

were also different. Also the importance of how each organ related to life was also different. At present, other organs were not assessed seriously. Thus, it would be wrong to classify these disorders according to body system type, e.g. digestive system type or blood type. If a patient with digestive disorder lived longer, instead of dying in the early stages, he or she might develop a blood disorder. There are the disorders of two organ systems combined.

Also, taking a good look at late onset blood disorder patient, we see that these patients were going through mild digestive organ disorders. It wasn't serious enough to warrant attention because the symptoms were mild. Everybody developed symptoms in this order: whole body, digestive organ, and then blood disorder symptoms.

Then, there were these questions: the digestive organ disorder progressed mildly, but why was the blood disorder severe and was this difference due to the sensitivity of the different tissues? Disorder to the digestive organ caused mild symptoms, but symptoms of disorder to the hematopoietic organ caused fatal changes.

The patient who received large doses of irradiation developed severe symptoms and got sick early, but those who received small doses had only mild symptoms. Thus, it would be useful to classify the doses of radiation as follows : large, moderate, and small.

### **Determination of prognosis, radiation doses**

The relative importance of symptoms was determined by radiation doses, constitutionality, age, and extent of health. The irradiation dose is the most important factor though. The fate of almost all patients was decided by this factor. Other factors had very little effect. For example, I had one case of six patients in a family with early onset digestive organ disorder. They all died on the same day even though there were some variances in terms of health, age, body constitutionality, and convalescence environment.

The speed of progress was almost constant if the members of a family received the same large doses. The time of death was the same if the family received the same doses of irradiation at the same place. For the people who received more than lethal doses of irradiation, any kind of treatment was to no avail.

### **Distance**

The strength of radiation doses was determined by the distance of the victim from the bomb, the body surface area exposed and infiltration, as well as the residual radioactivity. The duration the victim stayed in the hypocenter is also clearly relevant. The bomb was exploded in the air; therefore, the distance from the point of explosion cannot be measured in terms of horizontal distance. That distance would need to be calculated with trigonometry. The most important exact point of the hypocenter and the high point of the epicenter are estimates. These calculations are

meaningless.

### Penetration

Penetration of substances is another important consideration. The penetration of the substances by radiation was related to its element, thickness and density. On the other hand, the penetration power of the radiation was also a factor. In this case, people shielded by a concrete wall received only mild injuries.

Our members of the 11th Medical Corps were in the hypocenter. Yet, we received relatively milder radiation injuries compared with that of our university colleagues. One explanation is that we were shielded by several thick concrete walls.

Also, we worked in the radiation room, constantly exposed to radiation.

Regarding shelters, we think the thickness of the cover, the nature of the soil and its moistness had a great effect on the penetration power of the radiation.

The severity of symptoms in terms of age was also clearly demonstrated. Children developed severe reactions. There were many families left with only old people living and young people dead in the same family.

We shall compare X-ray irradiation for medical use and atomic bomb primary radiation.

Differences in irradiation		
	Atomic bomb	X-ray
Frequency	Once	Once or divided
Duration	Momentary	A few minutes to about 20-30 minutes
Doses	Very large amount	Below lethal dose
Type of wavelength	Mixed wavelengths	Within the same wavelength
Distance	Far (several hundred meters)	Short (20-30 centimeters)
Infiltration	Indefinite	Constant
Radiation area	Whole body	Lesion
Object	To kill people	To save people

Irradiation by the secondary residual radioactivity in small continuous doses results in whole body irradiation. This type of irradiation resembles radium radiation. Speaking in detail, this is a radium emanation bath, like repeatedly taking a hot spring bath in radium irradiated waters.

The people spoke about their radiation disorder in terms that they had "drunk the blast wind," that they had "aspirated a gas." These beliefs stemmed from the idea that all illness enters the human body from the mouth.

People had no knowledge of radiation, how it could get inside the body without stimulating sensory nerves and causing disorder. People thought that sick people got ill from chemical poisoning caused by the radiation, and a so-called "detoxification treatment" was called on for this physical disorder.

### SECTION 3

#### **Treatment**

Stimulation therapy by auto-blood transfusion was retested and good results were realized. The mechanisms of this therapy must be studied in future. We would like to try auto-blood transfusion therapy on patients who developed leukemia as a result of clinical X-ray or radium irradiation.

Superstitious therapy was not carried out. There is no mystical way to go against the genius of science (the atomic bomb). The general population raised their scientific standards during the war.

## CHAPTER 9

### Review

#### SECTION 1 Preparedness

##### **Leaders' mistakes**

Nagai had been instructing the review and relief operations of the Civil Defense Corps at the request of the Nagasaki Prefecture Civil Defense Department since 1940. In retrospect, he recognized that he was completely mistaken at the end of the war. He asks to be pardoned and assume responsibility as the leader.

Namely, Nagai emphasized the importance first of external injuries, the second poison gas, the third microbiological warfare, and was instructing within this scope, but never considered the atomic bomb. The medical leaders in general were working at the direction of the Interior Department. Their responsibility was to just go back to the Interior Department, but Nagai had majored in Radiology, a field related to the atomic bomb and did not study countermeasures against atomic bombing, therefore, he did not give rescue instructions concerning such an attack.

This poor judgement of our leaders, their obstructive perspective, insufficient study of the enemy, and smugness were exposed, and he blames himself for the defeat of the war. Now, he feels amazed and ashamed to be a leader without knowledge of the enemy, for having spoken so arrogantly and without humility. Furthermore, the situation was not stopped by his confession. Tens of thousands of lives were lost. How can he compensate for this responsibility?

From ancient times, the enemy's winning of a war was dependent on the use of an unknown weapon. This time Japan was completely surprised by the atomic bomb. Did our intelligence get any information? Also, after the bombing of Hiroshima, why was the true picture not caught up with yet? The leaders were surprised to see the effectiveness of the bomb, which was to end the war. Yet, instead of telling the people the truth and giving warning, the government simply announced that, "Hiroshima was bombed by a new type of bomb, that there was substantial damage." Why did the government make this announcement, which was like a rumor in another country? Well, he may be like a soldier of a defeated army talking like a commander who should be blamed.

##### **The university**

There are people who said that the staff of the university and its resources

should have been scattered, distributed, and stored. But, this is just talk in retrospect. We didn't have any concept of the atomic bomb. We were rushing for lectures, studying, as well as preparing defenses for an air raid all at the same time.

How was the defense of the university? That day, the air raid warning had just been turned off and a lecture had already begun. On civil defense duty in the hospital was the 6th (Shirabe Surgical Department), the 10th (Psychiatric Department) and the 11th (Radiology Department) Medical Corps. Professor Shirabe took command for the sick absence of Professor Takase of Psychiatry, and Associate Professor Nagai and Associate Professor Kido were under his command. We were well prepared for an ordinary bombing.

Two medical college students with alarm bells as surveillance stood watching the sky on the hill behind the university. We heard the two students shouting, "A strange looking plane is intruding," repeatedly, but in the next moment there was the loud engine sound of the plane accelerating, then Pika ! The world ended.

## SECTION 2

### After the bombing

#### **An unguarded moment**

It was at mid-day during mid -summer. It was hot. Because the air raid alarm was called off, everybody relaxed and took off their heavy air raid clothes and helmets. Then we were attacked by surprise. The wounds were severe. People tried to get dressed but their clothes were buried under the debris or blown up and they could not find them. The people who jumped out without wearing shoes were wounded by stepping on nails.

What was the use, preparing air raid clothes for so long? Poor security is the greatest enemy. Our preparation didn't work at the most important time.

#### **Judgement of the situation**

At the moment of explosion, we did not lose consciousness. We were thinking calmly. Everybody thought the bomb had exploded nearby. And we were thinking about what to do while buried alive. We could not expand our vision even after getting out from under the debris and looking outside. Namely, we were calm, but we didn't get the true picture. Thus, our activities after the explosion were not well suited to what had just happened.

#### **Equipment was not carried out**

If we had any idea that it was an "atomic bomb"... He still recalls his

memory with deep regret. If we knew, we would have taken out radiation measuring instruments under any circumstances. If we had them (particularly the Geiger counter), we could have measured the radiation close up right after the explosion and in the following intervals to get any valuable data.

If we had taken out photographic equipment, developing materials and film could have been taken out. We could have measured the sensitivities of exposure or took pictures of the patients. We lost this once in a lifetime opportunity. We must apologize to the scientific community.

Should we save the people or should we take out equipment, we were thinking for a while? While we were thinking, a few injured people crawled to our feet. He thought about this question again while trying to stop their bleeding. And he went into the room again. The room was in disarray. There was nothing he could do.

Large equipment could not be moved through obstructed passageways, small equipment had blown up and was broken. The fire had not closed in yet, therefore, he decided to save the people. And we started first aid for the injured. While we worked without knowing the time, we brought up the injured to the hill behind the hospital.

There was a person shouting, "The X-ray Room is burning!" He looked at the X-ray room, which was blowing out flames. It must have started to burn the film. Then every window flared up with flames. There were injured still in the basement. We rescued our colleagues one by one from the burning basement for the sake of human life, rather than for the equipment. But, what was the result? Almost all of the patients we rescued died. How many people survived? Our desperate rescue operation meant nothing.

If in any case, they were going to die, leave them alone. We should have brought out important measuring instruments. We might have saved tens of thousands of lives, but there was no choice. We just could not leave the injured people alone.

### **Rescue scene**

You may imagine that the rescue operation was carried out courageously and rapidly, but that was not the truth. Our activities were slow because we ourselves were wounded to some degree just after coming out from being buried and had no vital power. Also after complete evacuation of the hospital patients to the safe location, the injured continuously crawled up to the hospital from the town and collapsed in front of the entrance.

After we moved to the safe area, the fire closed in. Again, we had to move the patients to a safe place. We were getting tired. The patients complained. We had to listen to them. We had to go around to fulfill their requests. We were working with fatigue two hours later. However, the patients kept coming and coming. In retrospect, we break into a cold sweat now whenever we think of those patient cases. Our treatment was inadequate. We apologize for the water we gave to the dying patients,

such as a dirty pail of water.

We abandoned the patients overnight on the open farm field where it was safe from fire. We were human. We thought of ourselves only. That night we did not take care of the patients, but fell asleep, after we filled our stomachs eating pumpkins.

The second day was worse. We were lying down all day due to increased fatigue from radiation sickness. Furthermore, we did nothing for the critical patients moaning on the ground in front of us. Because no surgical supplies were left, we did not have the will to take care of them, only ask, "How are you?" and let them drink water or eat pumpkin. Please forgive me.

Nagai had several experiences of confusion on the battleground and duplicated previous lessons he learned about commanding subordinates. Therefore, he stood right in front of the entrance immediately after the bombing, and subordinates came along with the exception of five dead. The survivors, carrying the wounded, unified in all of five minutes. What happened to the other units of the rescue team? We saw the scene of defeat here.

### **Self-criticism**

We must recognize our failure as professionals in our activities. That was, we failed to warn people to evacuate from the hypocenter until it was safe to live as determined by the results of tests for residual radioactivity. We should have noticed that this was an atomic explosion and contacted the Kyushu University Physics Department for confirmation. Residents 500 meters away from the hypocenter should have been moved without delay. If we did, so many people sheltered in the hypocenter would not have been sacrificed later. This showed a fault of the scientists' lack of community consciousness.

### **Fear**

Even brave people once injured will become cowards. We were not particularly courageous people, this was especially true. From the instant the world had ended with the *Pika* to the small number of planes flying at a high altitude, we became so nervous that we jumped into a shelter every time, if even just one plane came. Our activities were interrupted quite often. The commander acted in this way. It could be criticized that the relief operation was conducted by a bunch of cowards. It was lucky that the war ended and that there were no more air raids. If the war had continued, what would our condition be? He imagines that it would have ended disastrously for the relief group.

Atomic bomb disease is an unprecedented new disorder. The research laboratories of the local university were totally destroyed. With the war's end, the Japanese Air force bombers had no more missions to perform. So, why did they not transport the many patients from Ohmura (Naval Hospital) to every university hospital in the nation with permission of the

Allied Forces? If we could have done it, how many patients would have been saved?

How much research was done? We regretted the research resources lost with valuable human life altogether.

Even regarding the question of blood transfusions, there were no unaffected donors without radiation disorder in Nagasaki City. Why is it that the national government didn't recruit blood donors from other cities throughout Japan? The activities of wartime national public health organizations were totally inactive. In this critical time, when executives were sent, they just chatted about their own memories of the bombing or conditions of their relatives and did not seriously discuss future projects.

From our own indecision, how many of our subordinates lost direction. Everybody did not know what to do. There were no clothes, no living accommodations, and nothing to eat. Staff members left us. Once the staff members had left us, there was no way to get back control. This was all the fault of the commanders, who had no experience of working together for life or death on the battleground. There are several things to be considered for working harmoniously and unified in the middle of a confused battleground.

First there should have been clear directions for the members to raise their spirits. Second, the responsibility of each member should have been clearly assigned. Third, the members' needs for clothing, food and shelter should have been fulfilled. Fourth, a ward and punishments should have been clearly defined.

We picked Mitsuyama and Nishiurakami to fulfill these conditions. The results were the almost complete achievement of the objectives.

We regret not making thorough rounds of the patients due to the members' getting wounded and ill with radiation disorder and falling into their sick beds one-by-one.