddenly fell down while flying. Fish catches have decreased annually thereafter, and the damages have become widespread outside Minamata Bay.

In 1954, almost all of the 100 or more cats died mad in a fishing village (Modo) around Minamata Bay (the phenomena have been observed since about June, 1954), and correspondingly, the cats gotten from other districts died. Thereafter, rats rapidly increased, by which fishing nets were eaten away. Since the frequency of the damage increased, fishing people asked the Health Section of the City Government to get rid of rats. This matter appeared in an issue of Kumamoto Nichinichi Shimbun (The Kumamoto Daily News) on August 1, saying that “All cats were totally destroyed by feline epilepsy, and people are ready to cry for help against the remarkable increase in the number of rats”.

Retrospectively, the report was the first one showing unusual changes of organisms due to the methylmercury compound, but as the measures taken to counter the phenomena by the City Government, rat eliminators alone were delivered, but the City Government did not inspect the reason why the cats died mad.

The unusual situation eventually spread the inhabitants. At the end of 1953, there have been some patients with peculiar neuropsychic symptoms. In 1954, patients with diseases of the central nervous system, which were diagnosed with difficulty, have come to visit the Chisso Minamata Plant Hospital and practitioners of the district.

In 1955, two young people complained of numbness of the extremities and were examined at clinics of the district on an outpatient basis, but any diagnosis was not made on that occasion. They were admitted to the Kumamoto University Hospital for examination, and diagnosed as having had “polyneuritis of unknown

cause” on the examination.

水俣市 茂道部落

# 猫てんかんで全滅

## ねずみの激増に悲鳴

三十一日水俣市茂道漁業石本賢重さん(三三)は市衛生課を訪れ、ねずみが急増して漁村を荒し回り、手がつけられないと感嘆方を申し込んだ。

同部落は百二十戸の漁村だが、不思議なことに六月初めごろから急に猫が狂い死し始め(部落ではねづみかんと呼ぶ)と、遂に百餘匹いた猫がほとんど全滅してしまふ、反対にねずみが急増、大騒動で部落中を荒し回り、被害はますます増大する一方、あわてた人々は各方面から猫を買いつけたが、これまた気が狂ったようにギリギリ舞した。

なお同地区は水田はなく農薬の關係なども見られず、不思議がらるる気味もあるやうな衛生課でもねずみ被害ののり田(すいとう)はない。

“Cats were totally destroyed in Modo Village, and people are ready to cry for help against the remarkable increase in the number of rats.” (A morning paper of August 1, 1954, *Kumamoto Nichinichi Shimbun* (The Kumamoto Daily News))

On July 31, Torashige Ishimoto (aged 37 years), one of the fishing people at Modo, Minamata City, visited the Health Section of the City Government and asked to get rid of rats, because the number of rats rapidly increased, which did damage to the village, and nothing could be done about the phenomenon.

The village is a fishing village with 120 houses. From early in June onward, cats suddenly began to die mad (the phenomenon is called “feline epilepsy” in the village), and almost all (about 100) cats were totally destroyed. In contrast, rats rapidly increased and did damage to the village. While the damage is being increased, the people got cats from various places, but even the cats spun themselves round and round to die as if they became mad. Ultimately, the people implored the City Government for the phenomena. Since there are no paddy fields in the district, the relation to agricultural chemicals is not considered. The people greatly wonder about the phenomena and get nervous unease. The Health Section decided to exterminate rats.

Table 3. Abnormal conditions of fishes and shellfishes, birds, cats, etc.

Year	Fishes	Shellfishes	Seaweeds	Birds	Cats, pigs, etc.
1949   1950	In “Mategata”, <i>Karuwa</i> , octopuses, and sea basses came to the surface, and they could be caught by hands.	No oysters adhered to any ship made fast to the bank near the outfall for the wasted water from the plant in the Hyakken Seaport.	Seaweeds in Minamata Bay began to appear whitish, and gradually rose to the surface.		
1951   1952	In Minamata Bay particularly, black porgies, croakers, porgies, sea basses, scorpion fish, and <i>kusabi</i> rose to the surface.	The number of empty shells of short-necked clams, oysters, fresh-water mussels, snails, etc. markedly increased in Minamata Bay.	The color of sea lettuces, agar-agar, green laver, and <i>wakame</i> seaweed in Minamata Bay began to run, and the amount of seaweeds that drift on the tide was decreased to about one third of the previous amount.	At Yudo, Dezuki, and Tsukinoura, crows fell down, and it became possible to catch <i>amedori</i> by hitting them with a pole.	
1953   1954	The range, in which fishes were observed to rise to the surface, spread from Minamata Bay toward the south, i.e., “Tsubodan”, “Akahana”, “Shin’ajiro”, “Hadakaze”, and “Yudo Bay”. Striped mullets, porgies, scabbard fishes, cuttlefishes, croakers, etc. rose to the surface. In “Yudo Bay”, small horse mackerels ran around in mad.	Extirpation of shellfishes spread from Minamata Bay toward the Tsukinoura Seashore. In 1953, edible cockles grew after a dozen or so years throughout the area lying beyond the place, but those grown within 1,000 m from the shore were extirpated.	The frequency at which seaweeds drift on the tide increased, and the damage to them becomes remarkable.	In Kojishima, Dezuki, Yudo, and Modo, the number of birds, which showed abnormal conditions (falling-down), increased. Crowded crows went in the wrong direction and went into the sea or smashed into rocks.	Cats: One cat died mad at Dezuki in 1953. In 1954, the phenomenon occurred in succession at “Mategata” Myojin, Tsukinoura, and Dezuki, Yudo, etc. Pigs: The same phenomenon as that in the cats was observed at Dezuki and Tsukinoura.
1955   1957	The range, in which fishes rose to the surface, spread on the lower Minamata River, Ohsakigahana, and Nishiyunoko. Porgies, sea basses, black sea bream, striped mullets, etc. came to the surface.	Nasty smells of the extirpated shellfishes assailed their noses along the beach.	The edible seaweeds all over Minamata Bay were extirpated.	The number of the birds that showed abnormal conditions further increased.	The incidence of the same phenomena as those in the cats further increased in the same district. Both house cats and ownerless cats died mad, and there were also many missing cats.

Cited from “*Minamatabyo ni Taisuru Kigyō no Sekinin* (Responsibility of Companies for Minamata Disease)” by the Study Group for Minamata Disease

### 3. Legislation regarding countermeasures against pollution

#### (1) Prewar legislation

The Ashio copper mine pollution is mentioned specially as a prewar affair in which environmental pollution became a big social problem and damaged inhabitants of the district. Since about 1885, waste water from the Ashio copper mine in Tochigi Prefecture has flown out into the Watarase River and damaged the agriculture and forestry. The damages of air pollution have also been added, leading to large-scale protest movements by the inhabitants.

The victims of mine pollution have struggled over the long period including the Taisho and Showa Eras. As a result, habitual practices of indemnification (of damages) were increasingly established mainly for pollution caused by the coal mining. In 1941, however, the Mines Act was amended for the purpose of increasing the coal production aiming at prosecution of the war, and the system of no-fault liability for compensation was introduced.

#### (2) Legislation in the beginning of the postwar period

The postwar administration of environmental pollution started with establishment of “Factory Pollution Control Ordinance” by Tokyo Metropolis in 1949. Since then, a plurality of local governments have regulated pollution control ordinance. In Japan, many complaints have been presented by the inhabitants before the Government took measures against environmental pollution. Under the necessity of legislation, local governments have established ordinance, i.e., legislation by the local governments. Thus, the initiative in the development of environmental administration was taken by local governments in Japan.

At the level of national administration, in 1951, the Commission of Resources Investigation in the Economic Stabilization Board had only few attempts to recommend the Government to establish the Water Pollution Prevention Act and the National Research Institute for the Water Quality from a viewpoint mainly of qualitative preservation of water resources. However, such an attempt was not put to practical use.

[Comments] In those days, the Ministry of Health and Welfare and the Ministry of Agriculture and Forestry appeared to have made efforts to prepare the main principle in the administrative inside on the advice of the Commission, but the movement did not develop into the preparation of a bill under the situation in those days. Then the Ministry of Agriculture and Forestry established “Fishery Resources Conservation Act”, which was regarded as having considered the need for countermeasures against water pollution. Ultimately, the Act functioned only for the purpose of preventing fisheries.

In 1954, “(Old) Cleaning Act” was established, and in 1955, the Ministry of Health and Welfare prepared the main principle of the standard bill of living environmental pollution prevention, and presented it to negotiate with the various fields interested. However, the main principle was opposed by industrial circles and public opinion, as well as the various ministries interested, because it was regarded as being still premature to use. Therefore, the Ministry of Health and Welfare added some corrections to the main principle and presented the resultant main principle in 1957. However, since MITI also presented a bill from an independent standpoint, adjustment was performed between the aforementioned main principle and the bill presented by MITI. No consensus has yet been reached on in the Government, and eventually this bill was not presented to the National Diet.

At the time of outbreak of Minamata disease, the concept of “environmental pollution” or the recognition of “pollution-triggered diseases” (the diseases that are derived from environmental pollution or that may be influenced by environmental pollution), which had been taken up by the press as a problem with environmental pollution in Yokkaichi, has not yet come to stay in general. Any company may also have intended not to invest money in or commit the personnel to countermeasures against environmental pollution,

which have been considered unrelated to production efficiency.

*(3) Legislation of environmental pollution and “harmony with industries”*

In 1958 after the outbreak of Minamata disease in Kumamoto Prefecture, approximately 700 fishing people of the Urayasu Fishermen’s Cooperative Association broke into the Edogawa plant of Honshu Paper Co., Ltd. located in the suburbs of Tokyo concerning fishery damages from the factory wastes. Because of the confused fight between the Fishermen’s Cooperative Association and the plant, Tokyo Metropolitan Government ordered the plant to stop operating tentatively.

Taking the opportunity of this event, (Old) Two Acts of Water Quality were established; i.e., “(Old) The law concerning preservation of the quality of the waters for public use” and “(Old) The law concerning regulations for factory wastes, etc.”. They were epoch-making in the sense that they aimed for the first time at regulating water discharge from plants and factories into the waters for public use. In the former law, “the theory of harmony with industries” was distinctly described as the objective; i.e., “With the aim of promoting preservation of the quality of the waters for public use and of conducting to solve the troubles concerning water pollution, the fundamental items necessary for the aim are established to contribute to industrial mutual harmony and improvement of public health”.

In these laws, the areas or the waters, where a problem with water pollution occurred or may occur, were assigned as “designated waters”, and water quality standards and the maximum permissible limit of draining to the waters were regulated for the purpose of regulating plants, etc. In general, it took about 2.5 to 3.0 years after the occurrence of trouble for examinations of water quality to be conducted in assigning the waters. In the case in which the cause of pollution or the maximum permissible limit of draining could not be distinctly determined, like pollution of Minamata Bay, it took further time for the examination to be conducted. The number of the waters, which could be examined, was limited by restrictions of staff, etc., and these laws could not cope with the situation under which water pollution was rapidly spreading and progressing nationwide. The persons interested in industries and fisheries and representatives of ministries and offices interested participated in the inquiry commissions for the maximum permissible limit, but the direct victims did not attend to them. Since the maximum permissible limit could not be decided without agreement by the ministries that have interests, information, and authority, even the most generous standards were decided after the long time of inquiries.

[Comments] The limit was overcome after the “designated waters” system was abandoned and environmental standards and regulation standards came to be applied to nationwide waters for public use according to “the Water Pollution Prevention Act” replaced by (Old) Two Acts of Water Quality at the 64th Diet, so-called the Environmental Pollution Diet, in 1970. On that occasion, the relationship between law and ordinance was arranged in the law, and it was written to the effect that local public bodies can carry out more strict regulation than that established by the nation according to ordinances.

The Industrial Pollution Room was established in MITI in 1963, and the Environmental Pollution Room was established in the Ministry of Health and Welfare in 1964. There have been no places of duty, which have dealt with environmental pollution, in any central ministry or office.

In 1964, a plan of the development of the Mishima-Numadzu industrial kombinat decided upon by the Cabinet was ceased by movements against the plan. Taking this opportunity, the Industrial Pollution Countermeasures Committee was established in the Lower House and the Upper House of the Diet in 1965. The committee was the first one which suggested countermeasures against environmental pollution as the theme of politics.

In 1967, “The (Old) Environmental Pollution Countermeasures Basic Act” was established. It was a legal framework aiming at comprehensively promoting countermeasures against environmental pollution at the level of the nation. All of the laws, which have been established in the past, were based on the principles

of harmony with economy, but in the Basic Law established in 1967, the following principle was clearly described for the first time: “health comes before everything”. With regard to “Preservation of people’s living environment”, it was described that “harmony of people’s living environment with the healthy development of economy should be promoted”. After the manner of this, (old) Two Acts of Water Quality was amended. It was also suggested for the first time by the Environmental Pollution Countermeasures Basic Act that the Government copes in the mass with the countermeasures against environmental pollution.

Furthermore, at “the Pollution Diet” in 1970, the provision about harmony of preservation of people’s living environment with the healthy development of economy was deleted from the laws concerning environmental pollution, which included the Environmental Pollution Countermeasures Basic Act, for the purpose of clearing away suspicion that economy may take priority over other factors in the attitude to countermeasures against environmental pollution.

<Column> “What is” *kogai* (environmental pollution)?”

A word, “environmental pollution”, appeared for the first time as a legal term for the administration in the River Act. On this occasion, the word meant “injurious public welfare”. In this sense, Shozo Tanaka also called the damage from the Ashio copper mine “environmental pollution”.

After World War II, the word, “environmental pollution”, came to be used for air pollution and noise as well. According to the concept of environmental pollution, environmental pollution indicates the damage to health and property of a number of people and deeds to interfere with the common rights of the public.

At present, an environmental organic law defines “environmental pollution” as follows: “Damages involving human health or living environment (including the property closely related to human life, animals and plants closely related to human life, and the environment of the development and growth) are induced by air pollution, water pollution, soil pollution, noise, vibrations, land subsidence, and bad smells, all of which occur accompanying business activities and others’ activities, among the troubles about environmental preservation.”