

## Summary of the meeting with Professor Stewart Freeman

### 1. Personal profile

#### (1) Name

Dr. Stewart P.H.T. Freeman

#### (2) Affiliation

Professorial Research Fellow, University of Glasgow &  
Head of Facility, Accelerator Mass Spectrometry (AMS) Laboratory, Scottish  
Universities Environmental Research Centre

#### (3) Major professional experiences (only selected ones)

Ph.D. in Physics (University of Oxford, 1992)  
Research Assistant, Radiocarbon Accelerator Unit, University of Oxford  
Scientist, The Center for AMS, Lawrence Livermore National Laboratory  
Consulting Assistant Professor, Stanford University School of Medicine  
A number of international consultations

#### (4) Areas of expertise

Cosmogenic and anthropogenic long-lived radionuclide measurement and use;  
Promotion of research applications of isotopes for biomedical and earth sciences

### 2. Meeting Specifications

#### (1) Date

September 12, 2012

#### (2) Venue

Special Conference Room, NIES

#### (3) Participants

Professor Stewart Freeman  
Dr. Shinichiro Ohgaki, President  
Mr. Yoshiro Kaburagi, Vice President  
Dr. Yasuyuki Shibata, Senior Principal Researcher, Center for Environmental  
Measurement and Analysis  
Dr. Atsushi Tanaka, Senior Researcher, Isotope and Inorganic Analysis Section,  
Center for Environmental Measurement and Analysis  
Dr. Shunji Hashimoto, Senior Researcher, Advanced Organic Analysis Section, Center  
for Environmental Measurement and Analysis  
Dr. Hideyuki Shimizu, Manager, International Coordination Office

#### (4) Discussion Procedure

To begin, President Ohgaki presented an overview of NIES, and indicated to the advisor the following three general topics as guiding points for discussion:

- (A) Distinctive features of NIES in the areas of advisor's specialization
- (B) Distinguishing features of NIES as a research institution involved with the environment, and points of expectation
- (C) Points which NIES should address and strengthen.

Professor Freeman was then shown around the two facilities with the highest correspondence to his fields of specialty (Center for Environmental Measurement and Analysis; Center for Environmental Health Sciences), by affiliated researchers, while conducting a frank exchange of opinions with these researchers. Subsequently, Professor Freeman offered his comments (see below) to President Ohgaki, based on the information provided, followed by wide-ranging discussions between the attendees.

#### 3. Comments by Professor Freeman

(1) NIES has tremendous opportunities owing to its high capacities which should provide significant scientific contributions to the international community

What I observed here today at NIES convinced me that NIES has excellent capacities for conducting environmental research. Projects are well-focused and managed. Researchers all appear enthusiastic and have interesting ideas, and with high levels of skill and expertise. I believe the existing capacities of NIES will allow it to continue doing important work in the years to come. Through such work we can expect significant scientific contributions from NIES to the international community.

(2) Having many environmental research fields as integrated initiatives in one place is a distinguishing feature of NIES

I felt that NIES is engaged in comprehensive environmental research. I believe collecting all these fields together in one place is beneficial to everybody concerned. In other countries, it is often the case that expertise in respective fields is spread across different institutions. Therefore I believe the concentration of many fields of expertise to be one of the distinguishing features of NIES.

(3) The expertise of NIES researchers on topics such as accelerator mass spectrometry (AMS) is at the highest level on a world scale

I was impressed by the NIES researchers, whose expertise in the operation of AMS

is high as far as international standards are concerned. As demands for experts who are experienced in the operation of AMS grow, I am of the view that these persons will prove of tremendous value. For example, my laboratory is currently looking for talented experts who can work with us, as we are getting too busy especially in fielding requests from business partners. In this regard, NIES has the potential to provide useful resources and expertise.

(4) The operation of equipment in an appropriate environment is a strength of NIES

I would like to express my support for the way in which NIES uses equipments for solo purposes. At present, especially at universities, equipments are often mixed-used, e.g., physicists and biologists compete for the use of the same machine. This could prove a disturbance to the clarity of the mission of analysis, and in my view, has the potential to have unfavorable impacts for the performance of research. I believe that having equipments in an appropriate environment and being able to produce good research outcomes is one of the strengths of NIES.

(5) The exceptional personnel available at NIES would likely be highly rated even in the commercial sector

I believe that the excellent human resources available at NIES are also of potential use in the commercial world. My institution made the transition to being a commercial institution a few years ago. Although this was an unexpected development even for us, we have been very successful since then. What our experiences can teach us is that what we may think of as being run-of-the-mill in terms of techniques and expertise can be of considerable value to outside interests. Even with operational costs and overheads included, our prices are still cheaper than those of commercial institutions. Hence, I would imagine that, if NIES wishes, it can also expect responses similar to those which we experienced and could survive commercially. It is also an advantage of NIES that the applications of the various researches are internationally relevant, and thus there exists the potential that more such requests from commercial concerns could arise.

(6) A consolidated approach between research fields is the key to extending the scope of environmental research at NIES

As NIES is large, i.e. almost five times the size of my institution, and every researcher is highly specialized on particular topics, I am curious to learn more about how they conduct interdisciplinary work. For example, I observed various research

activities relating to environmental measurement, then wondered how these are connected with research on environmental impacts. This approach can be applied to research on areas such as global carbon dioxide and risk associated with natural disasters, nuclear power etc. There remains considerable scope for potential new initiatives in the field of environmental research. The CO<sub>2</sub> analysis programme is a good example of this. The combined expertise of the two centers visited today likely will be required to achieve the challenging goal of very high quality radiocarbon measurements. Such an established capability would be a significant development in the international analysis community as well as addressing important science.

(7) The provision of training opportunities for young researchers is imperative, and NIES has great capacities in this respect

At my institution, we have fielded requests from all around the world to provide training to young researchers. Nowadays, I feel that young researchers tend to see analytical equipment simply as a box, and their knowledge and skills are not necessarily sufficient for their effective application. In order to train young researchers not only in the skills necessary for measurement but also providing them with other technical skills required to operate AMS, we invite them to join research projects at our institute. The number of such training opportunities needs to be increased. In my view, if NIES wishes, it can deliver such training, given its high capacities.

(8) NIES by acting as a hub of research for archiving measurements of radioactive substances arising from the accident at the nuclear power plant in Fukushima could make important contributions to the field of environmental research

It is clear to me that NIES expertise in conducting research towards the creation of systematic archives of measurements of radioactive substances is considerable. Combined with the expertise of local researchers, this could become a significant contribution to the field of environmental research. For example, NIES already has various reference measurement materials. Thus it may be possible for NIES to apply this to measurements of radioactive substances. Measurements in evacuation zones also strike me as being of great importance. For instance, NIES could extend its existing dust research in order to measure dust in the filters of the air conditioning units of cars, which have been abandoned since the accident.



Professor Stewart Freeman

フリーマン教授



Introduction of NIES by  
President Ohgaki

理事長による国環研の紹介



Explanation of research using the NIES  
Lidar System (Center for Environmental  
Measurement and Analysis)

国環研のライダーシステムの研究説明  
(環境計測研究センター)



Group photograph at Japanese  
garden following the meeting

会議終了後に日本庭園にて撮影