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RADIOACTIVITY SURVEY DATA in Japan

Part 1
= Environmental Materials =

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Contents

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Environmental and Dietary Materials*

(Japan Chemical Analysis Center)

1. Collection and pretreatment of samples

(1) Rain and dry fallout

Rain and dry fallout was collected monthly on a sampling tray, approximately 5000cm^2 in area, which was filled with water to a depth of 1 cm at the beginning of every month.

Strontium and cesium carrier solutions were added after the sample was filtered. The tray was washed with 5ℓ of distilled water and the washing was combined to the filtrate.

The sample was passed through a cation exchange column (500mℓ of Dowex 50W X8, 50~100 mesh, Na form) at a rate flow of 80mℓ/min.

(2) Airborne dust

Airborne dust was collected by an electrostatic precipitator or a filter air sampler for every three-months at a rate of more than 3000m^3 per month.

The sampling was done 1 to 1.5 meters above the ground.

(3) Service water and freshwater

Service water, 100ℓ each, was collected at the intake of the water-treatment plant and at the tap after water was left running for five minutes. Strontium and cesium carriers were added to the filtered water sample. The subsequent process was the same as that described in the section (1). Freshwater was treated in the same way as the service water.

(4) Soil

Soil was collected from the location in the spacious and flat area without past surface disturbance caused by dust storms, inflow and out flow due to precipitation, etc.. Any places located under trees in a forest, in a stony area or inside of river banks were avoided. Soil was taken from two layers of different depths, 0-5cm and 5-20cm. The soil lumps were crushed by hands and dried in a drying oven regulated 105℃. The soil was then passed through a 2mm sieve to remove plant roots and pebbles.

(5) Sea water

Sea water was collected at the fixed stations where the effect of terrestrial fresh water from rivers was expected to be negligibly small. A special consideration was also given to weather conditions.

The sampling was carried out when there was no rainfall for the last few days. To prevent contamination, water samples were collected at the bow of a sampling boat just before she stood still by scooping surface water using a polyethylene bucket.

Immediately after the collection, the samples were acidified to a pH lower than 3 by adding concentrated hydrochloric acid in a ratio of 1mℓ to 1ℓ of sea water, and then stored in 20ℓ polyethylene containers. The sampling equipments as well as containers were thoroughly rinsed with dilute hydrochloric acid and then with distilled water before use. Two hundred milliliters of sea water was also collected at the same stations for the determination of chlorinity.

(6) Sea sediments

Sediment was collected in the same area as that for the sea water sample, taking the following criteria into account:

a. The depth of water exceeds 1m at low tide.
b. No significant sedimental movement is observed in the vicinity of concern.
c. Mud, silt and fine sand are preferable.

A conventional sediment sampling device was used for collecting the top few centimeters of surface sediment. Approximately 4kg of the sample in wet weight was spread on a stainless steel dish after removed of the pebbles, shells and other foreign materials, and dried in a drying oven regulated at 105℃.

(7) Total diet

A full one day ordinary diet including three meals, water, tea and other in-between snacks for five persons was collected as a sample of "total diet".

The sample in a large stainless steel pan was carbonized carefully by direct application of gas flame, and was transferred to a porcelain dish and then ashed at 450℃ in an electric muffle furnace.

(8) Rice

Polished rice was collected in producing districts at the harvest and in consuming areas when new crops were first put on sale. The sample was carbonized and ashed in a porcelain dish.

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* Samples were sent to the Center from 46 contracted prefectures.

(9) Milk

Raw milk was collected in producing districts and commercial milk was purchased in consuming districts. Milk in a stainless steel pan or a porcelain dish was evaporated to dryness followed by carbonization and ashing.

(10) Vegetables

Spinach and Japanese radish were selected as the representatives for left vegetables and for nonstarch roots, respectively. After removing soil, the edible part of vegetable sample was dried and carbonized in a stainless steel pan or a porcelain dish.

(11) Tea

Five hundred grams of manufactured green tea was collected, carbonized and ashed in a stainless steel pan or a porcelain dish.

(12) Fish, shellfish and seaweeds

a. Sea fish and freshwater fish

Fish was rinsed with water and blotted with a filter paper. Only the edible part was used in case of larger sized fish, and the whole part was used in case of smaller ones. Each sample was weighed and placed in a stainless steel pan or a porcelain dish. After carbonized, the sample was ashed in an electric muffle furnace.

b. Shellfish

Approximately 4kg of shellfish including the shells was collected or purchased. After removing the shells, it was treated in the same way as that for the sea fish.

c. Seaweeds

Edible seaweeds were collected and rinsed with water to remove sand and other adhering matters on the surface. These were removed of excess water, weighed dried and ashed.

Table 1 shows details of sample collection.

Table 1 Details of sample collection

Sample	Frequency of sampling	Quantity of sample
=Environmental materials=		
(1) Rain and dry fallout		
1. For domestic program	monthly	
2. For WHO program	monthly	
(2) Airborne dust	quarterly	>3000 m^3/month
(3) Service water and freshwater		
1. Service water (source water)	semiyearly	100 ℓ
2. Service water (tap water)	semiyearly	100 ℓ
3. Freshwater	yearly (fishing season)	100 ℓ
(4) Soil		
1. 0～ 5 cm	yearly	4 kg
2. 5～ 20cm	yearly	4 kg
(5) Sea water	yearly	40 ℓ
(6) Sea sediments	yearly	4 kg
=Dietary materials=		
(7) Total diet	semiyearly	daily amount for 5 persons
(8) Rice		
1. Producing districts	yearly (harvesting season)	5 kg (polished rice)
2. Consuming districts	yearly (harvesting season)	5 kg (polished rice)
(9) Milk		
1. Producing districts for WHO program	quarterly (February, May, August and November)	3 ℓ
2. Producing districts for domestic program	semiyearly (February and August)	3 ℓ

Sample	Frequency of sampling	Quantity of sample
3. Consuming districts	semiyearly (February and August)	3 ℓ
4. Powdered milk	semiyearly (April and October)	2～ 3 kg
(10) Vegetables		
1. Producing districts	yearly (harvesting season)	4 kg
2. Consuming districts	yearly (harvesting season)	4 kg
(11) Tea	yearly (the first harvesting season)	500g (manufactured tea)
(12) Fish, shellfish and seaweeds		
1. Sea fish	yearly (fishing season)	4 kg
2. Freshwater fish	yearly (fishing season)	4 kg
3. Shellfish	yearly (fishing season)	4 kg
4. Seaweeds	yearly (fishing season)	2～ 3 kg

2. Preparation of samples for analysis

(1) Rain, service water and freshwater

Strontium and cesium were eluted with hydrochloric acid from the cation exchange column. The residue of rain sample on the filter paper was ashed in an electric muffle furnace and the ash was dissolved in hydrochloric acid. The insoluble part was filtered and washed. The filtrate and the washings were combined to the previous eluate and used for radiochemical analysis.

(2) Soil and Sea sediment

Dried soil was crushed to smaller ones than 0.25mm in size by a crusher. The sieved sample was ashed in an electric muffle furnace regulated at 450 ℃. The sample was then heated with hydrochloric acid, strontium and cesium carrier solutions and the mixture was heated. The insoluble constituent was filtered off and washed with water.

The dried sample was crushed to smaller ones than 0.25mm by a crushing machine. The further preparation of the sample was the same as that described in the section 2-(2).

(3) Rice

The ashed sample was pulverized with a porcelain mortar and passed through a 0.35mm sieve. The sieved sample to which both strontium and cesium carriers were added, was digested with nitric acid by heating. After the sample was heated again with nitric acid to dryness, strontium and cesium were extracted with hydrochloric acid and water. The insoluble constituent was filtered and washed. The filtrate and washings were combined for subsequent radiochemical analysis.

(4) Airborne dust, diet, milk, vegetables, fish and shellfish, seaweeds, tea and others

These ashed samples were treated with the same procedure as that described in the section 2-(4).

3. Separation of strontium-90 and cesium-137

(1) Strontium-90

Sample solutions, prepared as in the foregoing sections 2-(1) through 2-(4), were neutralized with sodium hydroxide. After sodium carbonate was added, the precipitate of strontium and calcium carbonates was separated. The supernatant solution was retained for cesium-137 determination.

The carbonates were dissolved in hydrochloric acid and strontium and calcium were precipitated as oxalates. The precipitate was dissolved in nitric acid and strontium was separated from calcium by successive fuming nitric acid separation. Iron scavenge was made after addition of ferric iron carrier followed by barium chromate separation after addition of barium carrier to remove radium, its daughters and lead. Strontium was recovered as carbonate, and the precipitate was dried and weighed to determine strontium recovery. The strontium carbonate was dissolved in hydrochloric acid and iron carrier was added. The solution was allowed to stand for two weeks for strontium-90 and yttrium-90 to attain equilibrium. Yttrium-90 was coprecipitated with ferric hydroxide and the precipitate was filtered off, washed and counted.

(2) Cesium-137

The supernatant separated from the strontium fraction was acidified with hydrochloric acid. While stirring, cesium was adsorbed on the ammonium molybdophosphate added.

After filtered off and washed with hydrochloric acid the precipitate was dissolved in 2.5N sodium hydroxide solution. The solution was adjusted to pH 8.2 with hydrochloric acid and allowed to cool.

Resultant molybdenum hydroxide which separated

out in the solution, was filtered off and washed with water. EDTA was added to the filtrate and washings. Cesium and rubidium were adsorbed on a cation exchange column and cesium was separated from rubidium by eluting with hydrochloric acid.

The eluate was evaporated to dryness and was dissolved. The solution was filtered.
Chloroplatinic acid was added to precipitate cesium. The precipitate was filtered onto a tared paper using a demountable filter and washed with water and then ethanol. After drying, the chemical yield of cesium was determined by weighing the precipitate. Cesium-137 radioactivity was measured for this precipitate.

4. Determination of stable strontium, calcium and potassium

A weighed amount of soil or sea sediment was heated in a electric muffle furnace at 450℃ and then treated with hydrochloric acid for extraction.
A weighed aliquot of ashed samples of total diet, vegetables, milk, fish, shellfish or seaweeds was digested with hydrofluoric acid and nitric acid.
The extract was made up to an appropriate volume with dilute hydrochloric acid. The sample solution was analyzed for calcium by titration with standard potassium permanganate solution after separating calcium as oxalate. Atomic absorption spectroscopy was applied when appropriate. Stable strontium and potassium were determined by atomic absorption and flame emission spectrometry, respectively.

5. Counting

After the radiochemical separation the mounted precipitates were counted for activity using low background beta counters normally for 60 to 90min. Net sample counting rates were corrected for counter efficiency, recovery, self-absorption and decay to obtain the content of strontium-90 and cesium-137per sample aliquot. From the results, concentrations of these nuclides in the original samples were calculated.

6. Results

(1)-1 Strontuim-90 and Cesium-137 in Rain and Dry Fallout (for domestic program) (from Oct. 1995 to Mar. 1996)

-continued from No, 114 of this publication-

Table (1)-1 : Strontium-90 and Cesium-137 in Rain and Dry Fallout

Location	Duration (days)	Precipitation (mm)	^{90}Sr (MBq/km^2)	^{137}Cs (MBq/km^2)
October, 1995				
Sapporo, HOKKAIDOU	31	119.0	0.008 ± 0.012	0.042 ± 0.019
Aomori, AOMORI	30	108.5	0.018 ± 0.012	0.011 ± 0.017
Morioka, IWATE	31	52.4	0.018 ± 0.015	0.000 ± 0.011
Onagawa-machi, MIYAGI	32	32.0	0.000 ± 0.011	0.008 ± 0.011
Yamagata, YAMAGATA	31	27.7	0.007 ± 0.013	0.010 ± 0.016
Ookuma-machi, FUKUSHIMA	31	35.5	0.023 ± 0.0071	0.007 ± 0.017
Mito, IBARAKI	31	65.0	0.0055 ± 0.0068	0.016 ± 0.016
Utsunomiya, TOCHIGI	31	68.6	0.012 ± 0.0077	0.000 ± 0.013
Maebashi, GUNMA	31	55.5	0.0000 ± 0.0068	0.020 ± 0.012
Urawa, SAITAMA	31	85.7	0.027 ± 0.0070	0.043 ± 0.015
Ichihara, CHIBA	31	115.8	0.0049 ± 0.0076	0.010 ± 0.013
Shinjuku, TOKYO	31	33.1	0.0077 ± 0.0074	0.014 ± 0.012
Yokohama, KANAGAWA	31	44.6	0.030 ± 0.0081	0.016 ± 0.017
Kosugi-machi, TOYAMA	31	66.9	0.021 ± 0.014	0.000 ± 0.015
Fukui, FUKUI	31	67.2	0.000 ± 0.052	0.17 ± 0.091
Koufu, YAMANASHI	31	79.0	0.025 ± 0.012	0.000 ± 0.014
Gifu, GIFU	31	48.5	0.000 ± 0.014	0.000 ± 0.018
Shizuoka, SHIZUOKA	31	108.0	0.0049 ± 0.0070	0.008 ± 0.012
Nagoya, AICHI	32	87.1	0.019 ± 0.0084	0.014 ± 0.014
Ootsu, SHIGA	31	86.6	0.008 ± 0.011	0.022 ± 0.016
Tsu, MIE	31	41.0	0.021 ± 0.012	0.000 ± 0.016
Kyoto, KYOTO	32	84.5	0.020 ± 0.0088	0.000 ± 0.016
Kobe, HYOUGO	33	81.6	0.0044 ± 0.0089	0.043 ± 0.014
Nara, NARA	31	113.5	0.036 ± 0.016	0.025 ± 0.016
Wakayama, WAKAYAMA	31	93.5	0.0087 ± 0.0050	0.000 ± 0.017
Tottori, TOTTORI	31	45.9	0.12 ± 0.014	0.026 ± 0.013

Location	Duration (days)	Precipitation (mm)	^{90}Sr (MBq/km²)	^{137}Cs (MBq/km²)
Matsue, SHIMANE	31	43.7	0.024 ± 0.0067	0.031 ± 0.010
Hiroshima, HIROSHIMA	31	96.2	0.062 ± 0.019	0.000 ± 0.011
Ishii-machi, TOKUSHIMA	36	76.5	0.054 ± 0.0095	0.030 ± 0.014
Takamatsu, KAGAWA	34	62.5	0.020 ± 0.013	0.000 ± 0.015
Matsuyama, EHIME	31	133.5	0.021 ± 0.0081	0.000 ± 0.010
Dazaifu, FUKUOKA	31	52.8	0.012 ± 0.0070	0.015 ± 0.013
Saga, SAGA	31	36.8	0.0012 ± 0.0074	0.009 ± 0.011
Nagasaki, NAGASAKI	31	36.5	0.020 ± 0.0092	0.000 ± 0.011
Uto, KUMAMOTO	31	94.0	0.018 ± 0.0089	0.002 ± 0.014
Ooita, OOITA	31	43.6	0.009 ± 0.010	0.015 ± 0.016
Miyazaki, MIYAZAKI	31	327.5	0.0000 ± 0.0066	0.027 ± 0.018
Yonagusuku-mura, Okinawa	30	120.0	0.013 ± 0.0073	0.014 ± 0.018
November, 1995				
Sapporo, HOKKAIDOU	31	110.5	0.016 ± 0.0079	0.0000 ± 0.0099
Aomori, AOMORI	31	114.0	0.014 ± 0.015	0.000 ± 0.016
Morioka, IWATE	31	70.0	0.000 ± 0.012	0.008 ± 0.011
Onagawa-machi, MIYAGI	33	47.0	0.025 ± 0.014	0.002 ± 0.011
Yamagata, YAMAGATA	31	102.0	0.018 ± 0.0074	0.035 ± 0.016
Ookuma-machi, FUKUSHIMA	31	44.5	0.033 ± 0.0093	0.037 ± 0.017
Mito, IBARAKI	31	39.5	0.011 ± 0.0075	0.037 ± 0.016
Utsunomiya, TOCHIGI	31	39.3	0.015 ± 0.0066	0.000 ± 0.016
Maebashi, GUNMA	31	11.0	0.0057 ± 0.0079	0.053 ± 0.015
Urawa, SAITAMA	31	25.8	0.030 ± 0.0073	0.033 ± 0.012
Ichihara, CHIBA	31	62.8	0.011 ± 0.0084	0.000 ± 0.011
Shinjuku, TOKYO	31	55.2	0.012 ± 0.0088	0.016 ± 0.012
Yokohama, KANAGAWA	31	70.4	0.037 ± 0.0092	0.026 ± 0.017
Kosugi-machi, TOYAMA	31	287.8	0.006 ± 0.011	0.000 ± 0.015

Location	Duration (days)	Precipitation (mm)	^{90}Sr (MBq/km²)	^{137}Cs (MBq/km²)
Fukui, FUKUI	34	334.0	0.12 ± 0.060	0.000 ± 0.065
Koufu, YAMANASHI	31	31.0	0.015 ± 0.010	0.007 ± 0.015
Gifu, GIFU	31	71.0	0.0000 ± 0.0090	0.0000 ± 0.0099
Shizuoka, SHIZUOKA	31	112.5	0.013 ± 0.0077	0.009 ± 0.011
Nagoya, AICHI	34	64.2	0.0015 ± 0.0092	0.016 ± 0.014
Ootsu, SHIGA	31	58.5	0.011 ± 0.016	0.005 ± 0.012
Tsu, MIE	31	27.5	0.0049 ± 0.0082	0.0000 ± 0.0093
Kyoto, KYOTO	29	53.0	0.011 ± 0.0088	0.017 ± 0.017
Kobe, HYOUGO	31	40.3	0.018 ± 0.0075	0.011 ± 0.013
Nara, NARA	31	84.6	0.040 ± 0.016	0.031 ± 0.014
Wakayama, WAKAYAMA	31	44.5	0.0055 ± 0.0083	0.000 ± 0.016
Tottori, TOTTORI	31	122.5	0.075 ± 0.011	0.041 ± 0.014
Matsue, SHIMANE	31	114.9	0.021 ± 0.0063	0.025 ± 0.013
Hiroshima, HIROSHIMA	31	19.4	0.065 ± 0.017	0.004 ± 0.013
Ishii-machi, TOKUSHIMA	34	28.5	0.023 ± 0.0080	0.001 ± 0.011
Takamatsu, KAGAWA	31	15.0	0.014 ± 0.010	0.027 ± 0.012
Matsuyama, EHIME	31	56.0	0.014 ± 0.0072	0.000 ± 0.016
Dazaifu, FUKUOKA	31	51.0	0.0072 ± 0.0065	0.001 ± 0.012
Saga, SAGA	31	40.4	0.000 ± 0.012	0.004 ± 0.011
Nagasaki, NAGASAKI	31	42.5	0.025 ± 0.0088	0.000 ± 0.010
Uto, KUMAMOTO	31	67.2	0.013 ± 0.0069	0.001 ± 0.012
Ooita, OOITA	31	13.9	0.0047 ± 0.0069	0.0000 ± 0.0097
Miyazaki, MIYAZAKI	31	31.1	0.0011 ± 0.0063	0.019 ± 0.016
Yonagusuku-mura, Okinawa	31	60.0	0.0000 ± 0.0079	0.026 ± 0.018
December, 1995				
Sapporo, HOKKAIDOU	28	120.5	0.013 ± 0.0075	0.053 ± 0.019
Aomori, AOMORI	35	93.0	0.028 ± 0.013	0.014 ± 0.017

Location	Duration (days)	Precipitation (mm)	^{90}Sr (MBq/km²)	^{137}Cs (MBq/km²)
Morioka, IWATE	35	38.1	0.0085 ± 0.0084	0.025 ± 0.014
Onagawa-machi, MIYAGI	33	6.5	0.000 ± 0.013	0.022 ± 0.014
Yamagata, YAMAGATA	35	88.5	0.011 ± 0.0076	0.010 ± 0.019
Ookuma-machi, FUKUSHIMA	35	2.0	0.0000 ± 0.0061	0.009 ± 0.012
Mito, IBARAKI	36	0.0	0.012 ± 0.0099	0.000 ± 0.018
Utsunomiya, TOCHIGI	35	3.7	0.011 ± 0.0075	0.009 ± 0.010
Maebashi, GUNMA	36	0.0	0.013 ± 0.0082	0.051 ± 0.014
Urawa, SAITAMA	35	0.0	0.039 ± 0.0086	0.060 ± 0.014
Ichihara, CHIBA	35	0.0	0.019 ± 0.0083	0.046 ± 0.015
Shinjuku, TOKYO	35	0.0	0.0096 ± 0.0088	0.000 ± 0.011
Yokohama, KANAGAWA	35	0.0	0.020 ± 0.0081	0.094 ± 0.019
Kosugi-machi, TOYAMA	35	287.7	0.001 ± 0.011	0.020 ± 0.017
Fukui, FUKUI	32	352.4	0.000 ± 0.049	0.000 ± 0.079
Koufu, YAMANASHI	35	0.0	0.029 ± 0.012	0.000 ± 0.018
Gifu, GIFU	35	9.0	0.033 ± 0.010	0.000 ± 0.012
Shizuoka, SHIZUOKA	36	6.5	0.000 ± 0.012	0.048 ± 0.015
Nagoya, AICHI	32	0.0	0.000 ± 0.010	0.000 ± 0.015
Ootsu, SHIGA	35	19.5	0.029 ± 0.0088	0.014 ± 0.016
Tsu, MIE	35	7.0	0.000 ± 0.014	0.025 ± 0.014
Kyoto, KYOTO	31	5.5	0.015 ± 0.0082	0.000 ± 0.014
Kobe, HYOUGO	29	1.8	0.021 ± 0.0073	0.021 ± 0.015
Nara, NARA	36	5.0	0.047 ± 0.016	0.004 ± 0.017
Wakayama, WAKAYAMA	39	21.5	0.0049 ± 0.0087	0.017 ± 0.012
Tottori, TOTTORI	36	274.3	0.057 ± 0.010	0.076 ± 0.016
Matsue, SHIMANE	36	170.6	0.015 ± 0.0065	0.039 ± 0.013
Hiroshima, HIROSHIMA	35	16.0	0.18 ± 0.018	0.002 ± 0.011
Ishii-machi, TOKUSHIMA	33	7.5	0.013 ± 0.0067	0.031 ± 0.015

Location	Duration (days)	Precipitation (mm)	^{90}Sr (MBq/km²)	^{137}Cs (MBq/km²)
Takamatsu, KAGAWA	28	2.0	0.028 ± 0.011	0.011 ± 0.011
Matsuyama, EHIME	35	3.5	0.012 ± 0.0070	0.008 ± 0.016
Dazaifu, FUKUOKA	35	16.4	0.011 ± 0.0073	0.000 ± 0.015
Saga, SAGA	35	3.6	0.012 ± 0.0068	0.000 ± 0.014
Nagasaki, NAGASAKI	35	9.5	0.012 ± 0.0096	0.007 ± 0.013
Uto, KUMAMOTO	35	0.0	0.0000 ± 0.0095	0.0000 ± 0.0098
Ooita, OOITA	35	0.0	0.0000 ± 0.0092	0.021 ± 0.012
Miyazaki, MIYAZAKI	35	1.6	0.016 ± 0.0070	0.065 ± 0.019
Yonagusuku-mura, Okinawa	37	23.5	0.0000 ± 0.0074	0.000 ± 0.019
January, 1996				
Sapporo, HOKKAIDOU	36	86.5	0.000 ± 0.011	0.002 ± 0.011
Aomori, AOMORI	28	89.0	0.011 ± 0.012	0.010 ± 0.017
Morioka, IWATE	29	32.0	0.0000 ± 0.0075	0.001 ± 0.012
Onagawa-machi, MIYAGI	29	13.0	0.013 ± 0.013	0.010 ± 0.016
Yamagata, YAMAGATA	29	68.0	0.000 ± 0.012	0.016 ± 0.012
Ookuma-machi, FUKUSHIMA	29	9.5	0.036 ± 0.015	0.052 ± 0.014
Mito, IBARAKI	28	21.0	0.001 ± 0.011	0.053 ± 0.021
Utsunomiya, TOCHIGI	29	9.4	0.015 ± 0.0078	0.050 ± 0.014
Maebashi, GUNMA	28	25.5	0.014 ± 0.0079	0.017 ± 0.012
Urawa, SAITAMA	29	7.8	0.024 ± 0.0073	0.033 ± 0.011
Ichihara, CHIBA	29	38.4	0.010 ± 0.0066	0.021 ± 0.014
Shinjuku, TOKYO	29	18.3	0.022 ± 0.0092	0.023 ± 0.018
Yokohama, KANAGAWA	28	23.6	0.023 ± 0.0084	0.013 ± 0.017
Kosugi-machi, TOYAMA	29	192.0	0.022 ± 0.013	0.009 ± 0.026
Fukui, FUKUI	29	227.3	0.000 ± 0.057	0.060 ± 0.060
Koufu, YAMANASHI	29	13.0	0.015 ± 0.0074	0.017 ± 0.018
Gifu, GIFU	29	82.0	0.003 ± 0.013	0.000 ± 0.015

Location	Duration (days)	Precipitation (mm)	^{90}Sr (MBq/km²)	^{137}Cs (MBq/km²)
Shizuoka, SHIZUOKA	28	59.0	0.003 ± 0.013	0.000 ± 0.013
Nagoya, AICHI	28	33.4	0.050 ± 0.016	0.032 ± 0.019
Ootsu, SHIGA	29	52.9	0.0097 ± 0.0070	0.000 ± 0.014
Tsu, MIE	29	16.0	0.0000 ± 0.0067	0.034 ± 0.014
Kyoto, KYOTO	35	48.0	0.017 ± 0.0088	0.061 ± 0.018
Kobe, HYOUGO	35	30.0	0.015 ± 0.0084	0.032 ± 0.014
Nara, NARA	28	63.4	0.028 ± 0.016	0.000 ± 0.019
Wakayama, WAKAYAMA	26	21.0	0.0000 ± 0.0080	0.022 ± 0.012
Tottori, TOTTORI	28	148.4	0.057 ± 0.016	0.091 ± 0.020
Matsue, SHIMANE	28	88.4	0.020 ± 0.0067	0.078 ± 0.015
Hiroshima, HIROSHIMA	29	38.0	0.064 ± 0.012	0.020 ± 0.012
Ishii-machi, TOKUSHIMA	28	11.0	0.0097 ± 0.0069	0.006 ± 0.012
Takamatsu, KAGAWA	36	25.5	0.030 ± 0.0087	0.009 ± 0.010
Matsuyama, EHIME	29	43.0	0.0068 ± 0.0068	0.041 ± 0.019
Dazaifu, FUKUOKA	29	44.8	0.0074 ± 0.0075	0.011 ± 0.010
Saga, SAGA	29	45.2	0.017 ± 0.0071	0.000 ± 0.016
Nagasaki, NAGASAKI	29	44.5	0.037 ± 0.016	0.027 ± 0.020
Uto, KUMAMOTO	29	87.4	0.0078 ± 0.0076	0.0055 ± 0.0099
Ooita, OOITA	29	14.4	0.0024 ± 0.0078	0.014 ± 0.011
Miyazaki, MIYAZAKI	29	60.5	0.031 ± 0.0086	0.11 ± 0.021
Yonagusuku-mura, Okinawa	27	50.0	0.0069 ± 0.0095	0.010 ± 0.014
Febraly, 1996				
Sapporo, HOKKAIDOU	30	54.5	0.0000 ± 0.0092	0.015 ± 0.011
Aomori, AOMORI	30	111.0	0.013 ± 0.012	0.016 ± 0.016
Morioka, IWATE	30	27.2	0.0092 ± 0.0085	0.006 ± 0.011
Onagawa-machi, MIYAGI	29	11.0	0.009 ± 0.012	0.015 ± 0.017
Yamagata, YAMAGATA	30	46.4	0.023 ± 0.0088	0.000 ± 0.011

Location	Duration (days)	Precipitation (mm)	^{90}Sr (MBq/km²)	^{137}Cs (MBq/km²)
Ookuma-machi, FUKUSHIMA	30	14.0	0.0064 ± 0.0073	0.044 ± 0.014
Mito, IBARAKI	30	32.0	0.013 ± 0.014	0.10 ± 0.023
Utsunomiya, TOCHIGI	30	33.6	0.023 ± 0.0085	0.055 ± 0.015
Maebashi, GUNMA	30	17.0	0.000 ± 0.015	0.012 ± 0.017
Urawa, SAITAMA	30	40.0	0.0000 ± 0.0094	0.046 ± 0.012
Ichihara, CHIBA	30	63.0	0.015 ± 0.0070	0.021 ± 0.014
Shinjuku, TOKYO	30	62.4	0.023 ± 0.0088	0.031 ± 0.018
Yokohama, KANAGAWA	30	62.1	0.027 ± 0.0088	0.051 ± 0.015
Kosugi-machi, TOYAMA	30	95.6	0.000 ± 0.011	0.016 ± 0.017
Fukui, FUKUI	30	173.4	0.007 ± 0.036	0.030 ± 0.058
Koufu, YAMANASHI	30	45.5	0.0076 ± 0.0069	0.019 ± 0.016
Gifu, GIFU	30	62.0	0.009 ± 0.013	0.000 ± 0.027
Shizuoka, SHIZUOKA	30	34.5	0.036 ± 0.017	0.017 ± 0.014
Nagoya, AICHI	31	34.4	0.059 ± 0.018	0.019 ± 0.017
Ootsu, SHIGA	30	46.2	0.021 ± 0.0088	0.047 ± 0.018
Tsu, MIE	30	31.0	0.0019 ± 0.0076	0.037 ± 0.015
Kyoto, KYOTO	29	33.5	0.020 ± 0.0091	0.037 ± 0.017
Kobe, HYOUGO	30	16.5	0.0000 ± 0.0088	0.007 ± 0.011
Nara, NARA	30	47.3	0.038 ± 0.018	0.057 ± 0.022
Wakayama, WAKAYAMA	29	42.0	0.013 ± 0.0087	0.002 ± 0.011
Tottori, TOTTORI	30	103.9	0.016 ± 0.0096	0.030 ± 0.018
Matsue, SHIMANE	30	82.2	0.025 ± 0.0091	0.045 ± 0.014
Hiroshima, HIROSHIMA	30	35.4	0.032 ± 0.025	0.013 ± 0.019
Ishii-machi, TOKUSHIMA	30	19.5	0.010 ± 0.0079	0.029 ± 0.017
Takamatsu, KAGAWA	30	27.0	0.019 ± 0.0086	0.039 ± 0.014
Matsuyama, EHIME	30	42.0	0.016 ± 0.0079	0.006 ± 0.017
Dazaifu, FUKUOKA	30	43.2	0.021 ± 0.0090	0.012 ± 0.011

Location	Duration (days)	Precipitation (mm)	^{90}Sr (MBq/km²)	^{137}Cs (MBq/km²)
Saga, SAGA	30	40.2	0.0087 ± 0.0064	0.037 ± 0.016
Nagasaki, NAGASAKI	30	36.0	0.022 ± 0.012	0.022 ± 0.018
Uto, KUMAMOTO	30	35.7	0.017 ± 0.0087	0.014 ± 0.010
Ooita, OOITA	30	46.0	0.0067 ± 0.0078	0.013 ± 0.012
Miyazaki, MIYAZAKI	30	36.0	0.027 ± 0.0084	0.071 ± 0.019
Yonagusuku-mura, Okinawa	30	69.0	0.013 ± 0.0085	0.020 ± 0.014
March, 1996				
Sapporo, HOKKAIDOU	32	40.0	0.010 ± 0.0074	0.000 ± 0.011
Aomori, AOMORI	32	75.0	0.023 ± 0.013	0.022 ± 0.015
Morioka, IWATE	32	102.1	0.029 ± 0.0089	0.042 ± 0.015
Onagawa-machi, MIYAGI	32	150.0	0.030 ± 0.015	0.031 ± 0.017
Yamagata, YAMAGATA	32	101.0	0.033 ± 0.0099	0.065 ± 0.018
Ookuma-machi, FUKUSHIMA	32	98.0	0.023 ± 0.017	0.090 ± 0.022
Mito, IBARAKI	32	91.0	0.000 ± 0.012	0.023 ± 0.018
Maebashi, GUNMA	32	44.0	0.020 ± 0.013	0.088 ± 0.022
Urawa, SAITAMA	32	61.5	0.009 ± 0.010	0.048 ± 0.011
Ichihara, CHIBA	32	84.1	0.015 ± 0.0069	0.012 ± 0.012
Shinjuku, TOKYO	32	104.6	0.032 ± 0.0099	0.019 ± 0.017
Yokohama, KANAGAWA	30	115.1	0.009 ± 0.014	0.057 ± 0.015
Kosugi-machi, TOYAMA	32	113.1	0.044 ± 0.015	0.062 ± 0.020
Fukui, FUKUI	32	183.0	0.035 ± 0.036	0.000 ± 0.078
Koufu, YAMANASHI	32	108.5	0.024 ± 0.0085	0.014 ± 0.016
Gifu, GIFU	32	250.5	0.037 ± 0.018	0.023 ± 0.017
Shizuoka, SHIZUOKA	32	342.0	0.005 ± 0.011	0.033 ± 0.018
Nagoya, AICHI	32	211.4	0.028 ± 0.013	0.088 ± 0.021
Ootsu, SHIGA	32	149.6	0.012 ± 0.0089	0.049 ± 0.020
Tsu, MIE	32	155.5	0.025 ± 0.0086	0.10 ± 0.022

Location	Duration (days)	Precipitation (mm)	^{90}Sr (MBq/km²)	^{137}Cs (MBq/km²)
Kyoto, KYOTO	34	211.5	0.0092 ± 0.0086	0.034 ± 0.018
Kobe, HYOUGO	30	82.8	0.024 ± 0.0082	0.018 ± 0.017
Nara, NARA	32	143.8	0.031 ± 0.015	0.063 ± 0.022
Wakayama, WAKAYAMA	31	141.5	0.046 ± 0.030	0.029 ± 0.024
Tottori, TOTTORI	32	120.1	0.072 ± 0.012	0.066 ± 0.019
Matsue, SHIMANE	32	149.7	0.026 ± 0.010	0.081 ± 0.016
Hiroshima, HIROSHIMA	32	178.0	0.034 ± 0.017	0.066 ± 0.025
Ishii-machi, TOKUSHIMA	29	46.0	0.014 ± 0.0078	0.020 ± 0.016
Takamatsu, KAGAWA	32	34.0	0.017 ± 0.0086	0.000 ± 0.012
Matsuyama, EHIME	32	89.0	0.020 ± 0.0080	0.028 ± 0.017
Dazaifu, FUKUOKA	32	151.1	0.016 ± 0.0078	0.000 ± 0.016
Saga, SAGA	32	166.2	0.024 ± 0.0075	0.059 ± 0.019
Nagasaki, NAGASAKI	32	110.0	0.018 ± 0.0091	0.049 ± 0.018
Uto, KUMAMOTO	32	152.1	0.022 ± 0.014	0.051 ± 0.018
Ooita, OOITA	31	120.4	0.025 ± 0.013	0.062 ± 0.020
Miyazaki, MIYAZAKI	32	176.4	0.030 ± 0.011	0.058 ± 0.021
Yonagusuku-mura, Okinawa	34	206.0	0.0026 ± 0.0077	0.029 ± 0.020

6. Results

(1)-2 Strontuim-90 and Cesium-137 in Rain and Dry Fallout (for WHO program) (from Oct. 1995 to Mar. 1996)

-continued from No. 114 of this publication-

Table (1)-2 : Strontium-90 and Cesium-137 in Rain and Dry Fallout

Location	Duration (days)	Precipitation (mm)	^{90}Sr (MBq/km^2)	^{137}Cs (MBq/km^2)
October, 1995				
Akita, AKITA	30	193.1	0.019 ± 0.0080	0.013 ± 0.013
Chiba, CHIBA	34	88.1	0.014 ± 0.0069	0.0072 ± 0.0090
Niigata, NIIGATA	31	86.3	0.015 ± 0.0075	0.003 ± 0.010
Kanazawa, ISHIKAWA	34	97.0	0.031 ± 0.0084	0.018 ± 0.013
Nagano, NAGANO	31	23.0	0.015 ± 0.0082	0.008 ± 0.010
Osaka, OSAKA	30	42.6	0.023 ± 0.0088	0.013 ± 0.019
Okayama, OKAYAMA	31	45.1	0.0000 ± 0.0070	0.000 ± 0.014
Yamaguchi, YAMAGUCHI	31	47.0	0.024 ± 0.0085	0.009 ± 0.012
Kochi, KOCHI	31	22.9	0.075 ± 0.012	0.000 ± 0.015
Kagoshima, KAGOSHIMA	33	93.5	0.009 ± 0.014	0.013 ± 0.018
November, 1995				
Akita, AKITA	31	247.7	0.044 ± 0.011	0.009 ± 0.013
Chiba, CHIBA	31	52.7	0.028 ± 0.0084	0.0036 ± 0.0093
Niigata, NIIGATA	31	200.7	0.023 ± 0.0072	0.020 ± 0.017
Kanazawa, ISHIKAWA	28	388.5	0.017 ± 0.0071	0.030 ± 0.015
Nagano, NAGANO	31	41.8	0.024 ± 0.0077	0.015 ± 0.013
Osaka, OSAKA	32	55.7	0.021 ± 0.012	0.005 ± 0.018
Okayama, OKAYAMA	31	44.1	0.0057 ± 0.0079	0.004 ± 0.014
Yamaguchi, YAMAGUCHI	31	48.0	0.011 ± 0.0073	0.012 ± 0.012
Kochi, KOCHI	31	44.3	0.055 ± 0.010	0.037 ± 0.019
Kagoshima, KAGOSHIMA	29	59.5	0.071 ± 0.018	0.031 ± 0.017
December, 1995				
Akita, AKITA	36	153.4	0.016 ± 0.0096	0.022 ± 0.012
Chiba, CHIBA	27	0.4	0.013 ± 0.0083	0.022 ± 0.014
Niigata, NIIGATA	35	258.9	0.0071 ± 0.0063	0.050 ± 0.022
Kanazawa, ISHIKAWA	31	284.5	0.013 ± 0.012	0.046 ± 0.018

Location	Duration (days)	Precipitation (mm)	^{90}Sr (MBq/km²)	^{137}Cs (MBq/km²)
Nagano, NAGANO	36	28.1	0.012 ± 0.0079	0.037 ± 0.013
Osaka, OSAKA	36	4.1	0.021 ± 0.0088	0.000 ± 0.013
Okayama, OKAYAMA	36	1.4	0.0000 ± 0.0080	0.011 ± 0.017
Yamaguchi, YAMAGUCHI	35	34.5	0.019 ± 0.0078	0.015 ± 0.011
Kochi, KOCHI	35	1.0	0.057 ± 0.011	0.019 ± 0.013
Kagoshima, KAGOSHIMA	31	3.5	0.045 ± 0.016	0.000 ± 0.011
January, 1996				
Akita, AKITA	32	96.7	0.037 ± 0.011	0.015 ± 0.013
Chiba, CHIBA	37	24.8	0.025 ± 0.0084	0.061 ± 0.016
Niigata, NIIGATA	29	168.1	0.0000 ± 0.0056	0.035 ± 0.020
Kanazawa, ISHIKAWA	36	191.0	0.056 ± 0.016	0.066 ± 0.020
Nagano, NAGANO	28	38.2	0.000 ± 0.011	0.027 ± 0.012
Osaka, OSAKA	28	37.2	0.0091 ± 0.0078	0.004 ± 0.012
Okayama, OKAYAMA	28	35.6	0.0000 ± 0.0067	0.0000 ± 0.0098
Yamaguchi, YAMAGUCHI	29	37.5	0.000 ± 0.011	0.021 ± 0.012
Kochi, KOCHI	29	58.1	0.076 ± 0.011	0.065 ± 0.017
Kagoshima, KAGOSHIMA	36	69.0	0.069 ± 0.011	0.039 ± 0.021
Febraly, 1996				
Akita, AKITA	26	92.2	0.000 ± 0.010	0.015 ± 0.012
Chiba, CHIBA	30	54.3	0.027 ± 0.0082	0.066 ± 0.017
Niigata, NIIGATA	30	92.9	0.0037 ± 0.0058	0.063 ± 0.019
Kanazawa, ISHIKAWA	30	81.0	0.002 ± 0.012	0.019 ± 0.018
Nagano, NAGANO	30	39.1	0.000 ± 0.016	0.012 ± 0.010
Osaka, OSAKA	30	68.1	0.017 ± 0.014	0.034 ± 0.014
Okayama, OKAYAMA	30	34.0	0.018 ± 0.0083	0.031 ± 0.015
Yamaguchi, YAMAGUCHI	30	62.5	0.026 ± 0.013	0.000 ± 0.015
Kochi, KOCHI	30	64.1	0.075 ± 0.018	0.000 ± 0.011

Location	Duration (days)	Precipitation (mm)	^{90}Sr (MBq/km²)	^{137}Cs (MBq/km²)
Kagoshima, KAGOSHIMA	29	24.5	0.035 ± 0.0083	0.054 ± 0.022
March, 1996				
Akita, AKITA	32	165.9	0.010 ± 0.0072	0.049 ± 0.019
Chiba, CHIBA	31	74.2	0.031 ± 0.0086	0.028 ± 0.015
Niigata, NIIGATA	32	121.9	0.0098 ± 0.0084	0.083 ± 0.021
Kanazawa, ISHIKAWA	34	101.0	0.021 ± 0.012	0.055 ± 0.019
Nagano, NAGANO	33	86.5	0.0011 ± 0.0047	0.023 ± 0.015
Osaka, OSAKA	32	107.5	0.019 ± 0.0095	0.000 ± 0.011
Okayama, OKAYAMA	32	63.5	0.0000 ± 0.0078	0.006 ± 0.016
Yamaguchi, YAMAGUCHI	32	222.5	0.0069 ± 0.0075	0.039 ± 0.017
Kochi, KOCHI	32	228.3	0.052 ± 0.0098	0.061 ± 0.020
kagoshima, KAGOSHIMA	33	135.0	0.029 ± 0.0075	0.063 ± 0.024

(2) Strontium-90 and Cesium-137 in Airborne Dust
(from Oct. 1995 to Mar. 1996)

-continued from No. 114 of this publication-

Table (2) :Strontium-90 and Cesium-137 in Airborne Dust

Location	Sampling period	Absorption volume (m^2)	^{90}Sr (mBq/m^3)	^{137}Cs (mBq/m^3)
October~December, 1995				
Morioka, IWATE	10~12	10,063.0	0.00013 ± 0.00038	0.00053 ± 0.00054
Akita, AKITA	10~12	10,800.0	0.00047 ± 0.00035	0.00030 ± 0.00049
Yamagata, YAMAGATA	10~12	12,960.0	0.00000 ± 0.00023	0.00009 ± 0.00039
Ookuma-machi, FUKUSHIMA	10~12	9,397.0	0.00019 ± 0.00034	0.0011 ± 0.00059
Mito, IBARAKI	10~12	8,711.7	0.00041 ± 0.00034	0.00000 ± 0.00044
Utsunomiya, TOCHIGI	10~12	12,993.0	0.00031 ± 0.00051	0.00000 ± 0.00045
Maebashi, GUNMA	10~12	12,828.0	0.0001 ± 0.00027	0.00049 ± 0.00047
Ichihara, CHIBA	10~12	12,960.0	0.00009 ± 0.00028	0.00027 ± 0.00027
Yokohama, KANAGAWA	10~12	10,629.0	0.00000 ± 0.00049	0.00039 ± 0.00053
Niigata, NIIGATA	10~12	9,799.0	0.00078 ± 0.00034	0.00029 ± 0.00062
Kosugi-machi, TOYAMA	10~12	18,435.0	0.00006 ± 0.00019	0.00021 ± 0.00031
Fukui, FUKUI	10~12	13,101.2	0.00000 ± 0.00023	0.0011 ± 0.00038
Koufu, YAMANASHI	10~12	11,539.0	0.00060 ± 0.00029	0.00030 ± 0.00031
Nagano, NAGANO	10~12	11,719.0	0.00022 ± 0.00027	0.00000 ± 0.00034
Gifu, GIFU	10~12	10,856.0	0.00000 ± 0.00028	0.00000 ± 0.00044
Hamaoka-machi, SHIZUOKA	10~12	10,576.0	0.00059 ± 0.00036	0.0055 ± 0.00084
Nagoya, AICHI	10~12	10,874.0	0.00000 ± 0.00054	0.00092 ± 0.00058
Ootsu, SHIGA	10~12	11,682.0	0.00011 ± 0.00027	0.00000 ± 0.00040
Tsu, MIE	10~12	14,206.0	0.00029 ± 0.00023	0.00000 ± 0.00024
Kyoto, KYOTO	10~12	10,320.0	0.00000 ± 0.00052	0.00008 ± 0.00035
Osaka, OSAKA	10~12	15,514.0	0.00031 ± 0.00024	0.00000 ± 0.00034
Kobe, HYOUGO	10~12	10,349.0	0.00036 ± 0.00036	0.00097 ± 0.00057
Nara, NARA	10~12	10,756.2	0.00031 ± 0.00036	0.00000 ± 0.00049
Wakayama, WAKAYAMA	10~12	10,368.0	0.00030 ± 0.00031	0.00000 ± 0.00033

Location	Sampling period	Absorption volume (m^2)	^{90}Sr (mBq/m^3)	^{137}Cs (mBq/m^3)
Tottori, TOTTORI	10～12	13,937.0	0.00068 ± 0.00025	0.00000 ± 0.00021
Okayama, OKAYAMA	10～12	12,470.0	0.00043 ± 0.00028	0.00000 ± 0.00027
Hiroshima, HIROSHIMA	10～12	9,813.0	0.00007 ± 0.00034	0.00028 ± 0.00063
Yamaguchi, YAMAGUCHI	10～12	18,897.0	0.00000 ± 0.00015	0.00034 ± 0.00021
Tokushima, TOKUSHIMA	10～12	10,080.0	0.00000 ± 0.00032	0.0014 ± 0.00063
Takamatsu, KAGAWA	10～12	14,667.2	0.00014 ± 0.00020	0.00023 ± 0.00030
Saga, SAGA	10～12	9,954.9	0.00034 ± 0.00035	0.00000 ± 0.00053
Nagasaki, NAGASAKI	10～12	10,368.0	0.00027 ± 0.00034	0.00086 ± 0.00054
Uto, KUMAMOTO	10～12	10,978.0	0.00000 ± 0.00027	0.00000 ± 0.00054
Ooita, OOITA	10～12	10,377.0	0.00000 ± 0.00026	0.00000 ± 0.00034
Miyazaki, MIYAZAKI	10～12	12,867.0	0.00068 ± 0.00032	0.00038 ± 0.00042
January～March, 1996				
Morioka, IWATE	1～ 3	10,373.0	0.00018 ± 0.00031	0.00000 ± 0.00046
Akita, AKITA	1～ 3	10,800.0	0.00062 ± 0.00034	0.00080 ± 0.00054
Yamagata, YAMAGATA	1～ 3	12,960.0	0.00038 ± 0.00040	0.00000 ± 0.00024
Ookuma-machi, FUKUSHIMA	1～ 3	11,045.4	0.00083 ± 0.00046	0.00000 ± 0.00044
Mito, IBARAKI	1～ 3	8,276.3	0.00058 ± 0.00042	0.00000 ± 0.00068
Utsunomiya, TOCHIGI	1～ 2	8,620.0	0.00030 ± 0.00036	0.00070 ± 0.00052
Maebashi, GUNMA	1～ 3	13,036.0	0.00023 ± 0.00027	0.00054 ± 0.00043
Ichihara, CHIBA	1～ 3	12,960.0	0.00000 ± 0.00026	0.00018 ± 0.00028
Yokohama, KANAGAWA	1～ 3	10,607.0	0.00012 ± 0.00033	0.00000 ± 0.00048
Niigata, NIIGATA	1～ 3	10,775.0	0.00050 ± 0.00050	0.00089 ± 0.00059
Kosugi-machi, TOYAMA	1～ 3	18,283.0	0.00038 ± 0.00023	0.00000 ± 0.00031
Fukui, FUKUI	1～ 3	13,255.7	0.00009 ± 0.00025	0.00047 ± 0.00029
Koufu, YAMANASHI	1～ 3	11,734.0	0.00025 ± 0.00028	0.00000 ± 0.00048

Location	Sampling period	Absorption volume (m^3)	^{90}Sr (mBq/m^3)		^{137}Cs (mBq/m^3)	
Nagano, NAGANO	1～ 3	12,585.0	0.00047	± 0.00031	0.00000	± 0.00045
Gifu, GIFU	1～ 3	11,547.0	0.00057	± 0.00035	0.00000	± 0.00047
Hamaoka-machi, SHIZUOKA	1～ 3	10,468.0	0.0010	± 0.00040	0.00062	± 0.00058
Nagoya, AICHI	1～ 3	10,985.0	0.0011	± 0.00039	0.00000	± 0.00054
Ootsu, SHIGA	1～ 3	11,484.0	0.00073	± 0.00031	0.00000	± 0.00048
Tsu, MIE	1～ 3	14,081.0	0.00043	± 0.00026	0.00006	± 0.00037
Kyoto, KYOTO	1～ 3	10,388.0	0.00058	± 0.00036	0.00004	± 0.00034
Osaka, OSAKA	1～ 3	16,740.0	0.00063	± 0.00023	0.00037	± 0.00023
Kobe, HYOUGO	1～ 3	10,324.0	0.00013	± 0.00030	0.0012	± 0.00054
Nara, NARA	1～ 3	10,998.6	0.0012	± 0.00037	0.0013	± 0.00053
Wakayama, WAKAYAMA	1～ 3	10,368.0	0.00005	± 0.00033	0.00034	± 0.00034
Tottori, TOTTORI	1～ 3	14,028.0	0.00018	± 0.00025	0.00020	± 0.00045
Okayama, OKAYAMA	1～ 3	12,419.0	0.00066	± 0.00032	0.00000	± 0.00046
Hiroshima, HIROSHIMA	1～ 3	9,604.0	0.00068	± 0.00032	0.00000	± 0.00055
Yamaguchi, YAMAGUCHI	1～ 3	18,761.0	0.00021	± 0.00019	0.00009	± 0.00028
Tokushima, TOKUSHIMA	1～ 3	10,080.0	0.00043	± 0.00028	0.00032	± 0.00053
Takamatsu, KAGAWA	1～ 3	15,041.1	0.00006	± 0.00023	0.00027	± 0.00037
Saga, SAGA	1～ 3	9,724.0	0.00044	± 0.00038	0.00020	± 0.00036
Nagasaki, NAGASAKI	1～ 3	10,368.0	0.00090	± 0.00050	0.00024	± 0.00051
Uto, KUMAMOTO	1～ 3	12,271.0	0.00025	± 0.00036	0.00088	± 0.00045
Ooita, OOITA	1～ 3	10,397.0	0.00063	± 0.00035	0.00060	± 0.00057
Miyazaki, MIYAZAKI	1～ 3	13,110.0	0.00042	± 0.00029	0.00035	± 0.00028

(3) Strontium-90 and cesium-137 in Service Water
(from Oct. 1995 to Mar. 1996)

-continued from No, 114 of this publication-

Table (3) :Strontium-90 and cesium-137 in Service Water

Location	pH	^{90}Sr (mBq/ ℓ)		^{137}Cs (mBq/ ℓ)	
(Source Water)					
December, 1995					
Urawa, SAITAMA	7.8	0.19	± 0.059	0.000	± 0.077
Kisarazu, CHIBA	7.4	1.4	± 0.14	0.000	± 0.047
Katsushika, TOKYO	7.3	1.2	± 0.17	0.21	± 0.10
Tsukui-machi, KANAGAWA	7.3	0.57	± 0.067	0.000	± 0.083
Inuyama, AICHI	6.9	2.3	± 0.12	0.56	± 0.11
Moriguchi, OSAKA	7.2	2.9	± 0.14	0.000	± 0.081
Fukuoka, FUKUOKA	7.2	2.3	± 0.12	0.078	± 0.062
January, 1996					
Sapporo, HOKKAIDOU	7.0	1.5	± 0.10	0.000	± 0.057
Kyoto, KYOTO	8.05	2.6	± 0.14	0.21	± 0.071
March, 1996					
Nagano, NAGANO	7.71	1.3	± 0.24	0.090	± 0.092
(Tap Water)					
October, 1995					
Sendai, MIYAGI	—	2.0	± 0.25	0.043	± 0.066
November, 1995					
Fukushima, FUKUSHIMA	7.17	1.9	± 0.10	0.000	± 0.057
Nagano, NAGANO	7.60	0.64	± 0.066	0.15	± 0.091
December, 1995					
Wakkanai, HOKKAIDOU	6.7	1.3	± 0.14	0.075	± 0.060
Aomori, AOMORI	7.58	0.96	± 0.074	0.34	± 0.095
Morioka, IWATE	7.2	1.1	± 0.11	0.012	± 0.083
Akita, AKITA	6.05	2.9	± 0.21	0.12	± 0.094
Yamagata, YAMAGATA	7.0	2.1	± 0.11	0.14	± 0.060

Location	pH	^{90}Sr (mBq/ ℓ)		^{137}Cs (mBq/ ℓ)	
Mito, IBARAKI	7.9	1.2	± 0.09	0.006	± 0.052
Utsunomiya, TOCHIGI	7.50	0.43	± 0.063	0.023	± 0.085
Maebashi, GUNMA	7.2	1.5	± 0.14	0.011	± 0.076
Urawa, SAITAMA	7.0	1.2	± 0.09	0.000	± 0.067
Ichihara, CHIBA	7.1	1.9	± 0.18	0.084	± 0.059
Katsushika, TOKYO	7.1	1.1	± 0.17	0.09	± 0.10
Yokohama, KANAGAWA	7.2	0.59	± 0.070	0.000	± 0.087
Niigata, NIIGATA	6.66	3.2	± 0.14	0.000	± 0.075
Kosugi-machi, TOYAMA	6.9	1.4	± 0.10	0.18	± 0.087
Kanazawa, ISHIKAWA	6.91	2.6	± 0.12	0.000	± 0.096
Fukui, FUKUI	6.35	0.75	± 0.11	0.000	± 0.049
Koufu, YAMANASHI	7.2	1.1	± 0.15	0.040	± 0.055
Gifu, GIFU	7.02	1.0	± 0.09	0.000	± 0.070
Shizuoka, SHIZUOKA	7.5	0.84	± 0.13	0.000	± 0.078
Nagoya, AICHI	6.8	2.2	± 0.15	0.31	± 0.098
Ootsu, SHIGA	6.9	2.9	± 0.27	0.023	± 0.052
Tsu, MIE	7.0	2.1	± 0.11	0.000	± 0.077
Osaka, OSAKA	7.2	2.9	± 0.14	0.18	± 0.091
Kobe, HYOUGO	7.31	1.4	± 0.10	0.052	± 0.070
Nara, NARA	7.4	2.8	± 0.14	0.000	± 0.048
Tottori, TOTTORI	7.3	2.4	± 0.19	0.000	± 0.050
Matsue, SHIMANE	—	3.5	± 0.23	0.000	± 0.052
Okayama, OKAYAMA	7.05	2.4	± 0.12	0.019	± 0.083
Hiroshima, HIROSHIMA	6.80	1.0	± 0.15	0.040	± 0.058
Takamatsu, KAGAWA	7.15	2.7	± 0.25	0.000	± 0.049
Matsuyama, EHIME	7.7	1.4	± 0.10	0.10	± 0.060

Location	pH	^{90}Sr (mBq/ ℓ)		^{137}Cs (mBq/ ℓ)	
Kochi, KOCHI	7.7	1.9	± 0.12	0.044	± 0.092
Fukuoka, FUKUOKA	6.8	2.6	± 0.13	0.000	± 0.057
Saga, SAGA	7.33	1.3	± 0.10	0.11	± 0.077
Nagasaki, NAGASAKI	6.73	1.4	± 0.11	0.040	± 0.061
Uto, KUMAMOTO	7.44	0.000	± 0.048	0.006	± 0.080
Ooita, OOITA	7.48	0.70	± 0.12	0.12	± 0.073
Miyazaki, MIYAZAKI	6.75	1.2	± 0.10	0.000	± 0.055
Kagoshima, KAGOSHIMA	8.1	0.42	± 0.069	0.17	± 0.086
January, 1996					
Kyoto, KYOTO	8.05	2.6	± 0.13	0.14	± 0.065
, 1996					
Naha, Okinawa	7.70	3.6	± 0.14	0.000	± 0.073

(4) Strontium-90 and cesium-137 in Freshwater
(from Oct. 1995 to Mar. 1996)

-continued from No. 114 of this publication-

Table (4) :Strontium-90 and cesium-137 in Freshwater

Location	pH	^{90}Sr (mBq/ ℓ)		^{137}Cs (mBq/ ℓ)	
(FreshWater)					
October, 1995					
Fukushima, FUKUSHIMA	7.89	0.18	± 0.059	0.000	± 0.056
Shobara, HIROSHIMA	7.12	1.9	± 0.15	0.000	± 0.089
November, 1995					
Niigata, NIIGATA	6.82	3.7	± 0.16	0.50	± 0.097
December, 1995					
Suwa, NAGANO	7.44	0.78	± 0.075	0.035	± 0.088
Uji, KYOTO	7.32	0.000	± 0.038	0.000	± 0.047

(5) Strontium-90 and Cesium-137 in Soil
(from Oct. 1995 to Mar. 1996)
-continued from No. 114 of this publication-

Table (5) Strontium-90 and Cesium-137 in Soil

Location	Sampling Depth (cm)	^{90}Sr (Bq/kg) (dried Soil)		^{90}Sr (MBq/km²)		^{137}Cs (Bq/kg) (dried Soil)		^{137}Cs (MBq/km²)	
October, 1995									
Iwadeyama-machi, MIYAGI	0～ 5	1.7	± 0.10	69	± 4.0	3.9	± 0.23	160	± 9
	5～20	1.0	± 0.08	170	± 13	0.99	± 0.13	170	± 23
Akita, AKITA	0～ 5	18	± 0.3	370	± 7	51	± 0.8	1100	± 20
	5～20	8.5	± 0.22	800	± 21	52	± 0.8	4900	± 80

(6) Strontium-90 and Cesium-137 in Sea Water
(from Oct. 1995 to Mar. 1996)
-continued from No. 114 of this publication-

Table (6) Strontium-90 and Cesium-137 in Sea Water

Location	Sample volume analyzed (ℓ)	Cl (ℓ)	^{90}Sr (mBq/ ℓ)	^{137}Cs (mBq/ ℓ)
October, 1995				
Katsuren-machi, Okinawa	40.0	18.87	1.9 ± 0.19	2.7 ± 0.35

(7) Strontium-90 and Cesium-137 in Sea Sediments
(from Oct. 1995 to Mar. 1996)
-continued from No. 114 of this publication-

Table (7) Strontium-90 and Cesium-137 in Sea Sediments

Location	Depth (m)	^{90}Sr (Bq/kg·dried Soil)	^{137}Cs (Bq/kg·dried Soil)
October, 1995			
Katsuren-machi, Okinawa	14.05	0.015 ± 0.036	0.40 ± 0.086

＊ ＊ Rain and Dry Fallout (for domestic program) ＊ ＊

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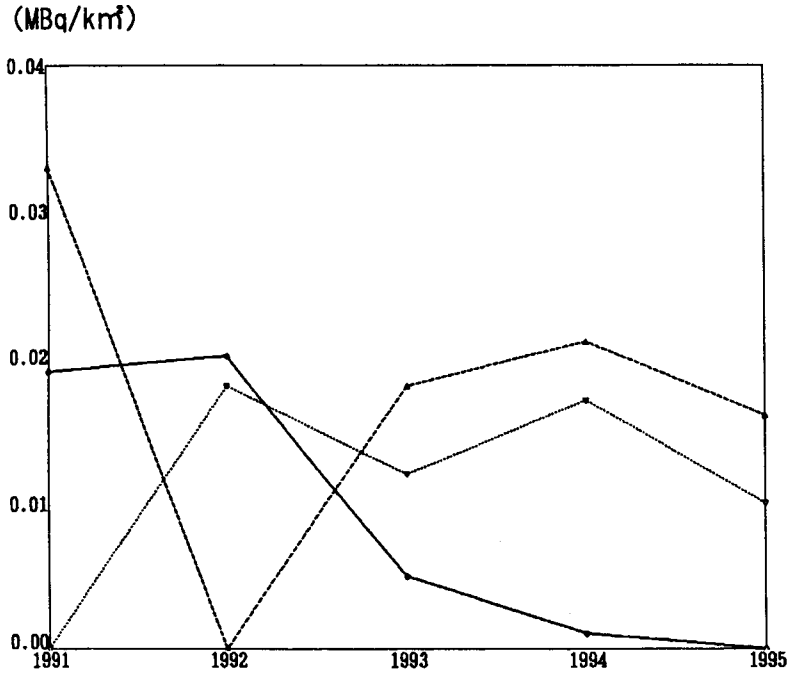

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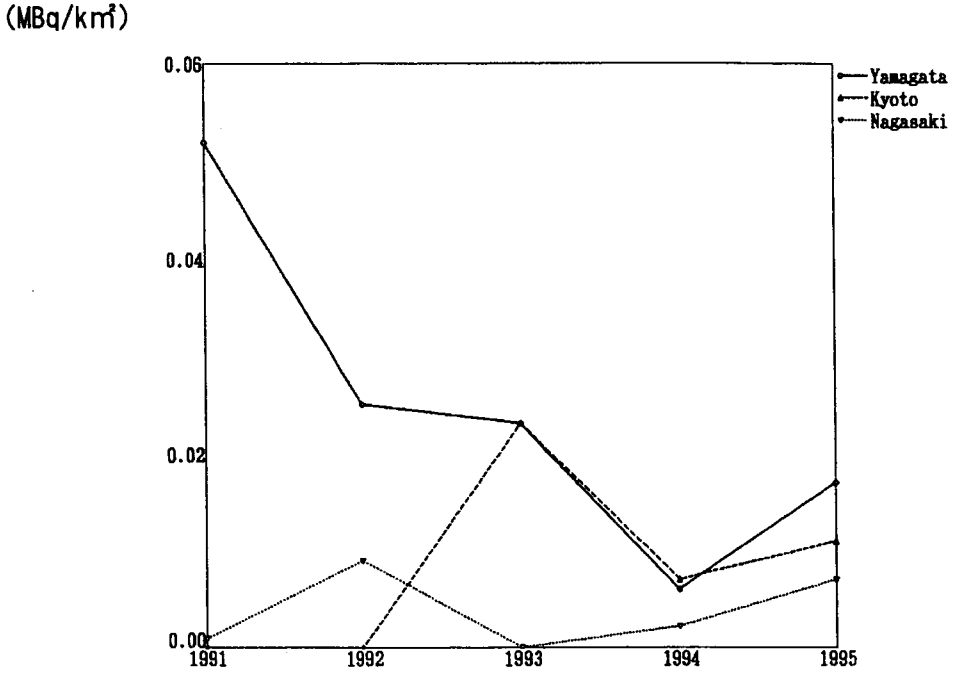

Fig. 1—1

＊＊ Rain and Dry Fallout (for WHO program) ＊＊

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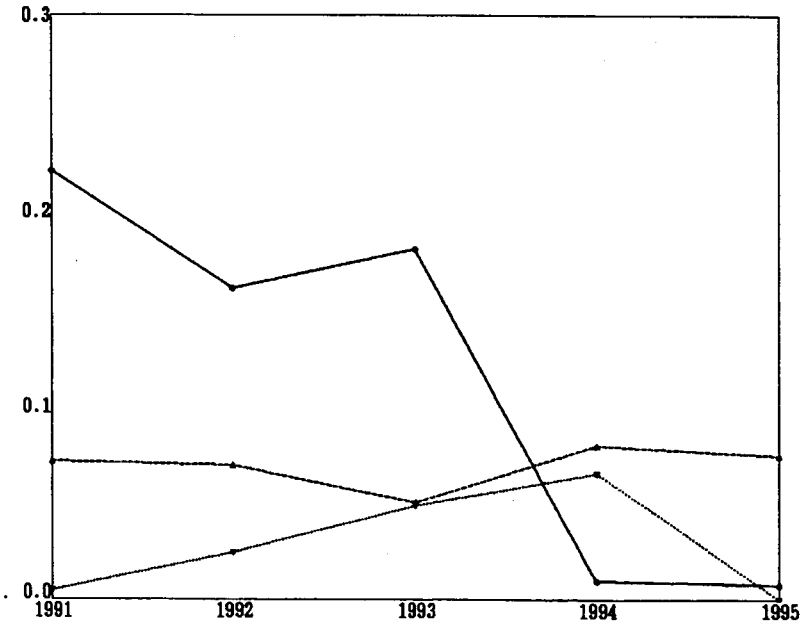

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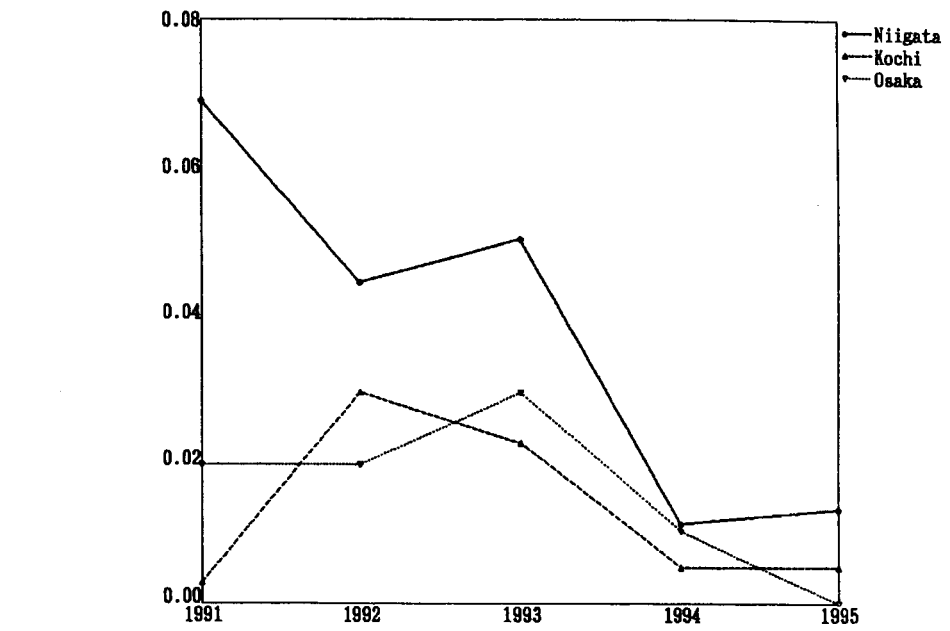

Fig.1—2

* * Airborne Dust * *

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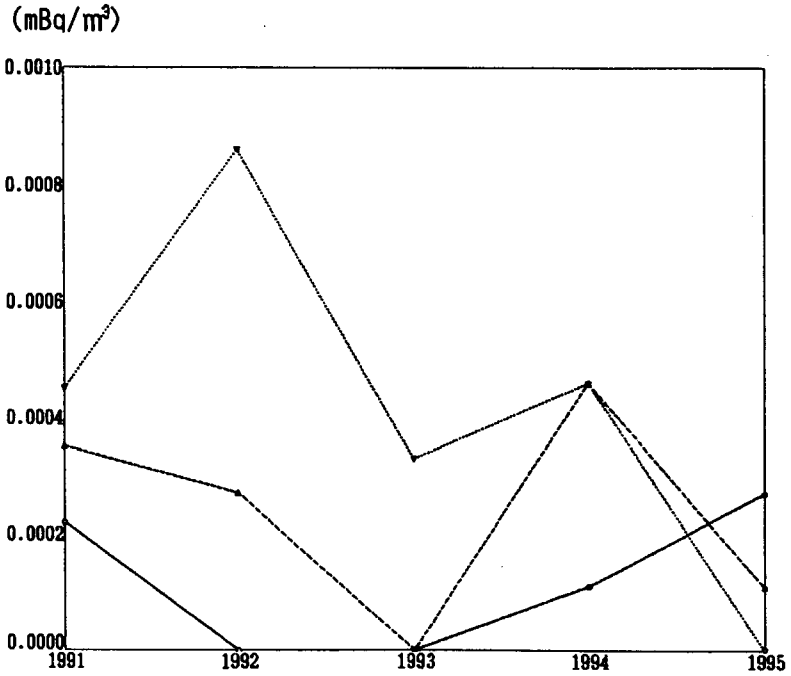

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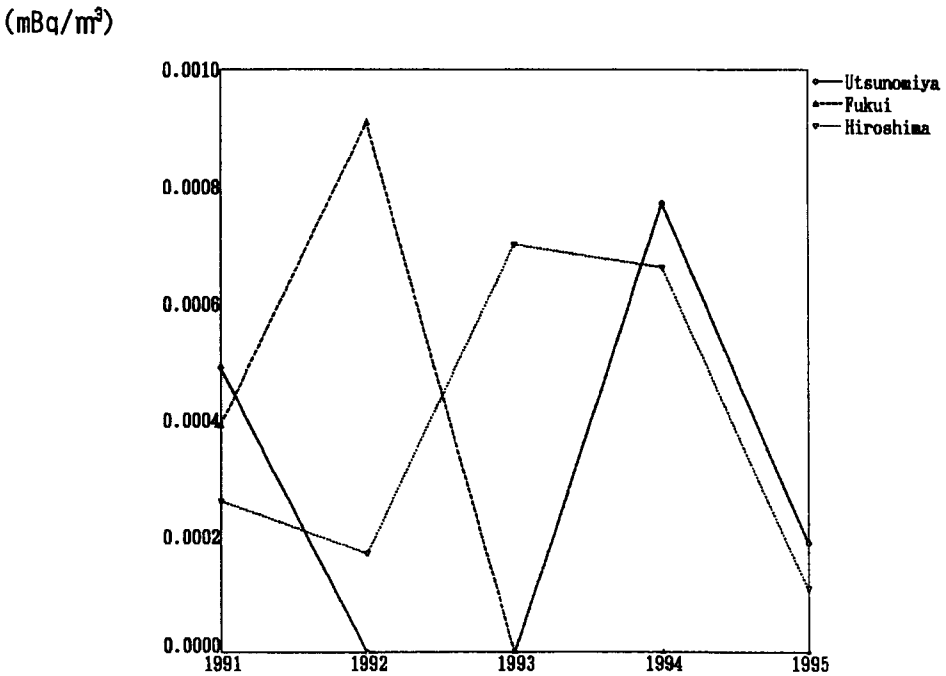

Fig. 2

* * Service Water (Source Water) * *

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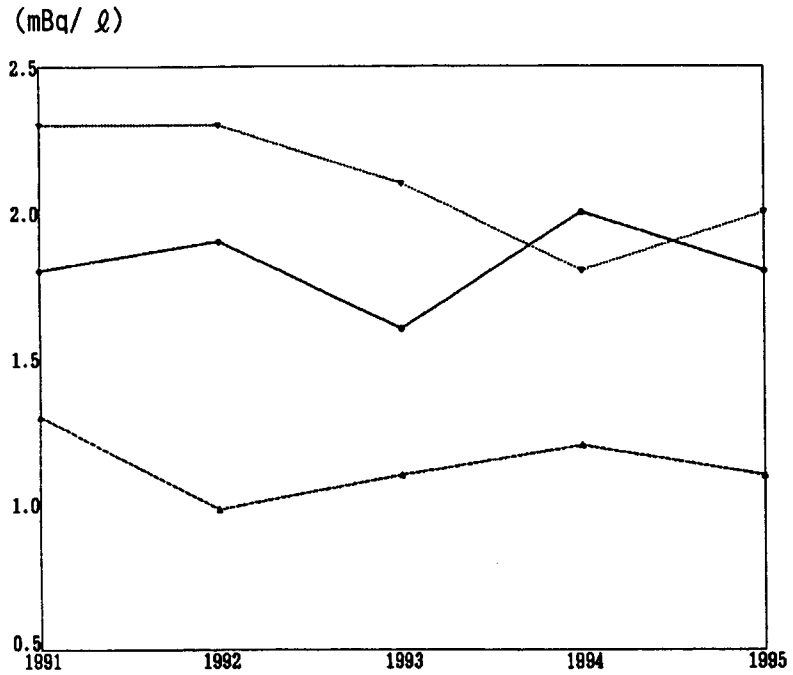

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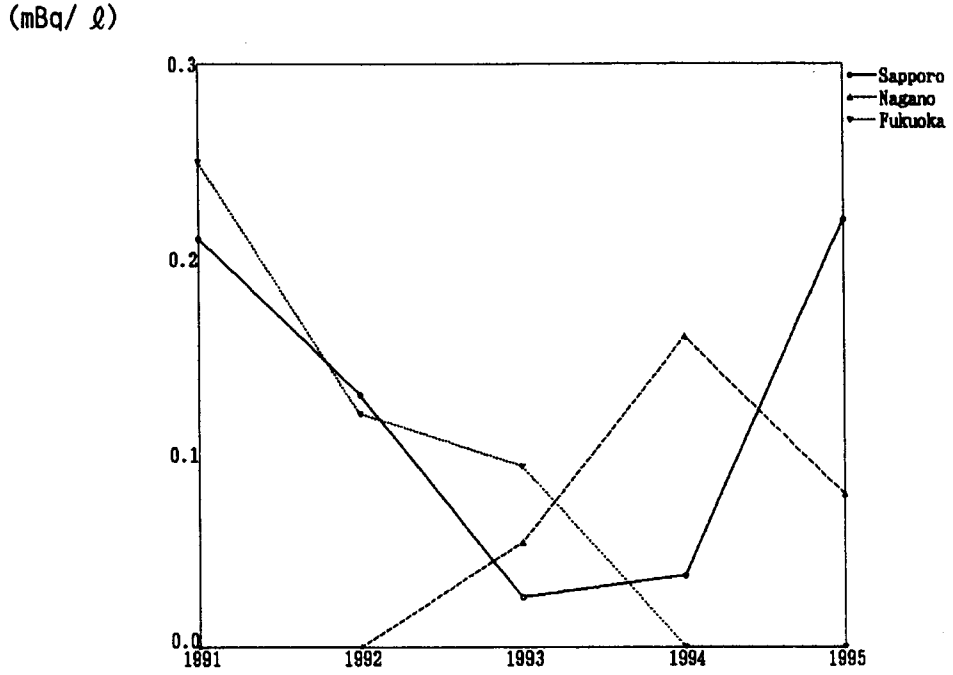

Fig. 3—1

* * Service Water (Tap Water) * *

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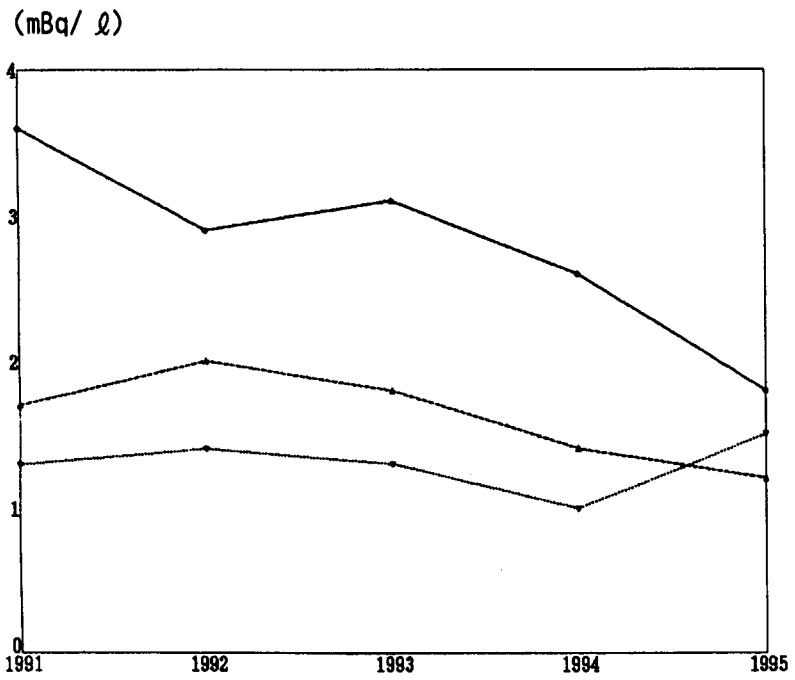

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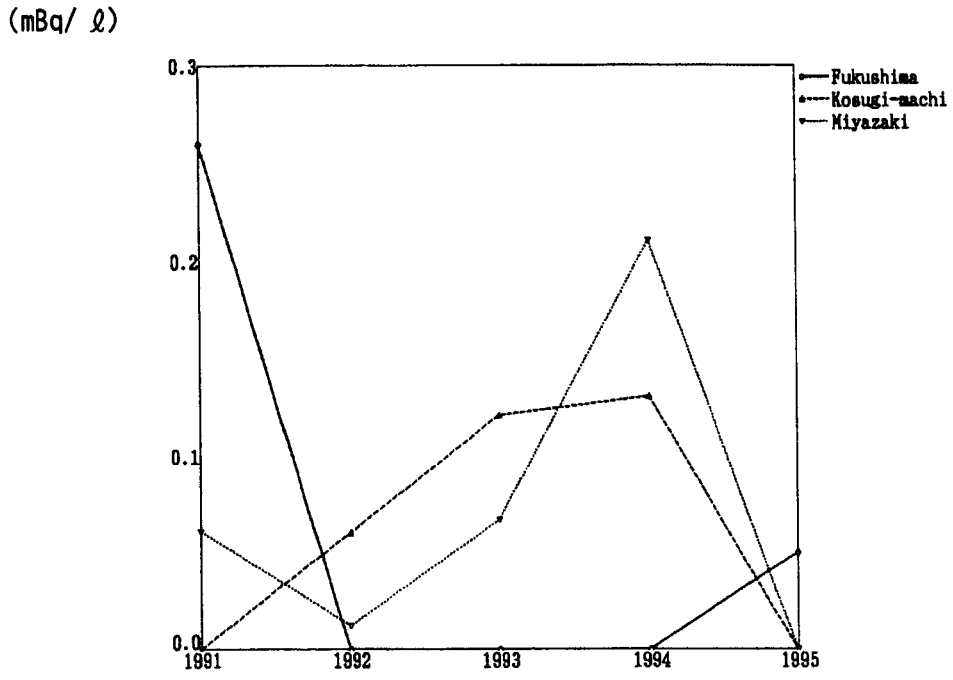
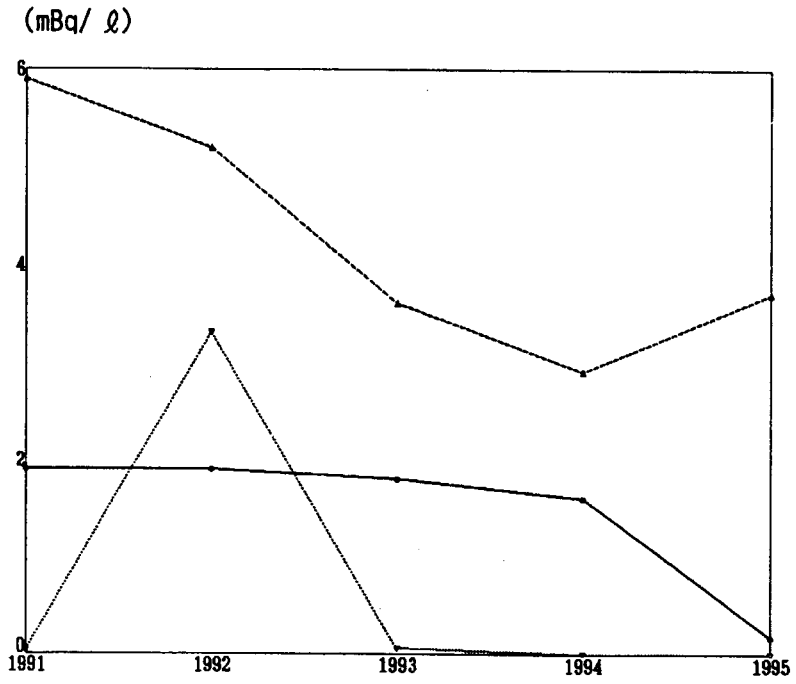


Fig. 3—2

* * Fresh Water * *

<Strontium-90>



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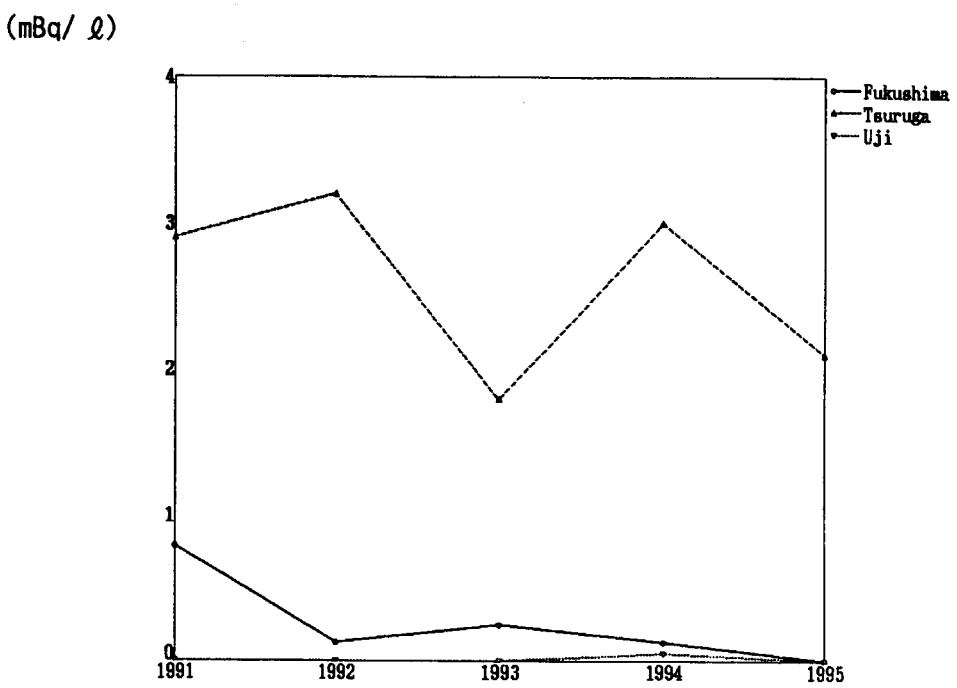
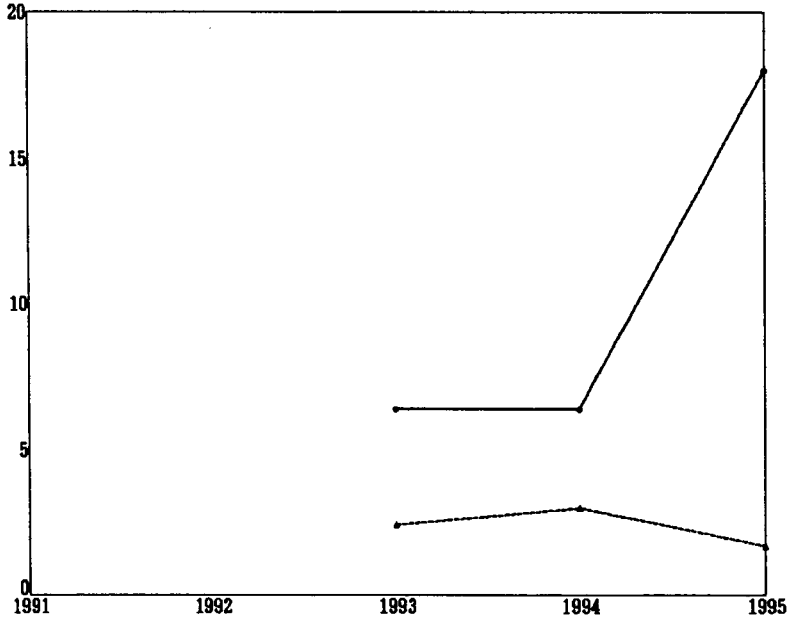


Fig. 4

＊ ＊ Soil ＊ ＊

<Strontium-90>

(Bq/kg)(dried So



<Cesium-137>

(Bq/kg)(dried So

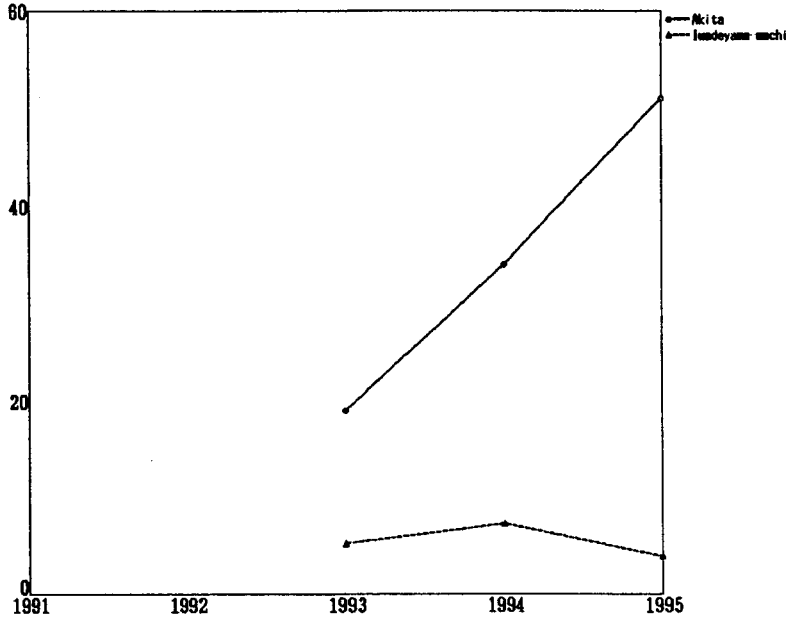
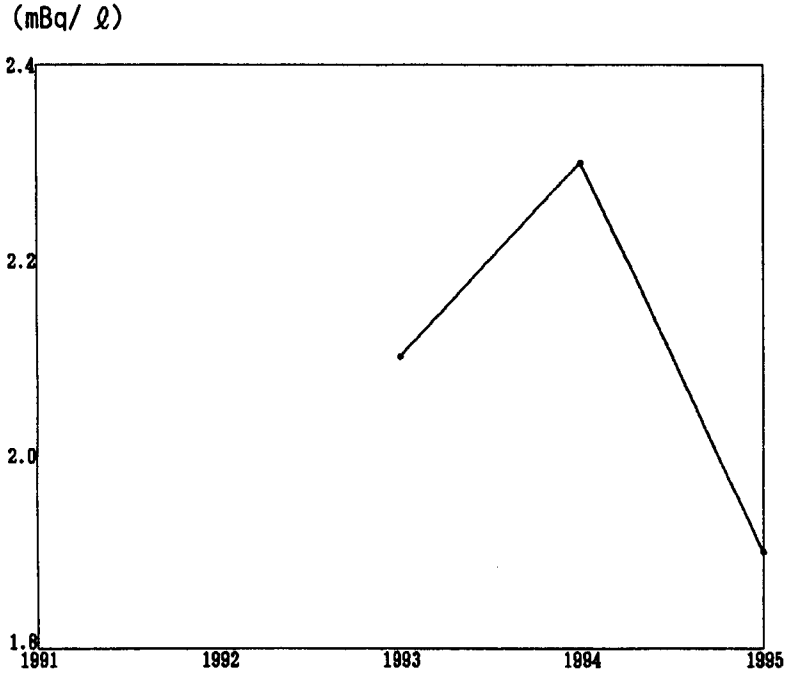


Fig. 5

* * Sea Water * *

<Strontium-90>



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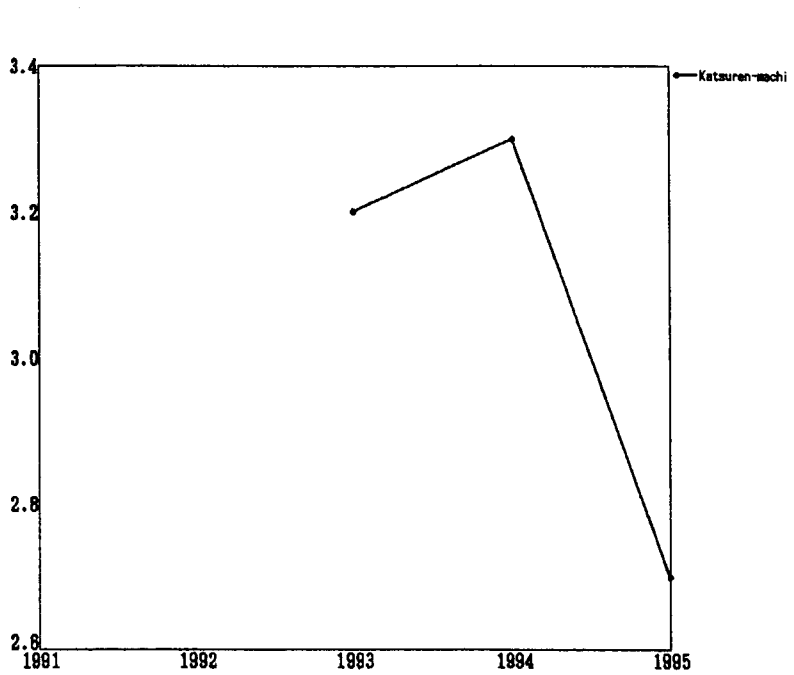
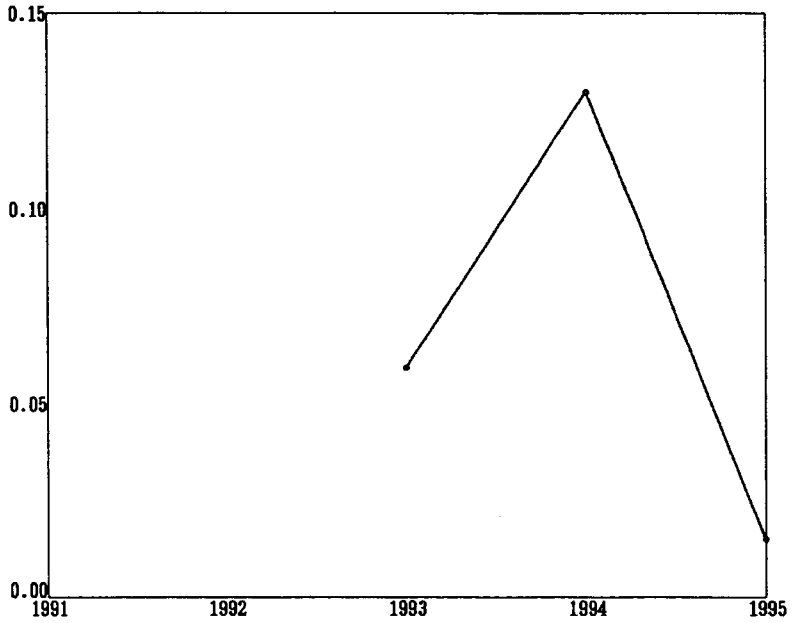


Fig. 6

* * Sea Sediments * *

<Strontium-90>

(Bq/kg･dried Soi



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(Bq/kg･dried Soi

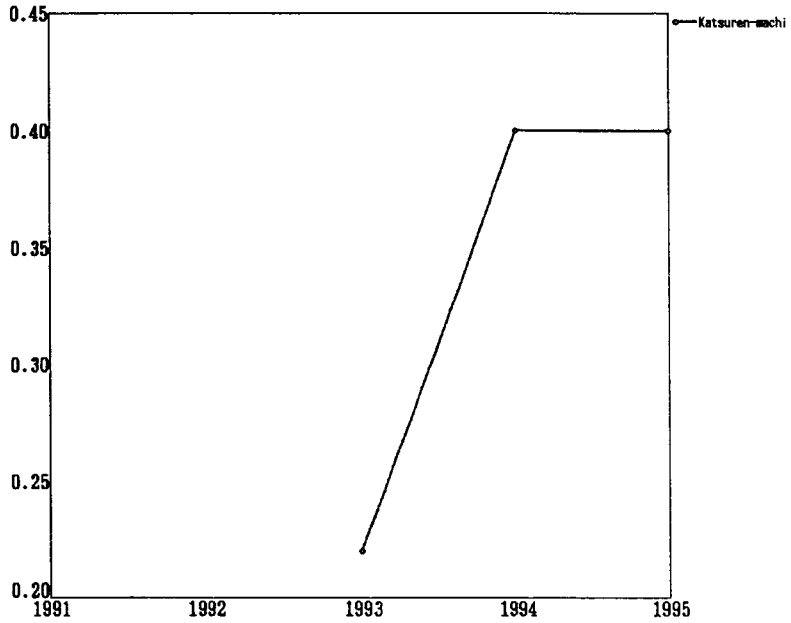

Fig. 7

* * Sampling Locations in Japan * *

1: Sapporo
2: Aomori
3: Morioka
4: Akita
5: Sendai
6: Yamagata
7: Fukushima
8: Niigata
9: Mito
10: Utsunomiya
11: Chiba
12: Urawa
13: Shinjuku
14: Maebashi
15: Nagano
16: Yokohama
17: Toyama
18: Kouhu
19: Kanazawa
20: Shizuoka
21: Gifu
22: Fukui
23: Nagoya
24: Tsu
25: Ootsu
26: Kyoto
27: Nara
28: Osaka
29: Tottori
30: Kobe
31: Wakayama
32: Okayama
33: Matsue
34: Tokushima
35: Takamatsu
36: Hiroshima
37: Kochi
38: Matsuyama
39: Yamaguchi
40: Ooita
41: Fukuoka
42: Saga
43: Kumamoto
44: Miyazaki
45: Nagasaki
46: Kagoshima
47: Naha