SINCE 1990

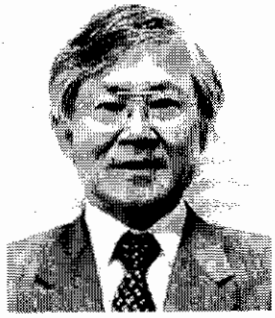
NEWSLETTER

No.35 *This Newsletter is a quarterly publication using recycled paper.* January 2001

THE JAPAN SOCIETY OF WASTE MANAGEMENT EXPERTS

Will Our Life-style and the Society Change?
- New Year Greetings -
JSWME President, Masaru Tanaka

We would like to greet everybody a happy new near!



In the 20th Century, improvements in living conditions have resulted in a healthy, comfortable and convenient lifestyle. Paradoxically, however, this created a society prone to mass production, mass consumption and mass disposal. The amount of waste we generate everyday at home or at work has significantly increased what with economic growth and the increase in disposable products, the latter providing the consumers with convenience thereby increasing consumption and waste generation amount. One essential problem regarding waste is the fact that albeit the absence of any increase in waste generation, the discharge of waste itself continues.

The basic concept of waste treatment is first, to minimize waste generation, second, to recycle waste to minimize waste amount for treatment, third, to recover energy from waste generated along with waste stabilization and waste volume reduction by incineration or other waste treatment techniques, and finally, the landfilling of residues.

In the 21st century, the creation of a closed loop society is desired. A closed loop is a society minimizing waste generation amount by minimizing resource consumption and reducing environmental pollutants. In order to materialize this, we have to improve our level of environmental awareness and implement changes in our lifestyle and the society.

Accordingly, it will be the responsibility of producers from hereon to treat their products after consumption. This responsibility will drive them to design products and select materials that would contribute to the minimization of waste generation. As for the citizens, changes in lifestyle such as changes in purchasing, consumption and discharge patterns will be required, as well as cooperation in the reduction of waste discharge amount and active participation in recycling for natural resource conservation, and involvement in the appropriate treatment of waste. All these will enable the creation of a new society.

In order to assist in the realization of this purpose, JSWME is disseminating useful information by intelligibly explaining the results of researches and studies regarding resource prevention, risk management and cost benefit. For dissemination, the JSWME publishes the Newsletter in English and Journal of Material Cycles and Waste Management.

This year, the Pacific Basin Conference on Hazardous Waste will be held in Okayama from 5 – 7 December and will focus on "Integrated Management for Hazardous Waste – Cleaner Production and Waste Disposal. We are expecting many active participants and presentations.

JSWME is expected by the public to play a more positive role in building a new system in the 21st century.

APLAS FUKUOKA 2000

The Asian Pacific Landfill Symposium Fukuoka 2000 (APLAS Fukuoka 2000) was held in Fukuoka City for 3 days from 11 to 13 October 1999 and was attended by 220 representatives from 14 nations. This symposium was organized in answer to an appeal made during the 7th Annual Conference of the JSWME to the city of Fukuoka regarding the importance of building a continuous partnership with the Asia Pacific Region and a network within the region, to establish an appropriate waste management system in the 21st century. During the symposium, special lectures were carried out by Dr. Masataka Hanashima of Fukuoka University who delivered the keynote address on "World Trend in Solid Waste Management and Current Situation of Landfill Concept", Dr.Raffaello Cossu of the University of Padva on the "Role of Landfilling in the Modem Strategies for Solid Waste Management", Dr. Quan Hao of the China-Japan Friendship Environmental Protection Center on the "Disposal of Municipal Solid Waste in China: Present Situation and Future Concerns", and 32 papers on the design/operation/maintenance of landfill sites, leachate treatment, and environmental preservation and monitoring were published. With all these subjects, the symposium was characterized by lively discussions and exchange of information. On its final day, the topic selected for discussion was: "In pursuit of partnership among the Asian and Pacific countries for responsible solid waste management".

It was also decided that the next symposium and seminar/workshop will be held again in Japan in 2004.

(by Yasushi Matsufuji)

Changes in Incineration Plant Technology

The changes in the technologies involved in waste incineration encompass not only technological advancement but also sociological transformations, serious changes in environmental management policies and changes in waste collection systems. Below is an example of the impacts of these changes in Tokyo.

1. Incineration Prior to and After World War II

In the Taisho Era (1911-1926), urbanization led to the concentration of the population in Tokyo, resulting in waste increase and the very first introduction of the incinerator by the city government due to concerns over sanitation. In 1924, a Katayama-type waste incinerator with a semi-inclined fixed bed furnace and a capacity of 22.5t/10h was constructed in Osaki. With the implementation of further improvements, this facility remained operative until 1944.

In 1929, a solid waste incineration plant (about 940t/d: total incineration capacity of the first, second and third plants) equipped with the most advanced technologies in that period was constructed in Fukagawa, Tokyo. The plant was designed based on the contents and the amount of waste to be treated, air volume for furnace and combustion temperature. Wastes were transported to the facility by ship. Recyclable materials were sorted out prior to incineration (selective incineration), while organic wastes were pulverized by a crushing machine for composting (40t/d). Gauges to measure the incinerated amount as well as the amount of gas emitted by the incineration process were also installed.

In 1932, with the expansion of the municipality of Tokyo from 15 wards to 35 wards, the incineration plants in Oi, Oji, Osaki, Iriarai and Nippori came under the management of the Tokyo municipal government. Prior to this, each plant was respectively managed by the municipality they were located in. Thereafter the first and second incineration plants in Fukagawa and Kamata and the Adachi waste incineration plant were constructed. These developments rapidly made incineration as the main waste treatment measure.

During World War II, waste treatment activities were discontinued. Activities, however, were concentrated again in Tokyo after the war ended. The incineration plants were reopened and several fixed bed stoker type incinerators were constructed. To cope with the increase in waste amount, the development of inland landfills and the reclamation of the Tokyo Bay area for waste disposal were carried out. However, because of the gradual increase in demands for larger incinerators as well as shortage in landfill sites, the focus was again on incineration. The incineration of the entire waste amount at large scale incineration plants became the target, and the furnaces in these plants were developed: from batch type furnaces to continuous type furnaces, small furnaces to large furnaces. Other changes that were gradually implemented also included the construction of a power plant in the incineration plants.

2. Expansion of Furnaces (from batch type furnaces to continuous type furnaces, small furnaces to large furnaces) and Construction of a Power Plant

In 1966, the first full scale continuous type furnace was completed at the Edogawa Plant (referred to as the old Edogawa Plant hereafter to distinguish from the Edogawa Plant currently operating) in Tokyo. In contrast with the batch type furnace, this stoker type furnace had a capacity of 600t/day and could be continuously operated for 24 hrs. Its multiple levels included a large drying level to accommodate the incineration of low quality waste. Two types of stokers were used: the pusher type and the traveling grate stoker. Data was channeled into the central control room but operations were carried out right in front of the furnace. This incineration plant was fully equipped with all the basic accoutrements that make up present day incinerators: pit device and crane, perfectly functioning balanced draft, a churning rod to turn over waste in the incinerator, a device that used the foul odor from the pit to fan the incineration process, gas cooling system (the funnel is sprayed with water), clinker channel for incineration ash, a gauge to monitor incineration conditions, equipment to provide hot water (by the use of waste heat) to the home for the aged facility nearby.

These all led to the determination of the following factors deemed crucial to the design of the incineration plant: waste calorific value, performance curve, furnace capacity, ignition loss.

The Setagaya Incineration Plant constructed in 1969 was the first plant in Tokyo to be equipped with a power plant. Although many incineration plants in Europe were equipped with their own power plants, the Setagaya Incineration Plant was only the second plant (the first being the Nishi-Yodo Incineration Plant in Osaka) with a power plant in Japan.

The introduction of the power plant led to the adoption of new technologies, i.e. boiler and turbine technologies, which consequently reshaped the role, in terms of services, of the incineration plant in the Japanese society. Although a steady supply of electricity could not be relied on at first, the importance of power for waste treatment intensified in time as services improved and due to renewed focus given to the development of local energy as a countermeasure against the problems brought on by the worldwide oil crisis.

All these led to the supply of energy to the Tokyo Electric Power Company in 1975 and eventually the sale of energy the following year.

3. Impacts of Changes in Waste Collection System, Waste Quality and Waste Calorific Value

The use of the batch type furnace before World War II and the dawn of the age of incineration propelled experts toward studies and research to determine waste quality and the appropriate temperature for incineration – factors considered key to the development of countermeasures against potential technical problems, e.g. soot and smoke, in waste incineration.

The separate collection of kitchen waste and miscellaneous waste started in 1931. Waste incineration plants only incinerated miscellaneous waste with high calorific value until 1955 when the separate collection was terminated.

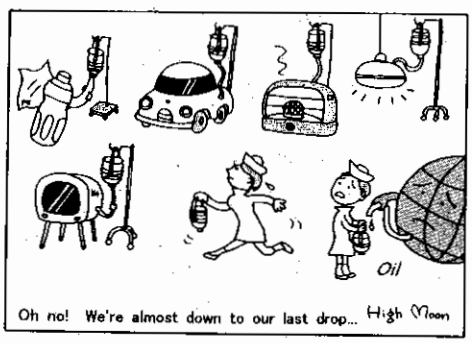
The termination of the separate collection of these two waste types started in 1955 and ended in 1964 as a result of the development of sanitary treatment measures and the focus on efficient collection. During this period, mixed collection was adopted. This collection system, however, lowered the waste calorific value and made combustion difficult.

The introduction of waste calorific value as a factor to consider in designing the incinerator was based on the report made in 1963 by the Cleansing Screening Committee of the Tokyo Metropolitan Government. The old Kita Incineration Plant and the old Edogawa Incineration Plant were designed based on a maximum waste calorific value of 1,200Kcal. At that time, incinerator designs were carried out elaborately, making sure that the facility is equipped with a wide stoker for drying to also accommodate waste high in moisture content.

The latter half of the 1970s, however, witnessed a complete turnabout – the waste calorific value increased. The waste calorific value set for the incineration plant design was 1,500 Kcal/kg for the Setagaya Incineration Plant, 1,800 Kcal/kg for the Oi Incineration Plant in 1973, 2,500 Kcal/kg for the Katsushika Incineration Plant in 1977, and 2,900 Kcal/kg for the Kita Incineration Plant in 1998.

The increase in waste generation amount and waste calorific value led to demands for larger incinerators and furnaces. And because these, in turn, would result in increased emission of exhaust gas, the scale of the plant becomes bigger as anti-pollution devices with bigger capacities become necessary. The increased utilization of heat in the plant promoted heat utilization. Moreover, the demand for the use of heat recovered also led to the construction of incineration plants with large power generation capacity and the provision of localized air conditioning systems. *To be continued.*

(by Akio Ishii)



Note : Until when can we continue receiving oil?
By courtesy of Prof. Hiroshi Takatsuki (Taka-tsuki literally means "High Moon".)
(translated by JSWME, taken from Monthly "The Waste", November 2000)

The Tokyo Metropolitan Research Institute for Environmental Protection (TRIEP)

The Tokyo Metropolitan Research Institute for Environmental Protection (TRIEP) operated by Tokyo Metropolitan Government (TMG) was founded as to gather scientific information essential to the reliable and appropriate administration of environmental conditions in the Tokyo metropolitan area.

TRIEP was first established as a "Research Institute for Pollution Control" in 1968, when pollution problems, e.g. air and water pollution, etc., in the city intensified. The research activities of the institute focused on the actual state of pollution and impacts on public health, and anti-pollution techniques. For the prevention of pollution, the institute also carried out sociological surveys, as well as gathered and provided relevant information and materials.

In 1985, the institute moved to its present address in Koto-ku, Tokyo, and was renamed. At this time, pollution problems had progressed from being regional in scale (pollution by factories) to being widespread – urban and domestic in nature (both as culprits and victims of pollution at the same time). The issues covered by environmental management have also significantly grown in scale, from the treatment of destructive pollution problems to pollution prevention and natural environmental protection.

The institute is doing its best to remain flexible in order to accurately cope with the changing nature of environmental problems. At present, it is made up of 1 section, 3 departments and 1 research laboratory: Planning/Management Section, Basic Research Department, Applied Research Department, Analysis/Research Department, Waste Research Laboratory. It carries out sociological researches on energy saving measures in a complex, surveys on actual conditions and forecast environmental pollution such as hazardous chemical substances and endocrine disrupters, researches on pollution mechanism and environmental improvement measures e.g. automotive emissions and groundwater contamination, surveys on the global environment, analytical techniques improvement for environmental analysis, and then surveys and researches relevant to waste treatment and resource recovery. The results of surveys and researches are indicated in the institute's annual reports. In addition, the institute publishes quarterly newsletter, and has its own web site in English.

TRIEP

From 2000, TMG' public cleansing services has been moved under each ward's jurisdiction. Then Public Cleansing Bureau and the Environmental Protection Bureau merged to form the Bureau of Environment, and this led to the incorporation of the former Cleansing Bureau's Research Institute for Public Cleansing (TRIPC), as the Waste Research Laboratory, into the TRIEP. TRIPC was established in 1960 as a unique research institute specializing on waste. (The Tokyo Metropolitan Research Institute for Public Cleansing was introduced in the Newsletter No. 9 issue.) Although the institute has been carrying out surveys and research work in accordance with the changes in the cleansing services issues incurred by time, for reinforcement, researches focusing on appropriate industrial and hazardous waste treatment and the formation of a closed-loop society will be incorporated into the environmental research activities in the future.

Contact Person:	Hideo Azuma, Assistant Director, or Dr. Takeo Urabe
Address:	Shinsuna, 1-7-5, Koto-ku, Tokyo (headquarters) Aomi, 2-chisaki, Koto-ku, Tokyo (Waste Research Laboratory)
Phone:	(+81)3-3699-1331
Fax:	(+81)3-3699-1345
Website:	http://www.kankyoken.koto.tokyo.jp

JSWME's 11th Research Conference and the International Session

The JSWME held its annual research conference on November 8-10 in Sapporo, and it was the first time the conference was held in Hokkaido, the northern island of Japan. The number of research papers presented during the conference was 416 and the participants totalled 1,429.

The International Session was held in November 9, in English, and attracted 147 attendants. This International Session was the eighth English session held cooperatively by the JSWME and the Korea Solid Wastes Engineering Society (KSWES). This time, the session was divided into four sub-sessions: 1) Waste Management Planning, Waste Generation, Recycling(5 papers); 2) Landfill, Leachate Treatment (5 papers); 3) Dioxins, Incineration, Thermal Treatment (5 papers); and 4) Hazardous Waste, Various Treatment (6 papers). Each sub-session was co-chaired by a Japanese and a Korean chairperson. Of the 21 papers, nine were by the JSWME members and the remaining twelve were by the KSWES members.

In May 2001, the two societies will hold their ninth English Session in Korea. For those interested in attending the session, please contact either the JSWME or the KSWES secretariat. We are also looking forward to meeting you in the tenth session which will be held in Yokohama, Japan, in late October 2001.

(by Ryoko Sugiyama)

Journal of the Japan Society of Waste Management Experts, Vol. 11, No.6 (November 2000)

Recent issues of the Journal of JSWME contain the following articles. The articles are written in Japanese with the abstract in English.

《Vol. 11, No.6 (November 2000)》

Paper

Mass Flow of Dioxins in a Landfill Site Disposed of Municipal Solid Waste Incinerator Ash
Yukio Noma, Yasushi Matsufuji, Mitsuyasu Takata and Keijiro Tomoda

Removal of Dioxins in Flue Gas from Waste Incinerators by Catalytic Oxidative Process
Ichiro Ninomiya, Kazue Ueda, Kazumasa Tanaka, Masanobu jigo, Hirotaka Amimoto and Kazuo Tai

Verification of Recycling Rate of Food and Beverage Containers Using Material Flow Analysis
Atsushi Terazono, Suehiro Otoma and Yasuhumi Mori

Methods for Identifying Used Home Electric Appliances in a Recycling System
Toshiyuki Aoki, Yuko Okada, Masakatsu Hayashi, Koji Tagusari, and Takeo Takagi

Application of X-ray Fluorescence Analysis to Determination of Elements in Fly Ash
Masaki Takaoka, Daisuke Nakatsuka, Nobuo Takeda and Takashi Fujiwara

Prediction of the Volume of Waste Concrete from Demolished Highway Bridges and the Effect of Life-lengthening on Reduction in the Volume of Waste Concrete in Miyazaki Prefecture
Yutaka Dote, Toshiro Maruyama and Kumiko Okada

Current Members of JSWME	As of 30 November 2000 (value in parenthesis is the difference from 1 October 2000)
Regular Members	3,514 (59)
Students	263 (43)
Non-Japanese Members	21 (0)
Public Institutions	113 (0)
Supporting Members	207 (3)
Total	4,118 (105)

NEWSLETTER NO.35
Published by
Prof. Masaru Tanaka, President,
The Japan Society of Waste Management Experts
Edited by
Prof. Isamu Yokota, Chairman,
International Relations Committee
Buzen-ya Bldg. Shiba 5-1-9, Minato-ku,
Tokyo 108-0014, Japan
Phone (+ 81) 3-3769-5099
Fax. (+ 81) 3-3769-1492
http://wwwsoc.nacsis.ac.jp/jswme/index.html
January, 2001