



### 3.19 EXTENSION LECTURES: THE EFFECTS OF RADIATION FROM ATOMIC BOMBING

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#### ABSTRACT

About 56,000 A-bomb survivors are living in Nagasaki city even today. Nagasaki citizens, whether they are A-bomb survivors or not, can not live without concerns on the existence of radiation effects. They have fears of any amount of radiation and are afraid that it may harm their life. As results of studies in the university on radiation effects are not familiar to the citizens, we have started extension lectures on "the effects of radiation from A-bombing" to them since 1990. We discuss the problems as well as significance of the extension lectures by reporting the details of the extension lectures which we have managed in the past.

#### 1. Introduction

About 56 thousand A-bomb survivors live in Nagasaki City today, and many people in the city are related to the survivors, including family including the second generation of survivors, relatives and acquaintances. People who have come into the city after a long time of A-bombing and who are not directly related to the A-bombing are also conscious of radiation from A-bombing. Unlike conventional bombing, A-bombing makes survivors, as well as citizens not related to the survivors and live in the city, afraid of its effects. However, studies performed in the university are not always understood by citizen. We have opened the first extension lectures on the effects of A-bombing in Nagasaki in 1990. From 1995 we have been planning the extension lectures every year.

#### 2. Opening of Lectures

Following 6 sessions were held since 1990 to 1998.

- (1) September, 1990: 5-day course of 1 hour 45 minutes on Friday
- (2) July, 1995: 3-day course of 3 hours on Friday
- (3) August, 1996: 1-day course of 4 hours
- (4) August, 1997, 1-day course of 3 hours

- (5) August, 1998, 1-day course of 3 hours
- (6) December, 1998, 1-day course of 2 hours and 15 minutes

### 3. Contents of Lectures

Following contents were included in the extension lectures performed in the past.

- (1) Character of Radiation:
  - Power of A-bombing
  - Radiation from A-bombing
  - Radiation and radioactivity
  - Radiation and active oxygen
  - Measurement of radiation: practice
- (2) Effects of Radiation on Human Beings:
  - Radiation and human cells
  - Radiation injury
  - A-bomb syndrome
  - Early effects of Nagasaki A-bombing
  - Late effects of Nagasaki A-bombing
  - A-bombing on Nagasaki and cancer
  - Fifty years of study on leukemia induced by A-bombing
  - Cellular damages induced by radiation and its defense mechanism
- (3) Health Control:
  - Medical data base of A-bomb survivors
  - Medical examination of A-bomb survivors and its benefit
  - Health control of A-bomb survivors
  - Health of aged persons
- (4) Application of Radiation:
  - Clinical application of radiation and radioisotopes
  - Radiation diagnosis and radiation therapy
  - Radiation for leukemia treatment
  - Application of radiation and radioisotope in life science
- (5) Effects of Accident of Chernobyl Atomic Power Station:
  - Situation of accident of Chernobyl atomic power station
  - Health problems of Chernobyl accident

### 4. Discussion

To make clear the problems and solution of the extension lectures, questions are proposed and answers to them are presented in the followings.

- (1) What idea do the citizens have on radiation?
  - a: They have feeling of fears of radiation without reliable reasons.
  - b: They think that even a very small dose of radiation induces injury.
- (2) What don't they know?
  - a: They don't know that people living on the earth are exposed by natural radiation.
  - b: They don't know that they contain radioactive  $^{40}\text{K}$  in their body.
  - c: They don't know that low level radiation induces no injury.
  - d: They don't know well that radiation and radioisotopes are applied in medical treatments.
- (3) What should we consider for the extension lectures?
  - a: We should try to make the citizens understand scientifically and medically what they don't know.
  - b: We should try to use words which they use in their daily life, not technical terms.