

# Science Bulletin

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## Summary of the 2000 AIT-TECRO Scientific and Technological Annual Meeting



**Fig. 1** A group photo of participants at the 2000 AIT-TECRO Scientific and Technological Annual Meeting. From right to left in the front row are Dr. Pierre Perrolle, Director of Division of International Programs, NSF, Dr. Wu Mao-kun NSC Vice Chairman, Dr. Wanda E. Ward, NSF Deputy Director, and Ms. Barbara Schrage, deputy managing director of the American Institute in Taiwan.

The AIT-TECRO Scientific and Technological Annual Meeting is held alternately in Taiwan and the United States. This year's NSC participants, led by Director Hsu Tze-chih of the NSC International Programs Dept., attended the meetings held at the US National Institute of Standards and Technology (NIST), National Institutes of Health (NIH), and National Science Foundation (NSF). NSC Vice Chairman Wu Mao-kun also came to the US specifically to attend the NSF-NSC meeting. The results are described in the following three parts:

### **I. Annual cooperation conference with NIST**

The primary mission of NIST is to promote economic growth by working with industry to develop and apply technology, measurement and standard. One-fourth of NIST's roughly 3,300 employees possess Ph.D. degrees. Each

year there are also approximately 1,500 visiting researchers. The NSC Precision Instrument Development Center hoped NIST's pressure and vacuum group and optical technology division could send personnel to Taiwan to serve as consultants and cooperate in the establishment of micro flow calibration system and CCD radiometry calibration system. This request met with preliminary consent.

### **II. Annual cooperation conference with NIH**

At the conference held at NIH on June 19, the NSC proposed the two new topics of (1) aging and central nervous system disorders (including Parkinson's disease, Alzheimer's disease, dementia, stroke, and mental disorders) and (2) functional genomics and bioinformatics. The US National Institute of Mental Health indicated a strong interest in performing joint research with scientists in Taiwan. NIH is currently mak-

ing a major effort to promote research on functional genomics and bioinformatics, and has established links with the National Library of Medicine, National Center for Biotechnology Information, National Institute of Human Genome Research, and National Cancer Institute.

The following joint research projects are receiving funding from the NSC and NIH:

#### **1. Neurodegenerative Disorders in Basal Ganglia and Cerebral Cortex:**

This project, which is in its second year, involves the ROC National Defense Medical Center and the US National Institute of Drug Abuse. The researchers from Taiwan provided experimental models for stroke and Parkinson's disease transplants, while the Americans provided gene knockout animals, neurotrophic factors, and experimental techniques. The project has resulted in several papers published in prominent academic journals.

## 2. Genetic, Environmental, and Immunological Factors in the Development of Asthma in Early Childhood:

This project is being conducted by researchers from the University of Minnesota and Veterans General Hospital in Taiwan. Both parties having received approval, a bilateral seminar is to be held in Taiwan in the end of this year.

## 3. Ethnic and Genetic Differences in Alcohol Metabolism, Effects of Ethanol and Alcoholism:

This project, conducted by the ROC National Defense Medical Center and the US University of Indiana, is studying the relationship between genes linked to alcoholism and other genes and the environment. One particular focus is on the relationship between alcohol metabolism gene polymorphism and alcohol metabolism and organ damage.

Projects proposed by the Americans included:

- (1) International Collaborative Study of Oral Health.
- (2) Collaborative Research Program in Nasopharyngeal and Oral Cancer.
- (3) Collaborative Research Program in the Development of Childhood Asthma.
- (4) Neuro-mechanism of Methamphetamine Addiction and Its Prevention.

Among these topics, "International Collaborative Study of Oral Health." was first proposed at the "International Oral Health Care Systems Conference" held in Kaohsiung during June 19~20 of last year (1999). Kaohsiung Medical College's contribution to this project is a study of oral health on offshore islands and in remote areas of Taiwan. A survey of 5~18 year olds has been completed, and funding is being sought for a survey of middle-aged and elderly persons.

Dr. Karl Western of the National Center for Immunology and Infectious Disease expressed interest in finding a partner for a joint project on allergic diseases, infectious diseases, and drug-resistance in microorganisms.

In the future the NSC will encourage domestic researchers studying relevant fields to take the initiative in making contact with perspective research partners and sharing experience. It is hoped effort will be focused on fields that will raise domestic research standards or that are closely connected with other work being done by the NIH or in Taiwan.

## III. Annual NSC-NSF cooperation conference

This conference was held on June 20 at NSF. Presentations were given on the four topics of information technology, training manpower resources in East Asia, earthquakes, and environmental science.

### 1. Information technology:

#### (1) Digital Museum

A report on the digital museum was made by Dr. Ching-chih Chen, member of President's Information Technology Advisory Committee and professor of Graduate School of Library and Information Science, Simmons College. Taiwan, China, and the United States will cooperate in creating a digital museum focusing on Chinese culture. Organizations participating in this project will include Taiwan's Academia Sinica, National Taiwan University (NTU), and National Tsinghua University; China's Beijing University, Shanghai Transportation University, and Tsinghua University; and the United States' Cornell University, University of California at Berkeley, and the University of Pittsburgh. The goal of this project will be to jointly develop a network that will allow people around the world to obtain information concerning Chinese culture.

#### (2) Giga-scale Chip System

A report on this project was presented by Prof. Jason Cong of the VLSI CAD Laboratory, UCLA. Although there is a steadily growing demand for systems chips, their design, integration, verification, and testing currently faces many bottlenecks. Many Taiwanese and American scientists have therefore discussed joint research in these areas, and plan to take a prototype next-generation network processor as the goal of their design efforts. American research

team organized by Prof. Jason Cong of the UCLA and Prof. Tim Cheng of the University of California at Santa Barbara is planning a joint Sino-American project with the "IC Design Technology Research Center" at National Tsinghua University in Taipei.

## 2. Training of manpower resources in East Asia:

### (1) AWARE (American Workforce and Research and Education: East Asia)

A report on this project was presented by Dr. Alex DeAngelis, program coordinator of the NSF Division of International Programs (DIP). In light of East Asia's highly-qualified manpower resources, economic strengths, and steadily-increasing investment on science and education, as well as the fact that far fewer American students study in Asia than in Europe, this three-year project will improve manpower training interchange with East Asia and boost the international competitiveness of the United States' sci-tech manpower.

### (2) Summer Institute in Taiwan

A report was presented by Dr. Larry Weber, senior program manager, DIP, NSF, concerning the results of summer workshops held in Japan and Korea during recent years. Apart from giving the participants experience at academic research, the workshops have also promoted cultural interchange. The program will take another big step forward this year by holding a workshop in Taiwan for the first time.

## 3. Earthquake research:

### (1) Taiwan Earthquake Research Project

A presentation on earthquake research was given by Prof. Chang Kuochen of the National Center for Research on Earthquake Engineering and the NTU civil engineering department. The content of the presentation included earth movement and structural damage data collected in the wake of the serious earthquake on Sep. 21st last year, the earthquake research project to be carried out over the next three years, and the establishment of a joint international research steering committee.

## (2) Major Urban Area Earthquake Research Project

A presentation was given on this project by Dr. Priscilla Nelson, director of the NSF Division of Civil and Mechanical System. The new project for 2000 will include joint research on Taiwan and Turkey's earthquake. Ten of the 23 project items that have passed review will be carried out jointly with partners in Taiwan. Each project will last one year and will receive funding of US\$75,000.

**4. Environmental science research:**

## (1) Long-term International Ecological Research Network and Long-term East Asian Ecological Research

A presentation was given by researcher Hen-biao King, Taiwan Forestry Research Institute. Cooperative activities during the past year included Taiwan

and U.S. scientists' visits to the sites of the Long-term exchanging Ecological Research Project and the third East-Asia and Pacific International Long-term Ecological Research (ILTER) Regional Conference in Seoul. In addition, Korea has established three experiment sites, the Philippines has established one experiment site, and Thailand is currently preparing a site. Apart from the five existing experiment sites in Taiwan, the Taiwan Long-term Ecological Research Committee plans to establish urban, coastal, marine, and agricultural experiment sites. The Taiwan National Park Administration has agreed to set up six experiment sites, and a coral reef experiment site is now being established.

## (2) Prospects of environmental science and engineering in the 21st century

A presentation was given by Execu-

tive Secretary Dr. Penny Firth, Task Force on the Environment of the National Science Board. People's quality of life will improve in the 21st century with personal growth, the creation of new wealth, and the emergence of opportunities to maintain and improve the Earth's health. The NSF has completed the *Prospects of Environmental Science and Engineering in the 21st Century Plan*, which calls for the implementation of new research and educational activities, and the integration of many fields of science and engineering for the sake of environmental research.

The discussion at this annual conference included both new topics and ongoing currently joint topics. Both sides expressed their willingness to continue to actively promote mutual cooperation and hoped to achieve many positive results.

## Color 3D Animated Video of the "Book of Ritual-Shih Hun Rituals Chapter"

Text has always been the method of choice for communicating the results of research in the humanities. But because text has trouble conveying tangible things and actions, visual methods are preferable in some cases. Although photographs have been used since the invention of the camera, photographs, like drawings, cannot express continuous action. And while motion pictures solve the problem of expressing continuous action, they are time-consuming and costly to make, putting them beyond the budget of most humanities research. Nevertheless, the recent emergence of 3D animated video as a convenient, effective, inexpensive tool has presented an opportunity to overcome the above problems. This film is a groundbreaking innovation in terms of its material and length, and offers a model for the academic use of animated video.

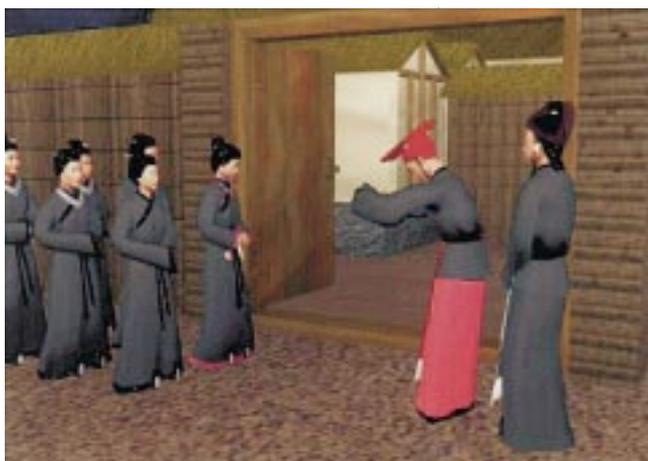
The study of ancient rituals has both practical and academic importance. From a purely academic standpoint, rituals are significant as a link in the fabric of ancient culture, and familiarity with

ancient rituals can shed much light on ancient writings. As for practical aspects, modern rituals have evolved from their ancient counterparts, and study of ancient rituals, by strengthening continuity between today and antiquity, can pass on the virtues of propriety and justice. Much of the protocol and ceremony of modern times has largely inherited the significance and procedures of ancient rituals. If we do not study the rituals of antiquity, we will not understand the origin, significance, and usefulness of contemporary rites and customs.

The 17-chapter Book of Rituals is one of the thirteen classics. Its content records the rituals of the various levels of nobility during the Zhou dynasty, and it encompasses political, social, and life cycle customs and ceremonies. The "Shi Hun Rituals" chapter is one of the 17 chapters of this book. It records the marriage protocol of the *shi* (the lowest level of nobility during the Zhou dynasty). It provides a detailed description of the participating individuals, actions, costumes, places, and times (the name

of this chapter is a reference to the fact that the bride was escorted home after dusk) of matchmaking, bringing back the bride, the entrance of the bride, and her paying respects to her new father and mother-in-law. Apart from the time of bringing home the bride, there is actually little difference between the format and significance of modern marriage rituals and those of the ancient rituals described in this chapter. While most people may think that things change with the passage of time, and that ancient rituals are extremely remote from everyday life, this line of thinking does not conform to reality.

In 1965 Dr. Li Chi, chairman of the East Asia Academic Planning Committee, proposed using historical reconstruction to study the Book of Rituals. The "Book of Rituals Reconstruction Task Force" was thus established as one of the Committee's research projects. The task force was chaired by Prof. Tai Ching-nung, while Prof. Kung Teh-cheng led collective research by the students of the National Taiwan University's graduate schools of Chinese literature



**Fig. 1 (Example of animation)** The groom is standing outside the gate and bowing to the bride as he prepares to lead the bride and the girls accompanying her through the gate together.



**Fig. 2 (Example of animation)** On the evening of the wedding, the bride's carriage follows behind the groom's carriage as they arrive at the gate of the groom's family home.

and archeology/anthropology. The six topics studied were ritual details, costume, utensils, houses, vehicles, and folk customs. The research method consisted of careful study of concepts and ideas from classical texts, archeology, ancient utensils, and ethnology, while taking into consideration the conclusions of scholars throughout history. The research reports on each specific topic were authored by Shen Chi-li, Wu Hung-yi, Wu Ta-yun, Shih Lung-min, Chang Ching-ming, Chang Kuang-yu, Chen Jui-keng, Chen Ching-yuan, Tzeng Yung-yi, Huang Chi-fang, Huang Jan-wei, Liu Wen-hsien, and Cheng Liang-shu. These reports contained a total of 500,000 characters and were issued in stages in the annual bulletin of the East Asia Academic Planning Committee. They were afterwards published by the Taiwan Chinese Book Store as the "Book of Rituals Reconstruction Collection."

Based on the results of the above research, in 1969 Kung Teh-cheng supervised the creation of the black and white film "Book of Changes—Shih Hun Rituals Chapter." This film conveyed

ceremonial procedures in a continuous, tangible form, remedying conventional pictures' problem of discontinuity. This film launched a new era in the study of ancient rituals and was widely acclaimed by the academic community. Nevertheless, because this film was made more than thirty years ago, it is now in a state of advanced deterioration. Since it can now be shown only with great difficulty, its use in disseminating research results is extremely limited.

In this age of advanced computer technology, the use of a 3D animated video could both revitalize past research findings, and also offer the following advantages:

1. Replacing black and white with color would convey past research findings in a more vivid manner (especially costumes and utensils).
2. Because the action could be stopped, enlarged, or printed at any time, the format would exceptionally well suited to teaching.
3. The issue of a reasonable-priced, high-quality CD would facilitate widespread distribution.

4. The publication of some portions on the Internet would allow viewing by the general public, enhancing the public's knowledge of ancient rituals and culture.

5. Images of persons, vehicles, and utensils could be reproduced and used for various purposes, such as the filming of more 3D animated videos concerning ancient rituals and history. The more videos are produced, the more inexpensive they will be.

In light of these advantages, the project director has obtained Prof. Kung Teh-cheng's consent to use the original film as a blueprint for this video, while making a few additions and corrections, and incorporating the findings of textual research concerning colors. It is hoped that this project will open the way for new methods of studying and presenting ancient literature.

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