

**ROUND TABLE DISCUSSION**

by

**The Survivors of the Nagasaki Medical College  
Relating their Personal Experience with  
Atomic Bomb Victims in Nagasaki**

**NAGASAKI MEDICAL COLLEGE**

**June 7, 1950**

## LIST OF PERSONS PRESENT AT THE MEETING

### A-Bomb Survivors :

DR. SHIRABE, Prof. Surgery (presiding over the meeting)  
DR. IMAFUKU, Asst. Pharmacology (student at the time of bombing)  
DR. YAMURA, Asst. Dermatology ( " " " )  
DR. ODACHI, Asst. Surgery ( " " " )  
DR. SUGIHARA, Asst. Pathology ( " " " )  
DR. ISHIKAWA, Asst. Anatomy ( " " " )  
DR. UMOTO, Asst. Pharmacology ( " " " )  
DR. SHO, Asst. Surgery ( " " " )  
DR. SHEE, Asst. Radiology  
MR. KAWAMOTO, Pharmacist  
MR. YOKOO, Cook  
MISS MURAYAMA, Chief Nurse  
MISS HISAMATSU, Asst. Chief Nurse

### Others :

DR. KAGEURA, Dean, Prof. Internal Medicine  
DR. HIROSE, Prof. Ophthalmology, Director of the University Hospital  
DR. TSUJI, Lecturer, Surgery

### Guests :

DR. J. N. YAMAZAKI, M. D., Pediatrician, ABCC  
DR. S. J. KIMURA, M. D., Ophthalmologist, ABCC  
DR. W. J. SCHULL, M. D., Geneticist, ABCC  
DR. S. TAKESHIMA, M. D., ABCC (acting as interpreter)



DR. SHIRABE (Presiding): You have been asked to attend this meeting because the first-hand informations of our experiences of the atomic bomb are desired. I'm wondering what would be the best way to conduct this meeting. I think I'll ask you to relate your actual experiences individually. Dr. SCHULL and other doctors may wish to ask you some questions, too. Let me introduce you to the doctors. (Introduction of individuals present).

DR. TAKESHIMA: The ABCC physicians wish to thank you for giving your valuable time making this meeting possible.

DR. KAGEURA: I will relate my experience. I didn't actually experience the

atomic bomb explosion because I was at the time in Isahaya, in the Teachers Sanatorium of which I was the director. It was a little after 11 o'clock that day. I had just related to the people in the sanatorium what I had heard about Hiroshima—a flash and houses crumbling and people dying—and was about to start examining patients when there was a flash. A moment later there was a dull and faint sound as of a distant thunder and presently we saw smoke rising in the sky over Nagasaki. When I looked out about midnight it looked as if the city was on fire. As I was not on the spot in Urakami I cannot give accounts of anything directly connected with the explosion.

DR. SHIRABE: You went out for relief work from the next day?

DR. KAGEURA: Yes. Of course no drug was obtainable and the only thing we could do was to gather the injured people and give them water to quench their thirst or give some simple injections. I returned home in the evening to Nishiyama over the hill (east) from Urakami and felt very tired. The fatigue I felt then seemed to be different from the usual kind. I think this is about all I can tell you.

DR. SHIRABE: I think it would be better if I gave you a rough account of what happened in Urakami at the time. If you will then tell us your own experience, whether you heard any particular sound, or whether you were exposed to the blast, etc., and then what was done in a particular case, I think it will make the things easier to comprehend. I have a sketch map here (Fig. 1). The spot marked with a cross is the hypocenter. A survey made later by the Japan Physics Society shows the hypocenter about 50 meters more to the south-east. The red lines show 1, 2, and 3

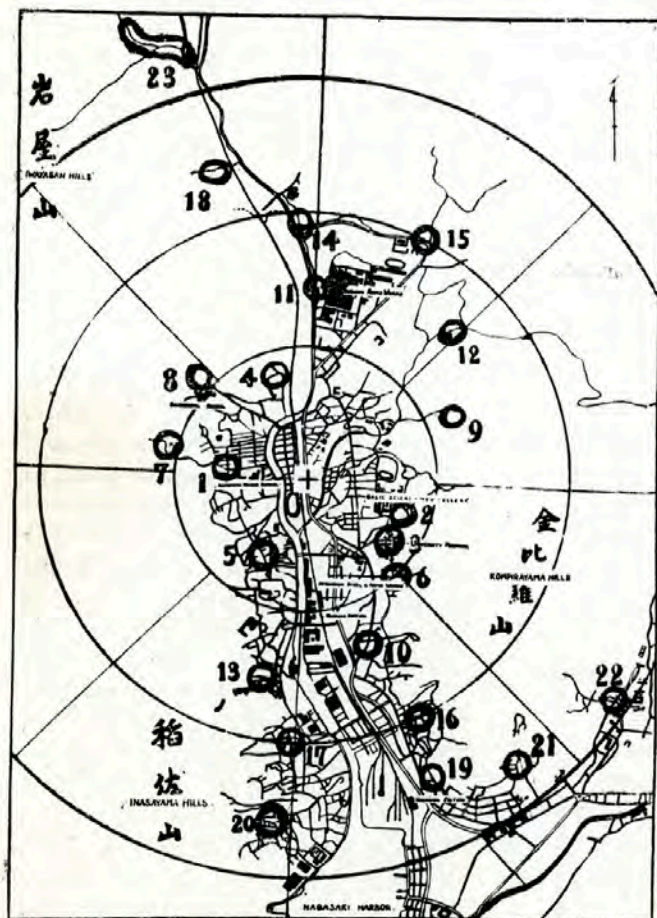


Fig. 1. Sketch of a Section of Nagasaki City within 3 km Area of Hypocenter.

Small Circles with Figures Indicate Location of Blocks Selected for Determining Death Rate (Fig. 4.) Cross Indicates Hypocenter.



km radii. The Medical College Hospital is about 800 meters from the hypocenter. But the class rooms for basic medicine were closer, about 600 meters.

These are hospital buildings (Fig. 2).

The thick black lines are concrete buildings. If I remember right, the air-raid alarm was given about 7 and called off about 9 in the morning that day. My room was on the second floor of the sur-

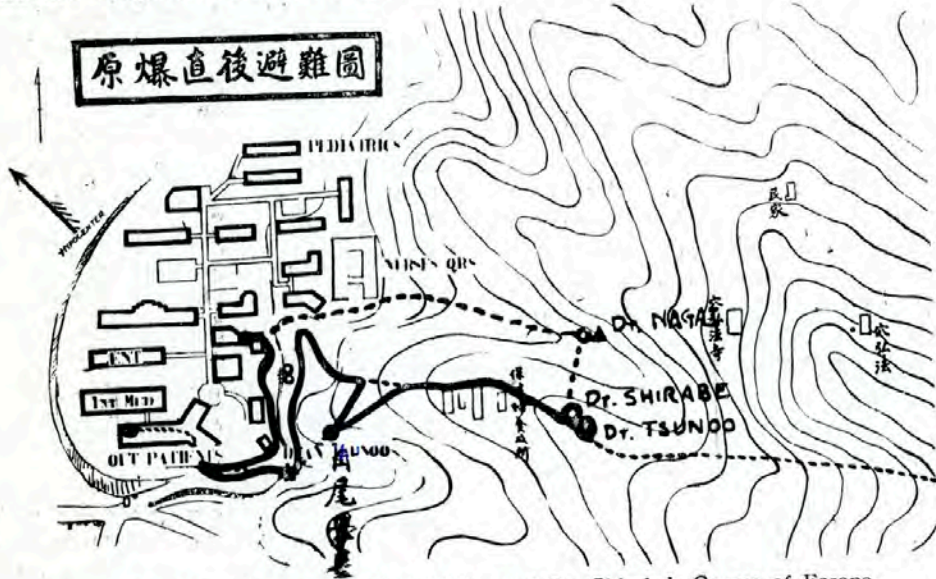


Fig. 2. Medical College Hospital Buildings and Dr. Shirabe's Course of Escape.

Straight Unbroken Line—Dr. Shirabe's Escapes Route.

Light Broken Line—Dean Tsunoo's Escape Route.

Dark Broken Line—General Escape Route to Nishiyama.

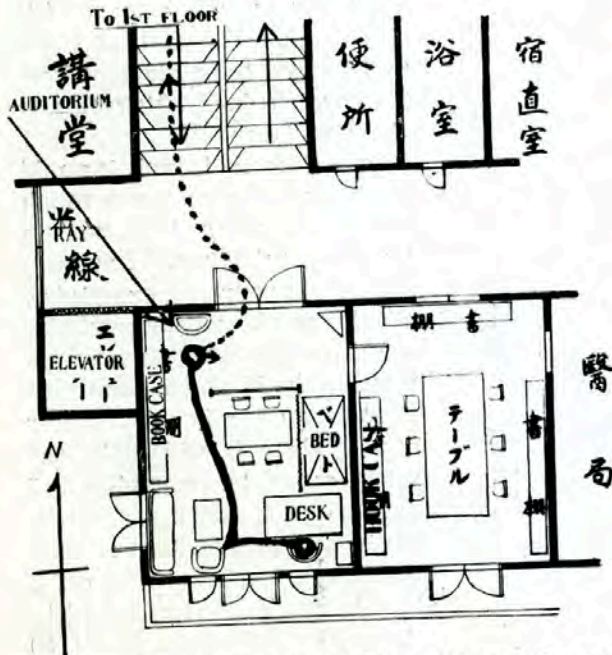


Fig. 3. Dr. Shirabe's office on 2nd Floor of Surgery Building. Line from Desk Shows his Route of Exit from Room.

gery building. I was writing at a desk in this room (Fig. 3) when, about 9:20, a student came in and reminded me of the lecture I was to give. I lectured till 10:00, returned to my room and resumed the writing I had begun. About 11:00 I heard a roaring sound which I thought was an airplane. So I stood up, put on my coat, and was about to walk out of the room when there was a flash. It was, I believe, a bright light, something like burning of magnesium. I squatted by the door and thought I heard some dull sound. Then came strong vibrations. I felt no blast at all. As the hypocenter lay to the north-west, the rays and blasts came from the direction of this arrow. I was protected by the walls and did not feel the blast. Some broken pieces from the ceilings hit me on the back. But as



they were of light material, they caused no injury. I stood up after a while but it was pitch dark and nothing was visible. Overhead I heard some rustling sound as of something blown up coming down again. When the sounds subsided I opened my eyes and saw that the room was in a real mess—desks, cabinets, and chairs smashed and overturned and covered by the debris that crumbled from the ceiling. My manuscripts, watch and the brief-case which had been on the desk were all gone. As I feared a second explosion I descended the stairs, walked out of the east entrance and on towards the out-patients clinic. But, as many people were coming out of that building, I joined and walked with them towards the top of the hill here (see chart). It must have been within half an hour after the explosion that I was on this hill. There I found, lying on the ground, injured, Dr. TSUNOO, the late dean of the Medical College. So I attended to him and we climbed to the top of the hill together. We spent the night on the mountain side with many others who were injured or severely affected by the radiation. However, we saw many of those who were not seriously affected walking back to Nishiyama-machi over Kompirayama. This spot marked red is where all people gathered and spent the night. I don't know exactly how many were there, but must have been about 500. The fire started soon afterwards. Might have been 10 or 15 minutes after the explosion. I noticed smoke rising from the nurses quarters which were built of wood. This is a very rough account of what happened.

DR. TAKESHIMA: Did you hear any sound of planes overhead?

DR. SUGIHARA: Yes. The plane must have been at a very high altitude. The sound was very subdued. Then I heard a sound as of a plane diving. Where were you then, Dr. Yamura?

DR. YAMURA: I was on the second floor of the clinic building.

DR. SHIRABE: This out-patients building has a passage running in the center

with rooms on either side. Most of the people in the rooms on the north side died but those on the south side survived. It was because the hypocenter was on the north-west side. Perhaps Dr. Tsunoo lost his life because he happened to be in a room in the north-west corner of the second floor.

DR. SUGIHARA: I was in the pediatrics building, in the veranda on the north side of the hospital buildings. (The pediatrics wing was the hospital building nearest to the hypocenter).

DR. SHIRABE: Very lucky you survived.

DR. SUGIHARA: Dr. Sho was in a room on the south side on the second floor of the ENT building. He survived.

DR. KAGEURA: He was in the library, wasn't he, on the south side? The ENT building stands on the north side of the out-patients building.

DR. KIMURA: If the distance was short, it is possible that the rays reflected from the internal medicine building standing on the south side affected the people in the rooms in the south side of the ENT building.

DR. SHO: There were three persons in this room and all three of them were saved.

DR. KIMURA: Perhaps the angle of reflection is the important thing. What was the causality in the hospital?

DR. SHIRABE: Various investigations were made of the students, nurses, and other members of the Medical College. The death rate for the hospital was 42.3% (Fig. 4). The death rate of the patients hospitalized in Medical College could not be determined.

DR. KIMURA: Did it rain?

DR. SHIRABE: Yes, it did. As I had lost my watch I couldn't state the exact time, but I believe it was about 4 or 5 in the afternoon.

DR. ODACHI: Wasn't it earlier?

DR. SHIRABE: May have been. As it was about noon that we climbed up the hill, it may have been about 2 p.m. Rained for about an hour.

DR. YAMURA: I don't think it was quite



that long.

DR. SHIRABE: No watch, just a guess. May have been half an hour.

DR. YAMAZAKI: Did it rain enough to moisten the ground?

DR. SHIRABE: Rained in large drops but not hard enough to wet the ground as when water is spilt.

DR. YAMAZAKI: Was it black in color?

DR. ODACHI: I think it was.

DR. SHIRABE: It may have been because of the dust. The sun appeared brick-colored at that time.

DR. SUGIHARA: It was as though looking through a veil. One could gaze and clearly define the outline of the sun without feeling the glare.

DR. SHIRABE: Weren't you taken ill afterwards, Dr. Yamura?

DR. YAMURA: Yes, I was taken ill about a month after. I did not have high fever but was laid up for about two weeks.

DR. SHIRABE: You didn't suffer, Dr. Odachi?

DR. ODACHI: No. Nothing went wrong with me.

DR. SHIRABE: Dr. Shee?

DR. SHEE: I had a slight fever about two months after. That was about all.

DR. SUGIHARA: Fever persisted for nearly a half year in my case. I was in the pediatrics wing at the time.

DR. ISHIKAWA: I was in a street-car in Yachiyo-machi, approximately 2,200 meters from the hypocenter. I did not have any bad effects.

DR. UMOTO: I had a sore throat and diarrhea for about a week.

DR. SHO: I had a slight fever and epilation. I was in the ENT.

DR. SHIRABE: Nurse Murayama was in the same building with me but in a room on the south-east side and suffered a burn. As there was a cliff at the back, the rays must have been reflected from it resulting in her burns.

MISS MURAYAMA: I was alone in my room. I lay face down as soon as there was a flash, but received burns in the face and on both arms. I don't remember how I got out of the room. My people

came to fetch me two days later and I went by train to a place called Oura in Kitatakagi-gun. I received medical treatments but my hair began to fall off. I was more dead than alive.

MR. YOKOO: I had just entered the outpatients building and reached the elevator when there was a flash. If it had been a moment later I would have been killed by the blast.

DR. SHIRABE: Were you not hurt?

MR. YOKOO: I was. About three stitches were needed to close a scalp wound. I had fragments of broken glass in my scalp and back but suffered no other ill effects.

DR. SHIRABE: I understand that Mr. Kawamoto was in Michinoo about two miles away. Were you outside or inside the house?

MR. KAWAMOTO: Inside. I fled towards the hill immediately after the explosion. But when I saw that Nagasaki was fire I began feeling uneasy about the Medical College and left home for the school about 5 p.m. When I came as far as Ohashi I found myself enveloped in a cloud of smoke and breathing became difficult. At last I managed to get to the top of the hill at the back of the hospital about 7 p.m. but returned to Michinoo that night. Diarrhea began about 23 August and grew worse until I was laid up in bed. But it began to improve about the beginning of September and stopped about 3 October. I suffered quite a bit from the effect of radiation. It took me nearly two months to recover.

DR. SHIRABE: Any other symptoms?

MR. KAWAMOTO: Cough. I coughed out about a litre of sputum a day and grew very thin. I took my white blood-cell count and it was increased to 27,000. This was about 40 days after the explosion.

DR. YAMAZAKI: Could you please tell us the symptoms or findings in the patients you examined or as you experienced yourselves?

DR. SHIRABE: I will begin then. I had received no injury and was feeling very fit, so I engaged myself in treatment of patients. As surgery was my specialty, I



had quite a busy time attending to those who had burns or other injuries. But things were brought under control at last and I returned to my duties in the college on 3 September. That day I felt very tired and the next day I was laid up in bed. This was the 4th week after the explosion. I felt very tired and I could hardly walk or move. Then I noticed petechiae on my upper arms and on the thighs, small but numerous. As the patients with petechiae I had seen so far had all died, I wondered if it was to be my end, but they began to grow lighter after a week or so and I began feeling stronger. I had neither fever nor diarrhea and the appetite was fairly good, I think. The white blood-cell count taken on 16 September was about 2,400. This was over a month after exposure to radiation and after I had passed the worst stage of my illness. I was one of those very light cases. The recovery was also very speedy and I was able to walk and went to the naval hospital in Omura on 26 September.

DR. IMAFUKU: I sustained an injury and bled badly from it. I went back home to Fukuoka when I was a little better. I had fever exactly a month after and it rose over 102 degrees. As no cause was known an antipyretic was used for two days but with no effect. Then I vomited blood. So I told my family to be prepared for my death as I thought the end of my days was drawing near. The white blood-cell count was decreased to about 3,000. This was about 40 days after. All sorts of treatments were tried in the following one month.

DR. TAKESHIMA: You vomited blood?

DR. IMAFUKU: Yes.

DR. TAKESHIMA: It wasn't just vomitus?

DR. IMAFUKU: No. I also had a nasal hemorrhage. No diarrhea but I had bloody stools.

DR. ISHIKAWA: I went back to Hiroshima on the second night after encountering the atomic bomb. Not the city of Hiroshima but a place about one and a half kilometers away. About the 4th week my temperature rose to 99.00 to 100.00

degrees, but it wasn't anything much.

DR. SHEE: I did not feel anything wrong.

DR. SHIRABE: You are a strong man. Being a radiologist, it may be that your constant exposure to X-ray makes you immune to radiation to some extent.

DR. SUGIHARA: Diarrhea began about the 7th day with me, or was it about the 3rd day? Anyway, it took me about half a year to recover completely.

DR. SHIRABE: Dr. Sugihara was in the pediatrics building, the nearest to the hypocenter

DR. TAKESHIMA: Did you suffer burns?

DR. SUGIHARA: Yes, on the face and forearm. As I could eat nothing I just kept on drinking water but couldn't retain even water—I vomited as soon as I drank any liquid. Diarrhea began after I got back home on the 3rd day. The fever started on 14 August and stayed at 104.0 105.8 degrees for about 10 days. The course taken was similar to that in the case of typhoid. My hair began falling off about 10 days later and continued to fall until there wasn't any left on my head. Then I had a peculiar experience. I think it was about the 3rd week after the atomic bomb and my fever was just beginning to go down when I found that the lower half of my body had become suddenly immovable. For about a week I couldn't even move my legs, though the tactile sense was not lost. I believe mine was a very rare case.

DR. SHIRABE: How long did it last?

DR. SUGIHARA: I recovered in a week. I could lazily move my hands, but my legs felt very heavy and I could not move them.

DR. KIMURA: Sort of "lost your legs" as they say in Japan.

DR. SHIRABE: It wasn't debility?

DR. SUGIHARA: No, it wasn't. As it came all very suddenly, I thought I was perhaps going to die and made my last will, etc.

DR. TAKESHIMA: What was your white blood-cell count?

DR. SUGIHARA: I think it was 4,800, taken on 3rd day of my arrival in Hiro-



shima.

DR. UMOTO: I, too, went back home. I suffered from loss of appetite and a sore throat, and diarrhea continued for about a week. I had no other symptoms.

DR. SHIRABE: Umoto was in the same room with Sugihara.

DR. UMOTO: Yes. After going back home to Iwakuni I had a fever, about 102 degrees for about a week. As no cause was known, I took an anti-pyretic but without any beneficial effect. About the second day of the fever necrosis of the gum was noted. My doctor thought I had the old disease I'd had in Hiroshima, so I took vitamin C but it had not beneficial effect. I don't think I had diarrhea. I recovered after two weeks' illness. Perhaps the blood transfusion I had did some good. Epilation was about 80%. It was difficult to tell whether the hair I had left on my head was what remained of the old stock or a new growth.

DR. SHO: I had no injury. A feeling of languor and a mild diarrhea after a month were about all I experienced. The white blood-cell count taken at a later date was approximately 2,000.

DR. KAGEURA: How long afterward was that?

DR. SHO: A little over two months after the explosion.

DR. KAGEURA: That was very low.

DR. SHO: Yes. That was what the person who had taken the count said. I had four blood transfusions from my brother. That is about all with me.

MISS MURAYAMA: Things didn't look serious at first. When the burn I had suffered was healed I began to have a sore throat with a little bleeding. Then the stomach-ache began and diarrhea started two or three days after that. I also had entero-hemorrhage. It was simultaneous with the diarrhea and was quite a bad one. This condition lasted for about a week. Then I was considered hopeless and was carried back home over seven miles of road on a stretcher. Perhaps this acted as stimulant. The

condition changed suddenly for the better from the next day.

DR. SHIRABE: You turned completely bald?

MISS MURAYAMA: I lost hair only on the sinciput.

MISS HISAMATSU: I sustained no injuries and no particular symptoms appeared.

DR. SHIRABE: I treated many patients. The people who were crying "Help! Help!" or "Give me some water, Mother!", when they escaped to the hill about an hour after the explosion, died soon afterwards. Then there was a student who was badly wanting to ease nature. It must have been diarrhea. This was only an hour or so after, so it may have been the earliest symptom. Dean Tsunoo was brought up on another person's back and vomited about four times. As he vomited each time he moved, I thought at first he had cerebral anemia. But that also must have been an early symptom of the radiation disease. Those in serious condition looked very weary and exhausted, and complained of some oppressed feeling in their chests. They had not lost consciousness. Such persons did not live long. Some persons began to suffer from severe diarrhea about three days after that. At first I thought it was dysentery. We discovered later that the diarrhea was caused by the atomic bomb, but those people, too, are all gone. As for the fever, the temperature-about 104 degrees-continue without abating and, according to the patients, without causing perspiration. Those patients died quickly. The skin had also lost its usual color and luster.

DR. KAGEURA: Yes. Most of them had lost the usual luster, but not in all cases, of course.

DR. KIMURA: How many were there in the Medical College all together?

DR. SHIRABE: Roughly 1,600, I think—students, nurse, and clerks. The death numbered over 850. As is shown in Fig. 4, the death rate for the Medical College Hospital, inclusive of students, nurses and doctors, was approximately



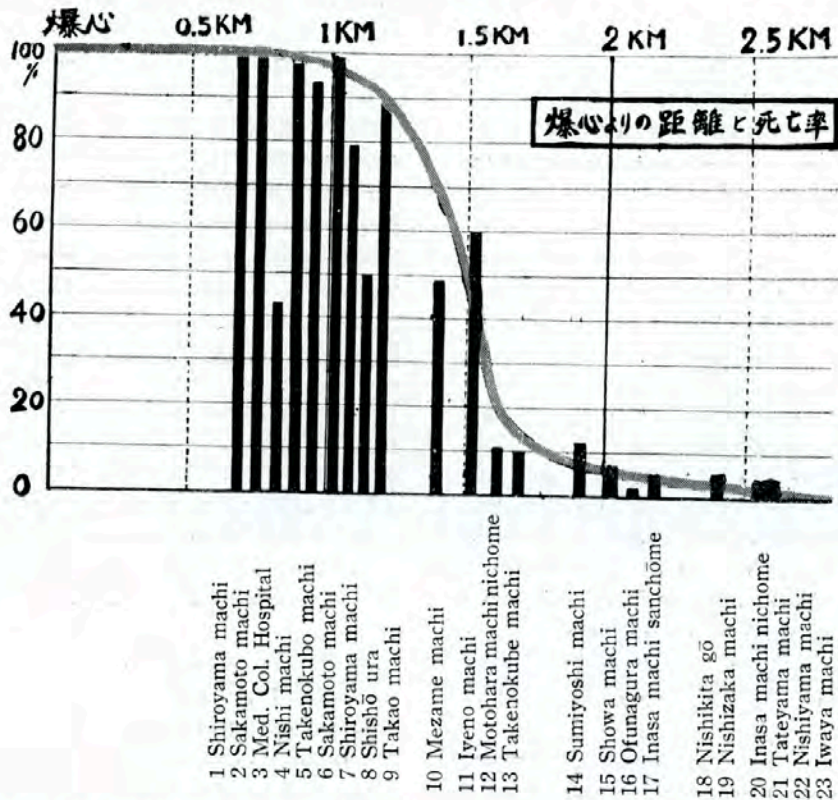


Fig. 4. Death Rate of Persons in Different Localities and at Increasing Intervals from Hypocenter. Investigations were made on blocks of 50-100 population comprising a war-time neighborhood association. (see Figure 1.)

43%. The medical students and faculty in the basic science buildings *all died*.

DR. TAKESHIMA: 43% of the people who were in the hospital building died?

DR. SHIRABE: Yes. This includes instant deaths. Some were killed by the large beam that fell on the passage.

DR. ODACHI: My companion was killed that way.

DR. SUGIHARA: They say in Hiroshima more people were killed by the ceilings falling on them than by the radiation disease.

DR. SHIRABE: Here more people died from burns and radiation effects than from external injuries.

DR. SHEE: Death for those in the passage must have been instantaneous.

DR. SHIRABE: Those who were outside and were directly exposed to radiation incurred burns over nearly the entire

body and died on the spot.

DR. KAGEURA: Did many people die outside?

DR. SHIRABE: No, not so many. When I went out to the ground I saw about 10 dead bodies of nurses and students.

DR. TAKESHIMA: How many days after the atomic bomb did the earliest deaths occur, not the instantaneous deaths but the radiation deaths.

DR. SHIRABE: Prof. Takaki must have been one of the early deaths. He died two days after. *Figs. 5 and 6* show the times of deaths—the deaths that occurred after the patients were moved to some kind of shelters—, and do not include instantaneous deaths. *Fig. 5* shows the deaths occurring in various institutions in the City of Nagasaki and *Fig. 6* shows those occurring in Omura naval hospital, Kawatana Kyosai hospital, and a school



原子爆彈受傷者'死亡時期

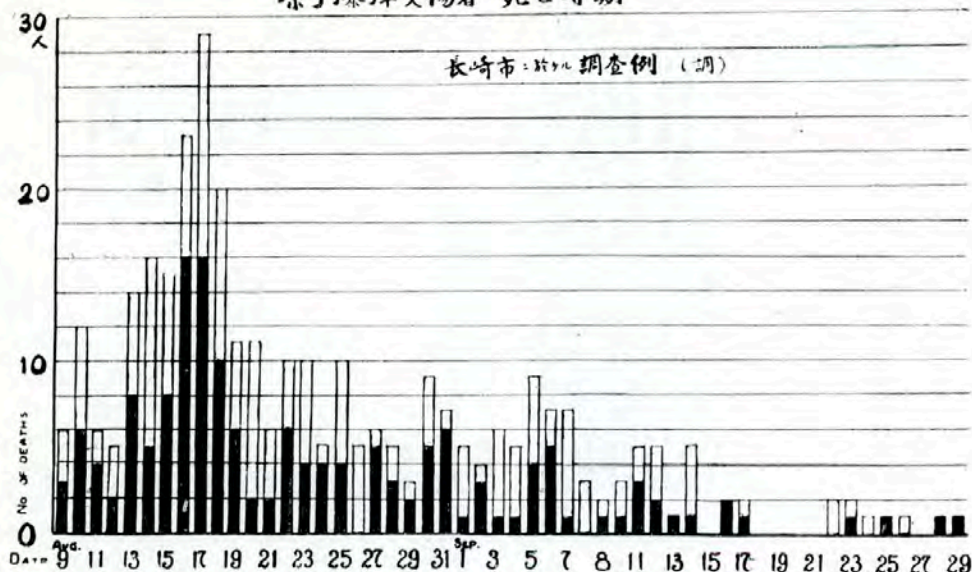
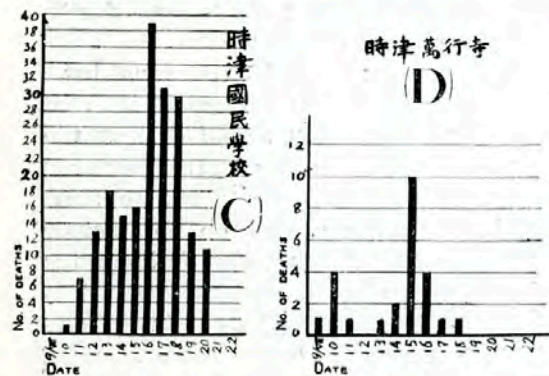
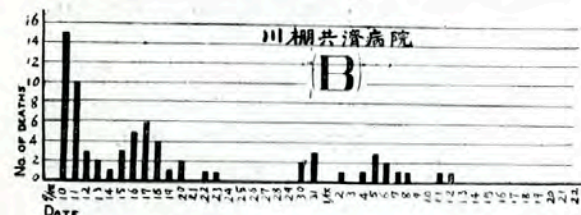
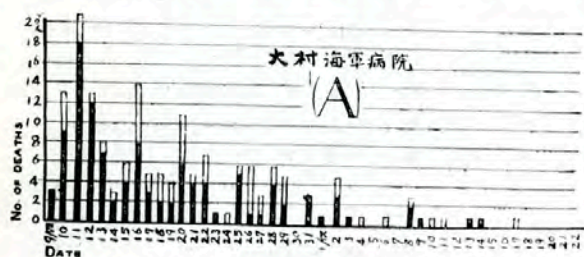


Fig. 5. Deaths Occurring in Individuals Exposed to A-bomb at Various Institutions in Nagasaki City Where Patients were Hospitalized.

The chart shows the result of investigation of 333 deaths.  
Black sections indicate—males. Light section indicates—females.



and a temple in Togitsu.

Some deaths occurred on 9th evening, but 3rd and 4th days and 7th day show most deaths. They were undoubtedly deaths from radiation disease and, although they may have included some cases of burns or injuries, the burns or injuries were not the fatal causes. The number of deaths decreased gradually after a weeks. People who were evacuated out of Nagasaki died earlier than those who remained in the city. For instance, the death rate is higher among the patients removed from Nagasaki to Omura naval hospital or Kyosai hospital in Kawatana. So I am wondering whether transporting or moving of such patients influenced their early deaths.

DR. ODACHI: Yes. That may have been the reason that more of the people

Fig. 6. Death Occurring in Individuals Exposed to A-bomb at Various Institutions Outside Nagasaki City Where Patients were Hospitalized.

- (A) Omura naval hospital.
- (B) Kawatana kyosai hospital.
- (C) Togitsu grade school.
- (D) Togitsu Mangyoji.



staying the night on the hill survived than those who went back home the same evening.

DR. SHIRABE: In Togitsu the worst was about a week after. The difference may have been due to the amount of radiation or to some other factor, but it shows that the radiation disease reaches the most dangerous stage in about a week's time, I think. Most of the persons who died later usually had some complications. In most cases death from irradiation occurred within a month.

DR. TAKESHIMA: What about the people who were in dug-outs?

DR. SHIRABE: In dug-outs, those who were near the entrance were either killed or became ill. Those who were further in were saved.

DR. TAKESHIMA: How did the wooden houses stand up?

DR. SHIRABE: They just crumbled and burnt. They afforded no protection at all. I went afterwards into the lecture hall that was in a wooden building and found my son pinned and killed with many others by the roof that had fallen on them. For some unknown reasons they were huddled together in a small group when the roof fell, for their bodies were found piled up in a heap.

DR. KIMURA: There is an interesting story. In Hiroshima some of the children were having a diving contest and a boy who happened to be underwater when the atomic bomb fell was saved while five others who were out of water were killed.

DR. SHIRABE: That sort of things happened here too. Those who were swimming and happened to be in water were saved.

DR. TAKESHIMA: What were the earliest symptoms of radiation sickness?

DR. SHIRABE: In the early stages, fever vomiting and diarrhea. Some persons showed these symptoms the same day. Shock-like state was also a very early sign noted on the first day.

DR. ODACHI: Then the loss of appetite. Very few could eat that day. But those who did eat were saved. Of course some

were probably too ill to eat anything.

DR. SHIRABE: Yes. Regarding the shock, Dean Tsunoo appeared ghostly pale and couldn't even speak properly at first. He was made to lie down on the hill and began to show some color towards evening.

DR. IMAFUKU: And loss of consciousness, too, I think, as one of the early signs. Some remained so for several hours. Many persons could not remember in just what manner they made their escape and finally reached a place of safety.

DR. UMOTO: Such cases happened in Hiroshima too, they say.

DR. IMAFUKU: I heard that some deaths occurred to persons who returned to Nagasaki about a week after the atomic bomb explosion. Did radiation have anything to do with those cases?

DR. ODACHI: Soon after the explosion I was in Urakami for about a week, but I did not become ill at any time.

DR. SHIRABE: Dr. Barnett, a pediatrician who was a member of the U.S. Atomic Bomb Casualty Investigation Commission visiting Omura Naval hospital, said such things could never happen. He maintains radiation is momentary and says no effect will be felt by anybody going to the sort after the explosion as there will be no more radioactivity then. But I rather think the radiation remained for some time in Urakami. I think it is not impossible.

DR. ISHIKAWA: I heard that in Hiroshima some deaths occurred among the people who went to help their relatives or members of fire-brigade or youth association who assisted in the disaster after the explosion of atomic bomb. The people from the U.S. denies the possibility, but the symptoms are similar.

DR. SHIRABE: I agree. Of course some felt no effect at all, but there are also some who stayed for some time and showed radiation sickness symptoms. There might be constitutional predisposition too, besides.

DR. YAMAZAKI: Recently I took a history from a young woman who stated that she was in the country at the time



of the bombing and returned to Urakami the day after the bombing to look for members of her family. She returned to Urakami each day for 6 days following her first visit and on the 15th of August she finally found the surviving members of her family. Her search took her across the hypocenter in an area 1,000 to 1,500 meters north and south of the hypocenter. Vomiting developed about the 12th day. About one month after the atomic bomb, she developed gingivitis with bleeding, followed by sloughing of her gums. Petechiae appeared on the skin of arm and thorax. Fever developed about this time. These signs and symptoms persisted for about a month.

DR. ODACHI: There are some people who, like myself, remained on the spot for a long time after the explosion and yet did not die. Do you know what happened to people who ate pumpkins grown in the gardens there at the time?

DR. SHIRABE: I ate potatoes. Potatoes were grown in abundance there and I dug some out, washed, and ate them raw. I didn't notice or feel anything unusual afterwards. The wind was blowing from the southwest direction. When I first went up the hill the smoke from the burning buildings was blown towards the hill, but in the evening the wind changed and began blowing from the hills (N. E.). But this was only for a short time and the direction changed to south-west again.

MR. KAWAMOTO: The wind changed from south to north for about an hour in Michinoo side. It may have been due to the fire.

DR. SHIRABE: A good amount of radiation rays may have been blown to Nishiyama side, with the dusts. Some Americans mentioned this too.

DR. SHEE: I hear the dust in an eaves-trough of a house in Nishiyama was found to contain a considerable amount of radioactive material.

DR. YAMURA: In his lecture on radiation, Dr. Nagai said that the trees of the upper part of Kompirayama Hill were discolored, turned yellowish, showing that

the radiation remained. I heard this from a person who had heard the lecture.

DR. ODACHI: Some large trees were blown off by the blast.

DR. TAKESHIMA: Did you ever notice in examining patients any specially notable symptoms arising from the atomic bomb?

DR. SHIRABE: I don't think I did.

DR. KAGEURA: There wasn't any other.

DR. TAKESHIMA: Were there any unusual mental reactions?

DR. IMAFUKU: I saw a student moving aimlessly towards the main building, the houses in the streets were burning furiously at the time. Then I saw a nurse walking towards the bent chimney-stack. As it didn't look safe, I took her up-hill almost by force. I saw quite a number of people like that.

DR. SHIRABE: Those were immediate reactions, were they not? Delayed reactions were not common.

DR. SHO: I know of a person who stated that his entire body became so sensitive about six months after the bombing that he felt pain even when he was putting on his clothes.

DR. YAMAZAKI: Are bullous impetiginous type of skin lesions common in Japan during the summer months?

DR. SHIRABE: No, but they were fairly common the first two or three summers after the atomic bomb.

DR. ODACHI: The cases appeared to take longer time to heal than in ordinary times. It may have been due to radiation, or perhaps it was due to poor hygiene during the post war years. There were some simple cases, too.

DR. YAMAZAKI: Could you tell us your experiences with keloid formation that occurred in bomb victims?

DR. SHIRABE: Because of the shortage of drugs, oils-vegetable-seed oils mostly-were used for burns in the beginning. I wondered whether the vegetable oils might have been the cause of the keloids. I considered various forms of therapy. Many of those operated upon early had recurrences. After about two years the chara-



cter of keloids that remained improved, becoming softer and thinner. From many observations, I concluded their formation to come from the constitutional differences resulting in different degrees of endocrine responses. Perhaps the thyroid gland is affected. Such a reaction may have produced the keloid; the keloid grew smaller and recurrences became less frequent as the effect of radiation on the endocrine system wore off. Of late, patients with keloids requiring operation are not as before. Except in cases of people who have tendency to form keloid formation is a passing phenomenon in patients exposed to the atomic bomb.

DR. KAGEURA: What became of that patient who had a large yellowish "shell" on his back?

DR. SHIRABE: Improved gradually. The keloid in the ankle joint was operated on and cured completely, but the one on the back was too large for operation. I heard X-ray was sometimes used in treatment of keloids. No X-ray was tried on this patient but the keloid began to heal spontaneously and the lesions have improved considerably in respect to size, thickness, and consistency.

DR. KAGEURA: A passing constitutional variation, probably.

DR. YAMAZAKI: Does the tendency for the keloid to disappear vary with sex or with age?

DR. SHIRABE: I have statistics, but don't remember the details.

DR. YAMAZAKI: Did children have them too?

DR. SHIRABE: Yes, they had it too. But I thought recovery was quicker with them.

DR. KIMURA: What about the relation with the color of the skin. In the United States it is said that keloid is more common among negroes.

DR. SHIRABE: The difference between the fair and the dark among the Japanese who are of the yellow race is not very marked, and consequently no remarkable variation arising from the complexion of patients was noticed. The difference arising from the sex, age, or region was more

noticeable, I think. Dr. Tsuji, which of the sex had it more, the male, or the female?

DR. TSUJI: The same, I think.

DR. SHIRABE: In age?

DR. TSUJI: The greatest evidence occurred between the ages of five and ten and between fourteen and twenty—in two age groups. It may also depend on the type of investigation made. In our case the investigation was made mostly with school children. (No study was conducted to determine the age incidence of keloid formation.)

DR. SHIRABE: It was more frequent among young people?

DR. TSUJI: Yes, and the healing was speedier with the children and the size diminished in shorter time.

DR. TAKESHIMA: What was the distance with the worst effect?

DR. SHIRABE: In most cases keloids developed in individuals with burns who happened to be at a point from one to two kilometers from the hypocenter. The relation of the severity of the keloid to distance is not very clear. More cases of keloid were seen among young people than among old people.

DR. TAKESHIMA: What form of therapy was given? No doubt many forms of it must have been tried.

DR. SHIRABE: Yes, all sorts, it seemed. Vegetable-seed oil was a popular therapy for the burns. We used oil too. For the radiation sickness some prescribed vitamin C. Some tried blood transfusions and glucose injections. Then protein was reported to be specially effective and people began taking dried cattle, fish or bone soups. I had ox-bone soup myself and thought it really did me good. There must have been quite a variety of popular treatments. You know any of them, Mr. Kawamoto?

MR. KAWAMOTO: No, I don't know anything about them.

DR. TAKESHIMA: I heard some people did not get keloid just because they went to hot springs.

DR. SHIRABE: In our experience keloid formation did not occur which the ulcer



resulting from burns had been treated with penicillin ointment. Then we heard that alcohol was very effective for radiation patients. Perhaps a good drink and also a good therapeutic agent. Prof. Takase told us that in one case a patient who had been given glucose injections initially was given a 40% alcohol injection when the glucose ran out of stock. This seemed to have acted favorably and the patient continued to receive the injection with a satisfactory result. It is reported that all who had glucose injection died while those who had alcohol injection were saved. In another instance a man drank alcohol out of despair and this man escaped death. I myself had some sake when in sick-bed and feeling very much depressed and felt very much better for it. I have heard of many such instances. I believe it would give some interesting results if we could carry out experiments along these lines to substantiate our clinical impressions.

DR. TAKESHIMA: Do the injection of alcohol have the same effect as when a person imbibes alcoholic beverages?

DR. SHIRABE: They say it produces a very pleasant sensation. In my case I drank sake. While in sick-bed I was feeling so languid that I didn't even feel like talking when friends came to see me. But when I drank sake, I was greatly invigorat-

ed and did not feel tired even after talking for some time. I believe that did me a lot of good. Then I had vitamin C injections, but I don't know if that did me any good. What was done in Hiroshima, I wonder?

DR. TAKESHIMA: For burns mercurochrome, or potato or cucumber juice was used as liniment. Oil was also used. That was about all, I think.

DR. SHIRABE: Many of the deaths may have been due to sepsis secondary to combined effect of leucopenia and wound infections but of course no facilities were available to carry out bacteriological studies. Aren't they carrying out studies on the treatment of irradiated patient in the United States? Something must have been achieved by now as a therapy for radiation sickness.

DR. YAMAZAKI: Antibiotics have helped to prevent infectious sequelae which seem to be so prone to develop when the body receives large doses of radiation. Preliminary reports on the beneficial effect of vitamin P have also been reported. I believe many investigations are in progress. Thank you again for giving us your valuable time today and giving us such an interesting and informative afternoon. If ever there is anything we can do for Medical College, we shall be only to pleased to cooperate.