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SCIENCE BULLETIN

National Science Council
2 Canton Street
Taipei, Taiwan, Republic of China

ROC-U.S. Strengthen Cooperation In the Study of Earthquakes

More than 30 seismologists from the United States and the Republic of China held discussions on September 7-10 on further earthquake research in the Taiwan area.

The meeting, which took place at the National Taiwan University, underscores cooperation between the two countries under an ambitious project to jointly study earthquakes in the circum-Pacific belt which follows the edges of the Pacific Ocean from Okinawa to the Philippines.

Prof. Bruce A. Bolt headed the U.S. delegation in the meeting, sponsored by the National Science Council and the U.S. National Academy of Sciences.

The United States provided 37 advanced digital seismograph equipment sets which has been installed at spots in eastern Taiwan, including Ilan and Lotung, since September last year.

Prof. M. C. Chang, chairman of NSC, addressed the academic meeting, known as Special Seminar on Strong-motion Seismic Instrument Array. He reviewed the progress of the ROC-U.S. cooperation in the study of seismology and earthquake engineering. Said he:

"I am happy to say that this seminar is the newest highlight of long-lasting cooperative efforts in the fields of seismology and earthquake engineering between our two countries. As many of you may recall, an Advisory Meeting on Earthquake Engineering and Landslides was held in Taipei during August 29 - September 2, 1977 under the US-ROC Cooperative Science Program sponsored by National Science Foundation and National Science Council. Among many outstanding recommendations by that meeting one had direct bearing on the subject matter of this seminar. The advisory meeting recommended then establishment of a special purpose seismic strong ground motion

array in Taiwan. Now we have a far superior array than what was envisioned in 1977. The farsights articulated by many of you in the 1978 international workshop in Hawaii have figured prominently in the planning and implementation of our co-operative array project. This is undoubtedly one of the finest examples of international exchange and co-operation in science and technology. We at the National Science Council are delighted to have played our part.

I am told that many important questions remain concerning strong seismic ground motion and its dependence on the way the energy is released at the source, the way the motion is affected by distance, the geologic features of the source and local soil conditions and topography. Equipped with the unique data collected by the Taiwan Strong-motion Accelerograph Array you have now an excellent opportunity to bring more definitive answers to these

questions. I sincerely hope that collective deliberations at this seminar will expedite the answers on which our ever increasing number of large-scale buildings and engineering structures have great stakes.

I also notice on the program that a number of similar arrays are being planned for other parts of the world. I hope that successful experience gained from the US-ROC cooperative array will be helpful to future arrays. Our scientists and engineers are eager to take part in international scientific exchanges and cooperations on fair and dignified basis. Support and help by our distinguished American scientist friends on this matter will be warmly appreciated."

Four technical sessions were held during the seminar. The program contained the following highlights:

Technical Session 1: Introduction to SMART 1.

Chairman: S.T. Mau

B.A. Bolt: Seismological Research



Field trip to the SMART-1 station 07 at Lotung, Ilan in northeast Taiwan.

Program with SMART 1.

J. Penzien: Engineering Research Program with SMART 1.

✓Y.B. Tsai: Siting of SMART 1.

✓C.C. Liu: Installation and Operation of SMART 1.

Field Trip to SMART 1.

Technical Session 2: Research Results of SMART 1.

Chairmen: W.D. Iwan, Y.S. Pan

M.K. Hsu: Processing of SMART 1 Data.

✓Y.B. Tsai: Seismological Research Results.

B.A. Bolt: Seismological Research

Results.

✓Y.T. Yeh: Seismological Research Results.

J. Penzien: Engineering Research Results.

C.H. Loh: Engineering Research Results.

Technical Session 3: International Strong-motion Seismograph Array Programs.

Chairmen: D.E. Hudson, Y.B. Tsai

W.D. Iwan: International Aspects of Strong-motion Seismograph Array Programs.

D.E. Hudson: Indian Array Pro-

gram.

T.M. Wooton: California Array Program.

T.L. Teng: Mainland Chinese Array Program.

F.T. Wu: Mainland Chinese Array Program.

Technical Session 4: General Discussion on Instrumentation, Data Processing and Research Possibilities.

Chairmen: B.A. Bolt, J. Penzien
Instrumentation and Data Processing.

Seismological and Engineering Research Possibilities.

Taipei Hosts ROC-FRG Seminar On Plant Nutrition & Soil Science

A bi-national Seminar on Plant Nutrition and Soil Science was held in Taipei on September 24-26 under the sponsorship of the National Science Council of the Republic of China and the Deutsche Forschungsgemeinschaft of the Federal Republic of Germany. It was the first such academic meeting between scientists of the two countries.

Ten prominent German scholars and 20 scientists in the host country took part in the seminar. The seminar was divided into three sessions: (A) Nutrient of Plants, (B) Growth Regulators and Plant Yield Production, Tissue Culture and (C) Soil Sciences. Besides discussions, the participants visited a number of research establishments in and out of Taipei.

Prof. Chu-I Chang, vice chairman of NSC, paid tribute to German scientists for their contributions in the field of agricultural science in his remarks at the opening session. Commenting on the importance of the seminar, he said:

"In the last 30 years we witness the fastest industrialization taking place in the Republic of China, through introduction of advanced technologies from well-developed countries, especially Japan and the United States, and now we are coming to rank among the developed countries in the world. In the field of agriculture, we also find that great advances have been made: wide varieties of crops which we have never seen before are now common in domestic markets as well as in export; breeders constantly add new varieties with better characteristics; high yields can be secured through the use of advanced technology in plant protection, crop management and soil fertility management. But while advanced technologies are instrumental in promoting the agricultural produc-

tion, they bring new problems. The land resources are limited, they are being taken away from the agricultural use to industries and municipal installations under the pressure of industrialization and population expansion. Environmental pollutions threaten the agricultural production and the health of the nation. These problems are common to the highly industrialized countries, but the solutions may differ depending on the natural and cultural backgrounds of each country. The National Science Council has been not only sponsoring the research activities of our own to cope with these problems, but also has been encouraging international cooperation in each field of importance. The Council has been promoting cooperation with the United States and Japan for some years, and now we are glad that we can count the prominent German scholars for partnership in our future endeavor."

In the three sessions, the participants discussed the following subjects:
Session A: Nutrient of Plants

1. Ch. Hecht-Buchholz: Mineral deficiency and plant ultrastructure.

2. Y. J. Shieh: Community photosynthesis and grain production in rice plants.

3. H. C. Lin: Alteration of composition and content of pigments of rice plants during the growth as affected by various constellations of growth factors.

4. A. Jungk: Mineral nutrient concentration in the soil near plant roots and nutrient uptake characteristics of plant root systems.

5. K. L. Lai: The effect of root activity on leaf performance and mineral accumulation of rice plants (*Oryza sativa* L.).

6. L. P. Lin: Nutrient require-

ments on the growth of cultivated edible microalgae for mass production.

7. W. Bussler: Plant diagnosis as a basis to evaluate the nutritional status of plants.

8. T. T. Yang: Plant diagnosis as a basis to evaluate the nutritional status of sugar cane.

9. K. H. Hounig: Exchangeable ammonium in relation to the growth of rice plants.

10. E. Przemeck: The influence of nitroficides on nitrogen incorporation into developing seeds of wheat comparing nitrate and ammonia fertilizers.

11. C. F. Lin: An evaluation of soil N for predicting N-demand of rice crop.

12. T. C. Juang: Increasing nitrogen efficiency through deep placement of urea super granule and other modified urea fertilizers under paddy conditions in Taiwan.

Session B: Growth Regulators and Plant Yield Production, Tissue Culture

1. K. H. Neumann: Phytohormones and yield production.

2. C. H. Lin: Phytohormones in relation to the gall formation of *Zizania latifolia*.

3. W. C. Chang: Some aspects of *in vitro* morphogenesis of Ginseng and two other medical plants.

4. D. Alt: Recent developments in soilless culture.

5. C. H. Chou: The advance of allelopathic research in Taiwan.

6. M. C. Liu: Achievements of sugar cane tissue culture research in Taiwan.

Session C: Soil Sciences

1. D. Sauerbeck: Decomposition and turn-over of isotopelabelled plant residues in different soils and climates.

2. R. Haider: Degradation and transformation of lignins and phenols

in soils.

3. T. S. C. Wang: Abiotic synthesis of organomineral complexes using inorganic components of soil as oxidative catalysts.

4. R. Mayer: To be announced.

5. Y. L. Chen: Degradation of pesticides in the soil environment in Taiwan.

6. T. C. Yang: Transient state of soil oxygen concentration and its effect on soil activity and plant growth.

7. S. W. Li: Sugar cane production in relation to soil microbial balance.

8. C. C. Tu: Soil microbial activity in relation to *Fusarium* wilt-suppressive soil and -conductive soil.

9. S. H. Yang: Water activity in relation to soil gas production and soil fungistasis.

10. G. Hofmann: Limitation for the application of municipal waste compost to the soil.

11. S. C. Yen: Land treatment with animal and industrial wastes.

12. C. C. Wang: Long term soil fertility experiments for sugar cane in Taiwan.

The Nuclear Power Research Institute under the Atomic Energy Council has succeeded in obtaining gold, silver, and selenium from the anode in electrolytic refining of copper after 32 months of research.

The Taiwan Metal Mining Corporation which commissioned the Nuclear Power Research Institute to conduct the research, is planning to establish a plant for the production of the selenium. The projected plant is scheduled to be completed before March 1983.

According to the research institute, obtaining selenium through the electrolytic refining of copper poses no pollution problem.

An analysis of the economic

effectiveness of obtaining gold, silver, and selenium from the process of electrolytic refining of copper shows the investment return rate is as high as 19.48 percent.

The state-run corporation has also succeeded in obtaining platinum and palladium from the waste of electrolytic refining of gold. Production of platinum sponge and palladium through this process began in March, and between March and June the corporation produced 522.6 grams of platinum sponge and 2,311.2 grams of palladium. It is estimated annual production will reach 3 kilograms of platinum and 15 kilograms of palladium. The net profit is expected to reach NT\$3.5 million.

Precious Metals Obtained From Electrolytic Refining

NSC-Supported Research Projects

C. Y. Chang

NSC70-0404-E006-03

Development of GaAs device Technology

R. C. T. Lee

NSC70-0404-E007-05

Large scale software development project on the design of a computer network system

Chyan-goei Chung

NSC70-0404-E009-01

Large scale software development project on the design of a computer network system

Chen-chong Lin

NSC70-0405-E002-01

Manufacture of high molecular weight polyester

C. S. Li

Strength analysis and failure detection of offshore platform structure

Engineering and Applied Sciences

Hsiao-chuan Wang

NSC70-0404-E007-01

The application of microcomputers in control and monitor systems for electric vehicles (II)

Y. T. Lin

NSC70-0401-E002-01

Study on ultrasonic vibration cutting

P.S.Lü

NSC70-0401-E002-02

On the physico-chemical reaction between steel and N_2 , H_2 , Ar gas at high temperatures

Yen-ping Shih & Mou-yung Yeh

NSC70-0402-E006-04

Mass transfer and kinetic study for syntheses of fine chemicals by phase transfer catalysts

Hen-wei Tsao

NSC70-0404-E002-01

Design and implementation of spread spectrum data communication system

Y. K. Su

NSC70-0404-E006-01

The fabrication and study of liquid phase epitaxial growth of $InAs_{1-x}Sb_x$ /GaSb IR detectors

T. S. Wu

NSC70-0404-E006-02

Preparation and properties of PLZT thin film and GaAs and sapphire

T. S. Wu

NSC70-0404-E006-04

Development of organometallic C.V.D. technology

Fon-shan Yeh

NSC70-0404-E007-04

The studies of amorphous silicon-

based alloy

Chi-meen Wan

NSC70-0405-E007-02

The studies of mechanical properties of austenitic Al-Mn stainless steel

Shih-san Chou

NSC70-0405-E006-08

Effect of stressing-aging treatment (SAT) on Fe-Cr-Co ductile permanent magnets

Chao-kuang Chen

NSC70-0201-E006-32

Study on heat transfer characteristic of heat exchanger with longitudinally finned tube

Yong-chang Hong

NSC70-0404-E001-02

On extending functional capabilities of a cellular-logic device for database management

Hao-yung Lo

NSC70-0404-E007-11

Development of analytical system for the measurement of energy and intensity in ion scattering spectrometer

Yih-shun Gou

NSC70-0404-E009-04

Investigation of Josephson junction circuits and applications with electrical simulation

S.F. Guo
NSC70-0404-E009-05
Deposition of Boron in silicon by using a BBr_3 source

C. Chen
NSC70-0405-E002-02
The effect of thermal history on microstructure and mechanical properties of Titanium alloys

M. P. Hung
NSC70-0405-E006-05
Effect of additions of trivalent metal ions on the crystal structure and magnetic properties of Ca ferrites

Steve K. Huang
NSC70-0402-E011-03
Synthesis of bis-(p-epoxyphenyl) sulfone as an epoxy adhesive

Jin-fu Chang
NSC70-0404-E002-04
Packet communications via a processing satellite

Ben-ruey Liao
NSC70-0402-E011-05
Synthesis and processing study of hindered phenolic metallorganic phosphites as stabilizers for polymeric compositions

Wei-yuan Hwang
NSC70-0410-E010-01
System identification of a maneuvering ship without the measurement of a yaw speed

Yung-cheng Chao
NSC70-0402-E002-07
Design, implementation and application of DUC-Adaptrol by microprocessor

H. L. Hwang
NSC70-0404-E007-08
The research and development of Cu_2S /CdS solar cells and its characterization by cathodoluminescence studies

H. L. Hwang
NSC70-0404-E007-09
Research on $CuInS_2$ and its applications in solar cells

Tsuan-hua Feng
NSC70-0406-E002-01
Physiochemical modification of biological systems for wastewater treatment

Yen-chi Lu
NSC70-0410-E002-03
An experimental study on bed resistance and sediment discharge in torrential channels

C. T. Kuo

NSC70-0410-E006-03
A study on the drought phenomenon and its qualitative production model for southern area in Taiwan

Der-ling Tseng
NSC70-0413-E007-03
Study of reactor simulation and design of a simulator

Hong-sen Yan
NSC70-0401-E006-04
The recognition and identification of planar mechanisms

Ching-cheng Chao
NSC70-0401-E007-04
Investigation of web-stiffened foam sandwich structure

Chau-jen Lee
NSC70-0402-E007-08
Blood flow and mass transfer in bio-material tubings

Jyh-sheng Ke
NSC70-0404-E001-01
Design and implementation of a distributed data-base system

Te-son Kuo
NSC70-0404-E002-03
Microprocessor-based controller for saturated minimum time control system

S. Su
NSC70-0404-E006-05
The study of growth and characterization of InGaAsP-InP lattice-matched double heterojunction lasers

Ruey-shing Huang
NSC70-0404-E007-07
Polysilicon technology and FAMOS - A nonvolatile semiconductor memory

Takshing P. Yum
NSC70-0404-E009-03
A simulation study of buffer storage allocation strategies in a communication network node

Yu-wen Yu
NSC70-0413-E007-04
A study of nuclear fission Gas hold up system

Lien-wen Chen
NSC70-0201-E006-31
Buckling of initially stressed thick composite plates

Pao-shan Weng
NSC70-0413-E007-05
Dosimetry study for medical ionizing radiation (III)

Hung-chao Lee
NSC70-0402-E005-01

Ethanol production from cellulosic materials

Ying-gev Hsu
NSC70-0402-E011-04
The reactivity of saturated copolyester of low molecular weight and curing agents

Biological, Agricultural, and Medical Sciences

Yeong-biau Yu
NSC70-0409-B002-44
Ethylene nutritional status biochemistry and physiology. I. Studies on 1-aminocyclopropane carboxylate synthase, the key enzyme in ethylene biosynthesis

Yau-i Chu
NSC70-0409-B002-45
Faunastic survey of insects in Taiwan (II)

S. C. Chiu & K. S. Lin
Faunastic survey of insects in Taiwan (II)

Pei-chung Chen
NSC70-0409-B005-30
The influence of NO_3^- , NH_4^+ on the growth and nitrogenase ability of *Anabena* sp. CH

Ching-en Chang
NSC70-0409-B020-03
A survey and study of the flora and vegetation of Lutao (I) Study on the flora of Lutao

Ta-wei Hu
NSC70-0409-B054-02
The selection of best clones of *Broussonetia papyrifera*

Tze-ting Wang
NSC70-0409-B002-48
The study of the dry matter production and nutrient accumulation of the economic bamboo stands in Taiwan (I) Moso-bamboo

Jyh-chao Hsue
NSC70-0409-B005-31
The anatomy of the noxious weeds in the cultivated land of Taiwan

Fu-yuan Lu
NSC70-0409-B021-06
Study on the fire's effects on forest soils and vegetational succession

Natural Sciences and Mathematics

Rouh-jane Chou
NSC70-0204-M007-04
On the expected length of a minimum spanning tree

中華民國七十六年七月二十七日

中華郵政特准掛號認爲新聞紙類