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NSC/NSF Seminar on Plate Tectonics and Metamorphic Geology

A seminar on earth science jointly organized by the National Science Council, R.O.C. and the National Science Foundation, U.S.A. under a contract for CCNAA, and AIT, was held in Taipei from January 5 to 13, 1981. This was the first seminar meeting taking place between the Republic of China and the United States after the conclusion of a renewed agreement for scholarly and scientific cooperation between the two countries in September, 1980. The main subject of the seminar is "Plate tectonics and metamorphic geology." Six geoscientists from U.S.A. came to the seminar headed by Prof. W. G. Ernst of UCLA as the chief American coordinator. Three eminent geoscience professors from France, two geology professors from Japan and one geology professor from Korea were invited as guest speakers to the seminar. In addition, 63 local geologists, geophysicists, and geochemists from various institutions and universities also attended this seminar. On the other hand, the technical sessions were attended by a large number of other Chinese geologists and students as observers. This is really a small international gathering of geoscientists who have been provided with good opportunities to exchange information, ideas and expertise and to attend on geological problems of common interest related to the theme of this seminar. This will also ensure a close cooperation and communication of scientific results among the geologists from different countries attending the meeting.

The seminar took place in the lecture hall of the National Taiwan Institute of Technology. The opening session began at 9:00 a.m. on January 5, 1981. The opening and welcome address was given by Dr. S. S. Shu, Chairman of the National Science Council, R.O.C. This was followed by key-note addresses presented by Prof.

Ernst of the American delegation and Prof. Jean Aubouin from the University of Paris who spoke for all the invited guests attending this seminar.

The technical sessions began in the same hall at 10:00 a.m. and were divided into three major topics from January 5 through 7, one topic for each day. These three sessions were entitled (1) plate tectonics (2) regional tectonics and geophysics and (3) metamorphic geology and petrology. Nearly 30 papers were presented in these three-day technical sessions contributed by authors from different countries. Interesting discussions and comments generally followed each paper presentation and all the participating geoscientists found the discussions most stimulating and educational. The important papers presented in the technical sessions included the study of collision, subduction, and plate tectonics; the tectonism, sedimentation, and seismicity at plate boundaries; the study of basement geology and polymetamorphism of the Central Range of Taiwan; regional tectonics and geophysical study of Taiwan; study of metamorphic facies; and petrographic study of the oceanic mafic rocks in the metamorphic complex of Taiwan. All the participants shared in the common interest in the ensuing discussions from which specific ideas and concepts were developed.

The other highlight of the seminar is the 6-day field excursion after the technical sessions as modern geological information is based mainly on observation, measurement, and analysis of the earth materials in the field. Therefore field investigation and study are challenging and vital to the career of geologists the world over. Taiwan is located on the boundary between two leading plates in the world, the Pacific plate on the east and the Eurasia plate on the west. On the other hand, it is a mountain belt under early stage of formation and a large part of the

mountain areas in Taiwan is underlain by various kinds of metamorphic rocks. There are many attractive geological features in Taiwan which are unique and especially of interest to foreign visitors.

A total of 35 geologists participated in the post-conference field excursion including 11 visitors from foreign countries. The first day trip on January 8 covered the western section of the central cross-island highway from Taipei to Lishan. The important field of study comprises the Paleogene to Miocene low-grade metamorphic rocks which constituted the main part of the Central Range. The second day trip on January 9 transversed the eastern section of the central cross-island highway between Lishan and Hualien in which the various tectonic and petrographic features of the pre-Tertiary metamorphic complex were investigated and studied. On January 10 the group went from Hualien to Yuli along the eastern longitudinal valley which is the suture boundary between the two plates mentioned above. The whole day was devoted to the study of metamorphic oceanic blocks in the metamorphic basement of the Central Range and the East Taiwan ophiolite in the Coastal Range. In addition, the site of the Yuli Primary School was visited to study the earthquake faults and fractures resulting from the East Taiwan earthquake which occurred in 1951.

On January 11 the metamorphic geology of the eastern part of the southern cross-island highway between Chihshang and Litao was studied and the field group stayed in Taitung overnight. On the last two days of the excursion, two most unique and interesting geological formations were investigated and studied, the Lichi melange near Taitung and the Kenting melange on the Hengchun peninsula. These two formations are chaotic in occurrence and formed by tectonic

emplacement related to plate-subduction setting. The peculiar and significant topographic and lithologic features of these two units are so spectacular that similar features of this

kind could rarely be found in other parts of the world. The 6-day field excursion was well-planned and very informative. All the participants have learned much about mountain building,

metamorphism, and plate tectonics as well as the important geological features of Taiwan. They do enjoy the trips as well as the scenery of this beautiful island.

Sixth Firm Setting up Plant At Science-based Industrial Park

A ground-breaking ceremony was held at the Hsinchu Science-based Industrial Park on March 10 for the sixth high-technology firm to operate in the special industrial zone.

The new company is Advanced Device Technology Inc. After its factory building is completed, it will join five other firms already operating in the park.

The five companies are Wang Computer Taiwan Ltd., Microtech International Inc., Kuang Yi Company Ltd., Sigma Delta Ltd., and Tecom Company Ltd.

Advanced Device Technology Inc. is a joint venture of the Bank of Communications, China Development

Corp. and Dr. Wei-kuo Wu. It will be the fifth company in the park to manufacture sophisticated electronic products.

Nine other investment projects have been approved for the park, which is the Chinese version of the Silicon Valley in the United States.

According to the Park Administration, two more investment projects are expected to be approved soon. Over 100 foreign firms have approached the park authorities to make inquiries about investment possibilities, of which 30 or so have shown a keen interest in starting operation in the park.

Dedicated last December, the

science park has completed its first-stage development covering an area of 210 hectares. Park authorities hope to have 30 to 50 factories operating in the park in the next few years.

Development of the whole 2000-hectare park area is to be completed in three stages over a period of 10 years.

Making further efforts to attract more foreign investors here, the NSC has employed an American consultant company for publicity abroad. On the other hand, it is suggested to amend the organization's regulations permitting the products to be marketed at home after paying taxes, and reducing income tax for profit-earning ventures.

Recapitulation of Mycotoxin Research in ROC And ROC-Japan Seminar on Mycotoxins

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It has been well known that fungi are capable of producing metabolite (mycotoxins) which cause health hazard both in human and domestic animals.

However until the discovery of aflatoxin (AF) in 1960 and subsequent demonstration of its potent carcinogenic properties, only a limit interest was shown in mycotoxin in our country.

The possibility that contamination of dietary staples by AF could be an aetiological factor in liver cancer was originally suggested by la Breton *et al.* (1962) soon after the outbreak of Turkey X disease in Britain.

The first epidemiological study carried out by Oettle in Africa in 1964 supported this suggestion. As early as in 1965 Tung had also suggested that the high incidence of liver cancer in Taiwan may be linked with dietary AF. However none of the information of the contamination of AF in our daily food was available at that time.

Tung and his colleague undertook the first survey of AF producing fungi

contaminated in food (1967). Coincidentally in March 1967, an episode of acute intoxication probably due to ingestion of moldy rice occurred in three families of Shung-Chi township of Taipei county. The isolation of the toxic strain of *Aspergillus flavus* and demonstration of the presence of AF B₁ from the moldy rice were reported by them. The survey of AF in peanut and peanut-product and fungi contaminated in unhulled rice were carried out by them with a financial support by JCRR. During the survey of fungi in 1968, Ling and his associates discovered new toxins from the chloroform extract of rice culture of *Aspergillus terreus* No. 23-1. The toxins exhibited similarity in both Rf values and blue fluorescence as AF B₁ does on some TLC viewing under longwave ultraviolet light. However these AF B₁ like compounds were found to be structurally unrelated to AF. These finding let them later to succeed isolation and characterization of at least four structure related new tremorgenic mycotoxins named as

Territrem a, b, c, x.

Liu and Wang in 1966-1968 demonstrated that some fermented food including wine were free from AF contamination.

Wei and his colleague studied some basic problems such as; effect of AF B₁ on biosynthesis of lipid in the rat (1967), stability of AF B₁ in aqueous solution (1969), uptake of AF B₁ by the skin of rats (1970) and binding of AF B₁ and G₁ to human serum protein (1971). He also discovered PR toxin, a toxic metabolite of *Penicillium roquoferti* when he was studying in USA in 1972.

The survey of AF in the imported corn from Thailand and feed carried out by Tseng *et al.* during 1975-1976 most clearly indicated that AF constitutes a threat to both economic and public health concern in this country. Therefore the protection of food or feed from mycotoxins such as AF must be seriously considered. In 1977 Dec. our National Health Administration announced that the maximal dosage allowance of AF B₁ for

food and foodstuff as 50 ppb.

The development of sensitive, accurate and rapid analysis for AF in various commodities therefore become important. Lu and Ling (1974) reported the modified method of Velasco to determine AF B₁ in agricultural products. Recent advance of high pressure liquid chromatography (HPLC) has suggested that it could be a rapid and reliable analytical tool for routine AF analysis. Wei and his associates have developed a new procedure for quantitative analysis of AF in a different commodities using HPLC. They have surveyed several food such as peanut, peanut product, soysauce, fermented food, Chinese ham and wine etc. Tang and Ling also determined AF level in rice by HPLC. The survey of mycotoxins other than AF such as sterigmatocystin, ochratoxin, zeralenone, trichothecene toxins, patulin and kojic acid were carried out by several laboratories. Attention was also focused on toxigenicity, metabolic

fate and biosynthesis of mycotoxins. Lin reported the biotransformation of AF in rodent in 1978.

During the past 15 years, several review articles referring AF or mycotoxins appeared in the local journals. The National Science Council has supported many research groups in mycotoxin research. Drs D.P.H. Hsieh from Univ. of California and C.H. Mirocha from Univ. of Minnesota who were invited by the National Science Council had played an important role in promoting mycotoxin research in this country. The name of the late Dr. Shih-Chu Hsu, the former head of the division of life sciences of National Science Council must be mentioned for his leadership in studying food safety. Mycotoxins has been the major topics of the seminars or conference on food safety in the past.

Taiwan Grain and Feeds Development Foundation has jointed its effort in protection of food and feed from mycotoxins. They supported several

projects such as publication of the magazine "Mycotoxin digest" edited by K.P. Hsiung, detoxication and control of AF, and study on AF retention in the tissue of domestic animal after AF feeding etc. The National Science Council of ROC and Interchange Association of Japan will together sponsor a seminar on mycotoxins.

Since Japan has along brilliant history in studying mycotoxins, the forthcoming binational seminar on mycotoxins by ROC and Japan will inspire our scientists and be a good starting of future cooperation in their common interest. Four well known scholars will be invited from Japan as guest speakers in the meeting. Seventeen papers including four papers by guest speakers are divided into three session: such as mycotoxins contaminated in food and feed (March 23) toxicity and metabolism, some new mycotoxins (March 24).

Geothermal Power Plant Undergoes Test Run

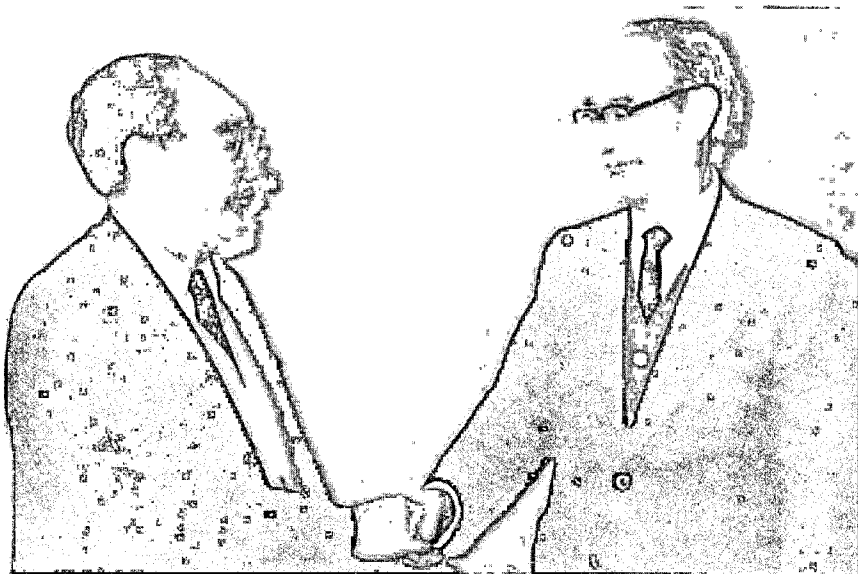
The first pilot geothermal power plant designed by local experts has undergone a successful test, paving the way for construction of bigger plants of the same kind in Taiwan in the future.

The plant was completely installed in mid-February and the test run started on Feb. 28. The test proceeded smoothly. With this successful test, the Republic of China became the 11th country in the world to use geothermal heat to run a power plant.

Located at Yilan, the plant has five

geothermal wells. Up to now, only part of the wells have been used for the test run. Once all the preparations are ready, then the plant will start its commercial operation and after that, it will join other power plants of Taiwan Power Co. to generate some electricity.

The successful test of the geothermal plant enabled Taiwan to diversify its energy use in electricity generation. Tai-power can use this pilot plant to train its personnel how to operate the geothermal plant in the future.



Prof. Chang Ming-che (left) took over his new duties as Chairman of the National Science Council on March 1. He is pictured here receiving congratulations from Dr. S. S. Shu, his predecessor.

NSC-Supported Research Projects

Biological, Agricultural, and Medical Sciences

Tsai-hsien Chiu

NSC70-0412-B010-09

Combined effects of cooling and cardioplegic agents on conduction velocity, passive electrical properties and intracellular ionic activities of cardiac Purkinje fibers.

Ing-jun Chen

NSC70-0412-B037-01

Effects of morphine antagonist, DA ergicanonist and antagonist on Ephedrine-induced locomotor activities and stereotyped behaviors in rats.

Chang-sheng Kuoh

NSC70-0412-B041-01

Anatomical and phytochemical studies of Formosan Rutaceae

Tung-bin Lo

NSC70-0203-B001-02

Studies on the amino acid sequence of two neurotoxins from *Bungarus fasciatus* venom Part II.

Yee-hsiung Chen

NSC70-0204-B002-04

Structure and function of cobra cardio-toxin, α - and β -bungarotoxin and their activities on cell membrane.

Thomas M. Liu

NSC70-0409-B002-08

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