

## Epilogue.

### Problems with Environmental Pollution, Which Man is now Confronted with--Conclusions--

The methylmercury compound, the cause of Minamata disease, was generated as a byproduct without industrial utility value and drained in the process of production at a chemical plant. There has been no process that a trace of the methylmercury compound drained in environment exerts harmful action to humans and animals via the biological condensation. With such experience as a momentum, international countermeasures against the safety of chemical substances (International Programme on Chemical Safety) were established. The result that the methylmercury compound had influence on fetuses via the placenta has also disproved common sense of toxicology up to that time.

At present, 100,000 kinds of chemical substances are used as raw materials and materials of products at factories over the world. A considerable proportion of them are considered to have the fixed possibility to exert harmful influence on human health and ecosystem through pathways in environment (environmental risks), although there is difference in extent of the influence. For these enormous chemical substances, the man power or budget, which is required for checking their environmental risks, is not adequate, and the environmental risks of many chemical substances are not yet evaluated adequately under the present situation.

Moreover, harmfulness, which was not predicted at the time of production, may also be discovered owing to advances in science, as in endocrine-disturbing chemical substances (environmental hormones) and flon, although the harmfulness is much different from Minamata disease in terms of the character and importance of the risk of damages to individuals. At present, there are also apprehensions about the influence of long-term exposure to low-concentration chemical substances on ecosystem, the spread of pollution through a plurality of environmental media (air, water, soil, etc.), and the complex influence of chemical substances from a viewpoint of earth environmental preservation.

Nowadays, chemical substances are utilized in various forms and are inseparable from the people's life. However, they have both sides, useful and harmful, and problems with chemical substances are further complicated. With regard to the countermeasures, control alone of drainage and emission is inadequate. Total management from the environmental aspect, which includes the substances used in products and used/abolished as products, is needed. Since the harmful influence of chemical substances remains scientifically unclear in many points, opening of necessary information and individuals' wise acts based on the information are required from a viewpoint that how the environmental risks of chemical substances should be avoided or the risk should be reduced.

When we turn our eyes to various foreign countries including developing countries, there are still a number of areas in which there may be risks of pollution with mercury, e.g., use of mercury for gold refining, pollution with mercury in coal, drainage of mercury from plants, etc.

In order to counter such problems with chemical substances inside and outside Japan, so that the failure like Minamata disease will not be repeated, we must learn the experience in the past, particularly the history of many victims induced as a consequence of the absence of any particular countermeasures, or the history of efforts to have overcome the failures, and must put the hard experience to practical use as lessons.