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## PEOPLE'S REPUBLIC OF CHINA SCIENTIFIC ABSTRACTS

No. 195

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AERONAUTICAL KNOWLEDGE

AUTHOR: LING Fu-ken [0407 4395 2704]

ORG: None

TITLE: "The Space Shuttle"

SOURCE: Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 11, Nov 77 pp 7-10

ABSTRACT: The space shuttle is a reusable space vehicle which is borne aloft, along with an external storage tank, by two solid-fuel rockets. It can land like an airplane under its own power. Its advantages are: 1. Cheaper space exploration; 2. Greater safety in astronautics, especially in reentry; 3. Producing with current technology; 4. Provides an increased range of astronautical activities including placement and recovery of satellites, astronomical observation, staging for deep-space missions, supply of new types of orbital stations including solar power stations, hospitals and factories. The space shuttle suggests the possibility of space armies in the future. A number of flight tests have already been carried out on the vehicle, launched from a 747.

AUTHOR: None

ORG: None

TITLE: "Safety First, Improved Service, Strive for Normal Flights"

SOURCE: Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 11, Nov 77 pp 10-11

ABSTRACT: On 15 October, civil aviation organs celebrated in Peking the 20th anniversary of Chou En-lai's injunction to the civil airlines (used as the title of the article). Between 1957 and 1976, passenger capacity increased by 21 times and cargo capacity by 7 times, with a total turnaround capacity increase of 12 times. There are currently over 100 domestic routes connecting 80 different points. There are 9 international routes connecting more than 50 countries and areas, and business relations are maintained with aircraft companies in more than 100 countries. In addition to passenger and freight service and charter and special flights, Chinese civil aviation also performs such services as aerial photography and surveying, forest protection, woodland and crop spraying, other agricultural services and cloud seeding.

AUTHOR: YUAN Li [5013 3810]

ORG: None

TITLE: "Aircraft Speed Brakes"

SOURCE: Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 11, Nov 77 pp 12-13

ABSTRACT: Speed brakes are flaps on an airplane's wings or body which can be extended by hydraulic means to increase air resistance and slow down air speed. The devices are useful in aerial combat as they increase maneuverability and the possibilities for evasion. They are also useful in non-military planes for the increased maneuverability they offer, particularly in landing situations. The use of speed brakes in a military combat exercise is described.

AUTHOR: KAN Ch'ao [3927 6389]

ORG: None

TITLE: "Software Moves: Computer Software and Applications No 8"

SOURCE: Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese NO 11, Nov 77 pp 14-15

ABSTRACT: A current problem of computer development is that hardware is outstripping software. When new machines appear, adaptation to them of programming languages currently in use is extremely time-consuming. For example, ALGOL-60 is currently in use with a range of Chinese machines including the 108, 109, 121, 441-B and 709. LU Ju-ch'ien [7120 3067 6870] of the Computer Facility, Institute of Mathematics, CAS, has developed the XHY compiler to translate such software as ALGOL-60, FCY, XCY, SKY and GCY into forms usable on the 109- 108B, 709 and 121 machines. There is some loss of specificity in this process, but this is within acceptable limits.

AUTHOR: T'AO Wang-p'ing [7118 2598 1627]

ORG: None

TITLE: "Applications of Computers and Digital Circuitry in Airborne Radars: Trends in Airborne Radar Development, 3 (Conclusion)"

SOURCE: Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 11, Nov 1977 pp 16-18

ABSTRACT: Reconnaissance and interference devices are currently integrated, and controlled by computer. When enemy radar emissions are detected, the computer can decide which of several should be jammed. Airborne warning radar is also computer controlled and makes use of digital pulse radars and digital displays. Currently long-range bomber guidance systems combine inertial and Doppler radar guidance. The systems are controlled by a computer, which corrects for gyroscope bias and makes other corrections on the basis of atmospheric conditions and low-frequency location signals. Future developments in computer control of radar include: optimal search methods; optimal allocation of radar emissions to tracking of different targets and to search; adjustment of tracking cycles according to distance and course of enemy aircraft; automated fire control decisions.

AUTHOR: TSOU Sheng-ch'uan [6760 4141 6898]

ORG: None

TITLE: "The Cruise Missile Once Again"

SOURCE: Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 11, Nov 77 pp 19-22

ABSTRACT: The cruise missile is not new. Its precursor was the World War II V-1, and after the war the US and Soviet Union attempted to develop the weapon, but development was hindered by difficulties with guidance and the size and weight of the engine. Only recently has new technology made it an important weapon again. The critical aspect of the system is the terrain comparison radar, consisting of a digital map of the altitudes of the terrain in the area to be overflown. The missile's radar takes an inflight measurement, compares it with its map, and makes corrections to conform to a predetermined course. New engine technology has made the cruise missile small-sized, and with its retractible wings it can be launched from submarines as well as aircraft or the ground. Its main technical characteristics are high accuracy, high penetrability, small volume, low cost and an efficient propulsion system. The main ways of defending against it are: over-the-horizon radar for early warning, patrol planes with a look-down shoot-down capability, radar stations mounted high off the ground (several hundred to 1,000 meters). The next generation of cruise missiles will incorporate rocket-ramjet

[continuation of HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 11,  
pp 19-22]

engines, which will give them a speed of Mach 2-4 rather than the current speed  
of Mach 0.7-0.85; this will greatly increase penetrability.

AUTHOR: CH'EN Kuo-fu [7115 0948 1381]

ORG: None

TITLE: "First Experimental East-West Round-the-World Flight"

SOURCE: Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 11,  
Nov 77 pp 22-24

ABSTRACT: Two major events in the history of Chinese civil aviation were the  
first international flight, to Africa in 1965, and the round-trip flight of 2  
Chinese airplanes to New York, one by a western route and one by an eastern route,  
in March 1974. Both events had the personal attention of Chou En-lai. The flight  
over the North Pacific from Japan to Anchorage was a particularly important  
achievement because of the large expanse of water to be covered and the unfamiliar  
airport procedures.



AUTHOR: SHANG Wen-chou [1424 2429 0719]

ORG: None

TITLE: "Bomb Fusing"

SOURCE: Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 11, Nov 77 pp 25-27

ABSTRACT: The main types of fuses are impact fuses, time fuses and proximity fuses. The first type detonates on impact; there are both influence and delay types. The second type of fuse is timed to detonate at a set time interval after the bomb is dropped and is used primarily in illumination and propaganda shells. The third type exists in active and passive varieties and uses acoustic, optical, electrical or magnetic information to determine the time of detonation. The main components of a fuse are: the igniter; the safety device; the safety mechanism release; the delay or time mechanism; and the igniter train. Diagrams of several types of igniter are included.

AUTHOR: CHANG Ching-t'inh [1728 0513 2185]

ORG: None

TITLE: "Harmful Effects of Dust and Sand on Helicopters"

SOURCE: Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 11, Nov 77 pp 28-29

ABSTRACT: Dust and sand have an extremely deleterious effect on helicopter performance, sometimes reducing surface life to 5 percent of the design figure. The primary effect is on the rotor blades, the leading edges of which may be abraded as much as 3.175 mm in 10 hours of operation under severe conditions. Other systems suffer too: in certain helicopters 40 percent of breakdowns are due to environmental factors and 85 of these to sand and dust. Particularly affected are hydraulic tubing and control cables, but no system is invulnerable. In turbo-shaft engines the main deleterious effect is on the air compressor plate. The chief means of combating the effect of dust is the use of abrasion resistant materials and coatings. Dust separators have been developed for engine air intakes, but so far although these can separate out 70-80 percent of sand and dust, they are heavy and restrict air intake somewhat.

AUTHOR: CH'EN Kuan [7115 0342]

ORG: None

TITLE: "Specific Fuel Consumption of Aircraft Engines"

SOURCE: Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 11, Nov 77 pp 30-33. Text of this article published in JPRS 70798, 17 March 1978, TRANSLATIONS ON PEOPLE'S REPUBLIC OF CHINA, No 420, pp 39-45

ABSTRACT: The efficiency of an aircraft engine can be judged in terms of specific fuel consumption, or the hourly fuel consumption per kilogram of engine thrust. Jet engines tend to have high specific fuel consumption because the thrust is achieved by ejecting large quantities of high-temperature high-velocity gas through the exhaust, so that most of the energy generated in combustion is wasted. The use of an afterburner increases specific fuel consumption even further. Some of the wasted energy can be recovered in turboprop and turbofan engines. In both cases the hot, high-velocity gases drive a turbine (in one case connected to a propeller, in the other to a fan), resulting in an exhaust of lower temperature and velocity. Even so, jet aircraft are much less energy efficient than most other forms of transportation. Fuel economy can be improved by flying at high altitude. Giant fuel trucks have been developed with capacities of 35-40 thousand liters and refueling rates of 1,500-1,200 liters per minute; two of these can refuel a Boeing 707 in 20-30 minutes.

AUTHOR: YING Ming [4481 2494]

ORG: None

TITLE: "Bathless Electroplating"

SOURCE: Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 11, Nov 77 p 33

ABSTRACT: Bathless electroplating techniques are used when it is undesirable or impossible to immerse the entire part in the electrolyte. There are occasions when the part to be plated (a channel or hollow) forms a natural reservoir for the electrolyte; in such cases electrolyte is simply poured in and the negative electrode connected directly to the part. In the brush plating and friction plating techniques the negative electrode is also connected to the part and a small quantity of electrolyte is allowed to pass between a positively charged brush and the surface to be plated. The friction method, in which a cotton pad saturated with electrolyte is directly in contact with the surface, gives particularly high surface quality. The methods are useful in retouching and engine repair, and in some cases in the initial production of parts.

AUTHOR: None

ORG: None

TITLE: "Aeronautical Science and Technology News"

SOURCE: Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 11, Nov 77 pp 34-35

ABSTRACT: Heat conducting tubing is a closed system in which the working liquid evaporates at the hot end, the vapor moves to the cool end and condenses, giving up its heat, and is then brought back to the hot end through capillary tubes. It is used for heat control and cooling on aircraft and space ships, satellites and electronic equipment.

Several aspects of U.S.-Soviet preparations for space war include: killer satellites; satellite-surveillance satellites; use of ground-based optical equipment to take pictures of satellites; and satellite-destroying missiles.

Satellites with large solar collectors will transform solar energy into microwave power and beam it to earth receiving stations. An initial experimental station will have a capacity of 500,000 watts.

[continuation of HANG-K'UNG CHIH-SHIH No 11, Nov 77 pp 34-35]

Superfast cooling is a method of tipping a water-cooled rotating disk into a bath of molten metal; the metal adheres to the disk and then is spun off in the form of wire or powder. The technique can be used to produce boron, silicon and steel fibers with a glass-like structure. Stainless steel fiber with 5 times the usual strength and elasticity has been produced in this way.

Work on seagoing surface-effect aircraft is under way. One such project is the West German X-114.

AUTHOR: CHANG T'ai [1728 3141]

ORG: None

TITLE: "How Do Aircraft Take Off from and Land on Aircraft Carriers?"

SOURCE: Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 11, Nov 77 pp 36-40

ABSTRACT: The difficulties posed by takeoffs and landings on the comparatively small decks of carriers are many. One critical element in the landing procedure is a series of landing lights to guide the pilot into the proper approach pattern and fully automated all-weather electronic landing systems. When the plane lands on the deck it is stopped by arrester cables which are controlled by an under-deck hydraulic system. Should these fail, they are backed up by an emergency landing net. Launching is effected by a catapult system capable of developing a force of up to 6-7 G, which resets itself after the launch. Catapults of the most modern type draw the front wheels of the aircraft forward, a method which produces more stable results and does not require as many personnel to operate it.

AUTHOR: CH'I Fan [6259 0416]

ORG: None

TITLE: "Night Flight"

SOURCE: Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 11, Nov 77 pp 40-41

ABSTRACT: The general characteristics of night and all-weather landing systems are described. During his approach, the pilot must fly through two guidance beams before descending to a level at which visual landing can be carried out. The functions of glide lights, approach lights, runway lights, boundary lights, T lights and barrier lights are described.

AUTHOR: HUA Pao [2901 1027]

ORG: None

TITLE: "Manned Spacecraft Safety and Rescue Techniques"

SOURCE: Peking HANG-K'UNG CHIH-SHIH [AERONAUTICAL KNOWLEDGE] in Chinese No 11, Nov 77 pp 46-48, inside back cover.

ABSTRACT: Safety and rescue techniques are a critical part of manned space flight. The experience of Apollo 13 indicates their importance. When an explosion disabled part of the fuel and power systems in the equipment section, the astronauts moved to the lunar module and corrected their course to take them around the moon and back to earth for a safe splashdown. The fact that the presence of the lunar module was critical to the successful outcome shows the importance of adequate means of escape. Safety features on the Mercury, Gemini, Apollo, Vostok, Voskhod and Soyuz spacecraft for use in different phases of the mission are listed. The operation of a launching pad escape module, the use of an in-flight ejection system, repair in orbit and rescue by means of a space shuttle are illustrated.

8480

CSO: 4009

ARCHITECTURAL JOURNAL

AUTHOR: TAI Nien-t'zu [2071 1819 1964]

ORG: None

TITLE: "On the Problem of Raising the Dwelling Level Within the Limits of Residential Area Standards"

SOURCE: Peking CHIEN-CHU HSUEH-PAO [ARCHITECTURAL JOURNAL] in Chinese  
No 2, Jun 78 pp 1-3, 45

ABSTRACT: While state's investment in providing consumer goods, such as clothes, is constantly recycled for re-investment, it is not so in residential housing, and the low rent covers only maintenance cost. The responsibility of architects is to improve the living standard within the area limits authorized by the state. If the area of a single room dwelling [apartment] is enlarged, it will be necessary to reduce the number of two-room and three-room dwellings. In that case, if 1,000 families are to be housed in the 38,000 m<sup>2</sup> space, some families have to be doubled up. Four principles are here proposed: (1) All unmarried men and women over 13 years of age are to live in separate rooms; (2) No more than 4 persons in a room; (3) A kitchen and a bath for every family; (4) 15 m<sup>2</sup> for one-room family, 23 m<sup>2</sup> for two-room family, 32-34 m<sup>2</sup> for three-room family. Based upon these facts and principles, four different designs for distributing the total area are proposed and compared. Advantages and shortcomings of these designs are evaluated. The front cover of the issue illustrates some residential designs.

AUTHOR: WU Liang-yung [0702 5328 6978]

ORG: None

TITLE: "Creative Achievement of the Monument to the People's Heroes: Commemorating the Twentieth Anniversary of the Completion of the Monument"

SOURCE: Peking CHIEN-CHU HSUEH-PAO [ARCHITECTURAL JOURNAL] in Chinese  
No 2, Jun 78 pp 4-9

ABSTRACT: The Monument to the People's Heroes, the foundation of which was laid by Chairman MAO personally, is now twenty-years old. It now stands opposite to the Chairman's Memorial in T'ien-an-men Square. When various sites for the monument were suggested, it was Premier CHOU who worked diligently for the final outcome. Various designs originally proposed and the considerations and discussions leading to the final design are reviewed. The carvings and the landscaping of the monument are also recalled.

AUTHOR: SHUO Li [6730 4539]

ORG: None

TITLE: "Building Industrialization and Architectural Design"

SOURCE: Peking CHIEN-CHU HSUEH-PAO [ARCHITECTURAL JOURNAL] in Chinese No 2, Jun 78 pp 10-12

ABSTRACT: In view of the fact that the general direction in China is industrialization and mass production, a basic change is called for in the building industry. This basic change involves prefabricated and assembled structural members, including doors, windows, interior and exterior decorations, sanitary equipment, etc, and mechanized on site forming of concrete. Building industrialization will cause problems in architectural designing, and some overly concerned architects may allow industrialization to limit the development of architectural art to cause buildings to be monotonously in a uniformed style, or to make residential dwellings to look like soldier's barracks. Ways of avoiding these pitfalls are suggested.

AUTHOR: TU Hsi-pin [2659 1585 2430]

ORG: None

TITLE: "Some Opinions About Speeding Up the Realization of Architectural Design Standardization"

SOURCE: Peking CHIEN-CHU HSUEH-PAO [ARCHITECTURAL JOURNAL] in Chinese No 2, Jun 78 pp 13-14, 23

ABSTRACT: It is the opinion of the author and colleagues that standardization of architectural design is an important condition for the industrialization of the building industry. For many years, the specifications of the factories, engaged in prefabricating and assembling structural members, are too numerous. Following concrete analysis of the problem, it is believed that the cause of this contradiction is a lack of overall planning and uniformed management. In each locality, the international standard, the ministry standard, the provincial standard, the company standard, etc. exist side by side. The prefabricating plants are processing customer-furnished materials and drawings to add to the number of specifications. There are now so many types of structural members and they cannot be coordinated into sets, neither are they serialized. The condition has been improved somewhat after the key problem was understood to be standardization of architectural designs. Arguments of different viewpoints concerning this problem are also presented.

AUTHOR: LI P'ei-chun [2621 3099 4783]

ORG: Anhwei Provincial Cooperative Group of Architectural Standard Design

TITLE: "Comments on Design Projects of Residences and Dormitories for Workers and Staff Members in Anhwei Province in 1978"

SOURCE: Peking CHIEN-CHU HSUEH-PAO [ARCHITECTURAL JOURNAL] in Chinese No 2, Jun 78 pp

ABSTRACT: From June to September 1977, a program of selecting designs of residential dwellings was launched all over Anhwei Province. Submitted designs should have an area limit of 39-42m<sup>2</sup>/family, or 55-60m<sup>2</sup>/large family, or 6m<sup>2</sup>/person group dormitory. There were the three major indices of area per family, area utilization coefficient, and unit building cost. A total of 309 designs were initially received; they were sent to various organizations for written comments. As a result, 85 designs received recommendation from the first round of selection. These were reviewed by related departments of the Provincial Construction Committee to produce 25 designs for general application in the province. These included 12 designs of workers' and staff members' residences, 8 designs of multi-family residences, and 5 designs of dormitories. The selection process and the advantages and shortcomings of various designs are analyzed.

AUTHOR: None

ORG: Wuhan Municipal Design Institute of City Planning

TITLE: "Planning and Design of the Residential Quarter of Hupei Chemical Fertilizer Factory"

SOURCE: Peking CHIEN-CHU HSUEH-PAO [ARCHITECTURAL JOURNAL] in Chinese No 2, Jun 78 pp 20-23

ABSTRACT: Hupci Chemical Fertilizer Plant is located to the northeast of the county seat of Chih-ch'iang. 1 residential area was selected 500m to the west of the plant, separated by the Yang-chia-tang Reservoir, and about 700m from the center of the town. The area is level, with a few shallow ponds, yet sufficiently high and safe from floods. The number of workers and staff are limited to 2,200 persons, with an additional 2,310 persons belonging to the commercial and service crew. Due to the fact that it was to be a new factory, a family member ratio of 45 percent was taken into consideration. The residential buildings were, therefore, designed for 5,483 persons. The layout of the area, the floor plans of the child-care center, dining hall and kitchen, schools, dormitory rooms for singles, apartments for families, and the hospital are included in the paper. There are also photos of completed buildings.



AUTHOR: None

ORG: The Ninth Design Institute of the Sixth Ministry of Machine-Building

TITLE: "Architectural Design of Dust-proof Workshops

SOURCE: Peking CHIEN-CHU HSUEH-PAO [ARCHITECTURAL JOURNAL] in Chinese No 2, Jun 78 pp 24-29

ABSTRACT: With the development of industry and science and technology, the requirements for environmental cleanliness grow higher and attention is also given to the need for workshops with clean air. The air of a city contains several hundred thousand to a million dust particles/liter, and a three-stage filtration system is required to bring clean air to the dust-proof workshop. The selection of a suitable site, the arrangement of various service buildings, the fire-protection equipment and emergency exits, structures of the walls, doors, windows, and roofing materials, equipment and area for cleaning incoming persons and materials are discussed. The floor plan of the ground level of a certain dust-proof workshop is included, as well as photos of various parts of the building.

AUTHOR: YANG Hung-hsun [2799 7703 8113]

ORG: None

TITLE: "Some Theoretical Problems of Architecture"

SOURCE: Peking CHIEN-CHU HSUEH-PAO [ARCHITECTURAL JOURNAL] in Chinese No 2, Jun 78 pp 30-34

ABSTRACT: As a direct rebuttal against the ideas espoused in a paper "On Architecture and the Aesthetic Characteristics of Architectural Art" by YAO Wen-yuan [1202 2429 0337], appearing in HSIN CHIEN-SHE No 3, 1963, the paper accuses YAO of borrowing the special brand of formalism from the Soviet Union to attack the architects of China. The author defines architecture as a science of the planned construction of a spatial environment for socialist living. The policy of the Chinese communist party regarding architecture is to design "suitable and economical structures and to pay attention to beauty when the conditions permit." On the basis of this policy, architecture is production of direct living and the form and the content are inseparable. Without stating specific problems one by one, the author argues at length in defense of this philosophy of architecture as it is being applied in China.

AUTHOR: CHIANG Ch'ien-sheng [5592 5709 3932]

ORG: None

TITLE: "Autumn Harvest Uprising Exhibition Building"

SOURCE: Peking CHIEN-CHU HSUEH-PAO [ARCHITECTURAL JOURNAL] in Chinese No 2,  
Jun 1978 pp 43-45

ABSTRACT: The Autumn Harvest Uprising, led by Chairman MAO, originated in Li-jen School, of Wen-chia Municipality, Liu-yang, Hunan Province created the first troop of red army composed of soldiers and farmers. The school is now one of the protected historical sites of the nation. In April 1977, the Hunan Provincial Committee ordered an exhibition hall to be built to the west of the original site. The construction began early in May and was completed on 7 August. The layout of the area, the floor plan of the hall, and other drawings of the design are included to explain the intent of the architects. Photos of the original school and views of the new exhibition hall are presented.

AUTHOR: LI Cheng-hsiao [2621 3630 2556]  
TS'AO Hsi-tseng [2580 1585 2582]

ORG: Both of Shensi Provincial First Architectural Design Academy

TITLE: "A New Building of Langchow Glacier and Desert Research Institute"

SOURCE: Peking CHIEN-CHU HSUEH-PAO [ARCHITECTURAL JOURNAL] in Chinese No 2,  
Jun 78 pp 46-47

ABSTRACT: The new building housing the Langchow Glacier and Desert Research Institute of Chinese academy of Sciences was completed in 1976. It forms an addition to the previously completed laboratories of permafrost, sand, mud and rock flow, etc. to become an integrated area for research studies. The overall arrangement and the vertical structures are described with drawings. There are two photos of the exterior view of the building and two photos of the interior of the laboratories.

6168

CSO: 4009

CHINESE AGRICULTURAL SCIENCE

AUTHOR: None

ORG: Paddy Rice Heterosis Utilization Research Team, Hunan Academy of Agricultural Sciences

TITLE: "Studies on the Problems of Heterosis and Male Sterility of Paddy Rice: With Criticism on Several Viewpoints in Genetics"

SOURCE: Peking CHUNG-KUO NUNG-YEH K'O-HSUEH [CHINESE AGRICULTURAL SCIENCE] in Chinese No 1, Feb 76 pp 51-65

ABSTRACT: The following problems are discussed: (1) Research data from 1958 to 1974 are cited to support the claim that heterosis exists in paddy rice objectively in spite of the fact that paddy rice is a self-pollinated plant. (2) Genetic theories on heterosis, including the dominant and the superdominant hypotheses, the theory of simple accumulation and mutual influence of allelomorph and non-allelomorphic genes, the theory of the strongest adaptability of the hybrid to a new environment, the internal contradiction theory proposed by LI Sen-k'o [2621 2773 4430], etc. are evaluated and criticized. It is the viewpoint of the authors that three factors determine heterosis: (a) A degree of difference in the genetic materials of the parent-pair; (b) Complimentary and beneficial direction of the interactions of the genetic materials of the parent-pair; (c) Adaptability to external environmental conditions. All three factors

[continuation of CHUNG-KUO NUNG-YEH K'O-HSUEH No 1, 1976 pp 51-65]

are indispensable. (3) Research data of the fertility rate of  $F_1$  and the rate of reproductive mutation of  $F_2$  of hybrids between hsien and keng types and between wild rice and cultivated paddy rice are used to prove the viewpoint that male sterility in paddy rice is a quantitative characteristic, and not a qualitative characteristic. The fertility of the hybrids can be affected by the environmental condition and be changed by it. (3) The claims of Stevenson of the United States (1954) and others that male sterility and fertility are genetically controlled, one being the dominant (or recessive) and the other being recessive (or dominant) characteristic, there are cell nucleus, cytoplasmic, and interaction of nucleus and cytoplasm sterility, and in the process of fertilization only the cytoplasm of the female and the nucleus of the male participate in the interaction are challenged, citing numerous research data. It is the authors' viewpoint that male sterility in paddy rice originates in the contradiction of the genetic materials of the parent-pair and the direction of action of this type of contradiction. (4) Based upon the above discussion, in order to complete the three lines [the male sterile, the sterile-free, and the restorer lines] of hybrid rice, the goal should be to minimize the contradiction between wild sterile line and cultivated breed, to enlarge the contradiction between mutant sterile line and cultivated breed, and to stabilize and consolidate the contradiction between the hsien and the keng sterile lines.

6168

CSO: 8111/1528

ACTA BOTANICA SINICA

AUTHOR: CHANG Te-i [1728 1795 7328]

ORG: Laboratory of Cell Physiology, Shanghai Institute of Plant Physiology,  
Chinese Academy of Sciences

TITLE: "Selection of Nutrient Mutants of Cultured Tobacco Cells"

SOURCE: Peking CHIH-WU HSUEH-PAO [ACTA BOTANICA SINICA] in Chinese No 1, Mar 78  
pp 1-5

TEXT OF ENGLISH ABSTRACT: Callus cultures initiated from leaves of haploid and diploid Nicotiana tabacum were transferred to a suspension culture and then treated with 0.25% EMS. Selection of nutrient mutant cells was carried out by planting the culture in a medium with 1% beef extract without any inorganic nitrogen. In this medium the normal cells turned brown and quickly died, while mutant cells remained viable and fresh weight increased 14-fold after 14 days. This trait was stable as mutant cells grown in inorganic nitrogen medium without beef extract for 42 days (subcultures for 6 passages) were still adapted to beef extract medium.

The relationship between various levels of beef extract (medium containing no inorganic nitrogen) and growth of normal and mutant cells was studied. Without beef

[continuation of CHIH-WU HSUEH-PAO No 1, Mar 78 pp 1-5]

extract, the normal cells were still viable but grew very slowly. Although mutant cells were able to grow in a 1% beef extract medium, growth ceased at 4%. It shows that some growth inhibitory factors were contained in the beef extract and the mutant cells were resistant to these growth inhibitory factors.

In order to regenerate plants, mutant callus was inoculated onto a beef medium extract containing 2 mg benzyladenine and 0.5 mg NAA per liter. After one month about 10 shoots were obtained (2/3 green shoots, 1/3 albino shoots), while all other mutant calluses could not be regenerated. All the shoots could not produce any roots except those subcultured in the inorganic nitrogen medium.

AUTHOR: CHU Chih-ch'ing [2612 5267 3237]  
SUN Ching-san [1327 2417 0005]  
WANG Ching-chu [3769 2417 7467]

ORG: All of the Institute of Botany, Chinese Academy of Sciences

TITLE: "Cytological Investigation on Androgenesis of Triticum Aestivum"\*

SOURCE: Peking CHIH-WU HSUEH-PAO [ACTA BOTANICA SINICA] in Chinese No 1, Mar 78  
pp 6-12

TEXT OF ENGLISH ABSTRACT: The conditions for inducing pollen embryoids and calluses and the cytological observations of androgenesis in wheat have been studied. Results are summarized as follows:

1.  $N_6$  medium is apparently superior to MS medium for inducing pollen calluses. It is shown that the exogenous hormones are not necessary to initiate the androgenesis, but they can promote further growth of pollen embryoids and calluses.
2. The pathways of the androgenesis have also been investigated with the total amount of the anther. The asymmetric and symmetric divisions in uninucleate microspores both can initiate embryogenesis, but the former is more frequent.
3. The micronuclei cleft from chromosome fragments have been found both in multicellular pollen and in some albino pollen plants. It is deduced that the albino and abnormal pollen plants may originate from the multicellular pollen which contain micronuclei.

[continuation of CHIH-WU HSUEH-PAO No 1, Mar 78 pp 6-12]

4. Both the endoduplication of the nucleus and fusion of free nuclei of pollen are believed to be the main causes for the production of the diploid and multiploid pollen plants.

\* Part of the test data was supplied by comrade YIN Kuang-ch'u [1438 0342 0443].

AUTHOR: CHOU Hsing-min [0719 5281 3046]  
YANG Fu-tun [2799 4395 0937]  
LI Ping-wen [2621 4426 2429]  
LI Chien-hua [2621 0256 5478]

ORG: All of the Ch'ing-hai Institute of Biology

TITLE: "Interrelationship Between Vegetation and Permafrost Along the South Section of the Ch'ing-hai-Tibet Highway"

SOURCE: Peking CHIH-WU HSUEH-PAO [ACTA BOTANICA SINICA] in Chinese No 1, Mar 78 pp 13-19

TEXT OF ENGLISH ABSTRACT: Vegetation and permafrost are mutually affected and limited. The development and penetrating growth of root systems of plants are limited by the low temperatures of permafrost. The homogeneity of vegetation distribution is destroyed by the forming of frost heavings, thawed lakes, landslides and solifluctions. Direct sunlight is weakened by vegetation and much water is depleted by transpiration so that the surface temperature of the ground is decreased. There is a thick peat layer under boggy meadows, exercising protection for the permafrost.

According to the type, structure and specific composition of the vegetation and

[continuation of CHIH-WU HSUEH-PAO No 1, Mar 78 pp 13-19]

surface features of the permafrost, the distributive ranges of the permafrost can be determined.

Since vegetation succession is extremely sensitive to changes of air temperature and soil moisture, the trend of permafrost development may be estimated indirectly.

AUTHOR: HSIAO I-hua [5135 5042 5478]

ORG: Laboratory of Genetics, Department of Biology, Wu-han University

TITLE: "Growth and Development of the Three Lines of Rice Under Various Photo-periodic Conditions"

SOURCE: Peking CHIH-WU HSUEH-PAO [ACTA BOTANICA SINICA] in Chinese No 1, Mar 78 pp 20-25

TEXT OF ENGLISH ABSTRACT: 1. The hybrid rices "Ai-yu No 2" and "Nan-yu No 2" are weakly photosensitive types. Under 10 hours of day-length their heading is accelerated by 18-32 days over that under natural day-length. The corresponding sterile and sterile-free lines are insensitive or very weakly sensitive to short day-length. Their range of acceleration of heading is only 0-3 days.

2. The photoperiodic sensitivity of hybrid rice is determined mainly by their male line (the restorer line) to day-length. This should be taken into consideration in selecting new restorer lines.

3. The vegetative period of "Nan-yu No 2" under the short day-length is shortened by 32 days, while its male and female lines are shortened by 10 days and 1 day respectively. Therefore, inheritance of photoperiodic sensitivity in this hybrid rice is transgressive.

4. Hybrid rices "Ai-yu No 2" and "Nan-yu No 2" display obvious heterosis in comparison with the restorer line IR<sub>24</sub> and the control strain "Chen-chu-ai."

[continuation of CHIH-WU HSUEH-PAO No 1, Mar 78 pp 20-25]

5. Under the natural day-length of Wu-ch'ang, both hybrid rices have 17 leaves on the main stem while IR<sub>24</sub> has 18.

6. Differentiation of young panicle in hybrid rice occurs at the age of 13-13.5 leaves. Panicle differentiation begins in the sterile lines later than in the sterile-free lines by 2-5 days. The date of heading of the sterile lines is later by 2-3 days. For propagation of sterile line or hybrid seed production, it is important to arrange carefully the sowing and transplanting times to make the flowering periods meet, since this difference of heading period between the sterile line and the sterile-free line is not affected by photoperiodic conditions.

\* CH'EN K'o-ch'eng [7115 0344 2052], HO Chih-ch'ang [0149 0037 1603] and HO Fang-lu [0149 5364 4389] took part in portions of the present study.

AUTHOR: TENG Hsi-ch'ing [6772 6932 7230]  
CH'ENG Shih-p'in [4453 0099 0756]  
P'AN Nai-hsin [3382 0035 2450]  
CH'EN Chin-lan [7115 6855 5695]

ORG: TENG of the Institute of Medical and Pharmaceutical Sciences, Kwangsi Chuang Autonomous Region; CH'ENG of the Kwangsi Agricultural College Kuei-pei Subdivision; P'AN and CH'EN both of the Kao-feng Forest Station, Kwangsi Chuang Autonomous Region

TITLE: "The Effects of Ethrel Upon Benzoin Production and Balsamic Ducts of Styrax Hypoglauca Perk."

SOURCE: Peking CHIH-WU HSUEH-PAO [ACTA BOTANICA SINICA] in Chinese No 1, Mar 78  
pp 26-30

TEXT OF ENGLISH ABSTRACT: In seasons of tapping Styrax trees (Styrax hypoglauca Perk.), it is found that benzoin yields will increase significantly if the bark of the stem base was slightly scraped and treated with a 10% oil preparation of ethrel 10-12 days prior to balsam cutting. The average benzoin yield for treated trees has been found to be 8-17 times as much as that of the controls. There are many advantages for application of ethrel, such as convenience, larger productive increment, only slight injury to the bark, and no change in benzoin composition, etc. Thus, ethrel may be applied unquestionably to the purpose of benzoin production.

[continuation of CHIH-WU HSUEH-PAO No 1, Mar 78 pp 26-30]

It is also proved that ethrel can enlarge the size, increase the total number and broaden the distribution ranges of traumatic balsamic ducts, thereby increasing the benzoin yields.



AUTHOR: None

ORG: Terpenoid Research Group, Laboratory of Phytochemistry, Institute of Botany, Chinese Academy of Sciences and Perfumery Research Group, Laboratory of Foods, First Institute of Light Industry, Shantung

TITLE: "Study on the Essential Oils of the Thymus quinquecostatus Celak."

SOURCE: Peking CHIH-WU HSUEH-PAO [ACTA BOTANICA SINICA] in Chinese No 1, Mar 78 pp 31-36

TEXT OF ENGLISH ABSTRACT: This paper presents the chemical constituents of the essential oils of Thymus quinquecostatus Celak. in Shantung province. By applying the following techniques: (a) fractional distillation, (b) column chromatography, (c) TIC, (d) GLC and (e) IR, 16 components have been separated and identified, i.e. linalool, borneol, p-cymene, cineole, carvacrol and others. It is also found that this species in Shantung province has two chemotypes: linalool-type and carvacrol-type. In addition, the variations of content of major components of the oils in various months have been determined.

AUTHOR: WANG Pang-hei [3769 6721 6932]  
TU Yuan-shou [2629 0337 3769 1108]  
CH'I Ming-ch'i [7871 2494 0796]  
WANG Pao-min [3769 0202 3046]

ORG: All of the Laboratory of Plant Physiology, Department of Biology, Lanchow University

TITLE: "Physiological Changes of Wheat Under the Dry-Hot-Wind Condition. II. Effect of Dry-Hot-Wind on the  $^{14}\text{CO}_2$ -Assimilation and Accumulation of  $^{14}\text{C}$ -Assimilates During Grain Filling Period in Wheat"

SOURCE: Peking CHIH-WU HSUEH-PAO [ACTA BOTANICA SINICA] in Chinese No 1, Mar 78 pp 37-43

TEXT OF ENGLISH ABSTRACT: The assimilation of  $^{14}\text{CO}_2$  and the accumulation of  $^{14}\text{C}$ -assimilates during grain filling period of wheat treated with dry-hot-wind were determined. The results are shown as follows:

1. Under the influence of dry-hot-wind, the chlorophyll content decreased and the capacity of  $^{14}\text{CO}_2$ -assimilation was also reduced. Assays of carbohydrate content indicated that the distribution pattern of  $^{14}\text{C}$ -assimilates was changed and the alcohol soluble fraction decreased while the petroleum ether soluble fraction increased. The total  $^{14}\text{C}$ -assimilates accumulated in the grain was reduced to a

[continuation of CHIH-WU HSUEH-PAO No 1, Mar 78 pp 37-43]

low level.

2. The hydrolysis and export of  $^{14}\text{C}$ -assimilates stored in the stem was enhanced and the soluble carbohydrates in the grain were transformed more rapidly into insoluble form, hence the treated plants ripened earlier than did the controls.
3. Wheat injured by dry-hot-wind during the grain filling period did not fully recover even under subsequent favorable conditions.

AUTHOR: WANG I-jou [3769 0110 2677]  
LIU Hung-hsien [0491 3414 0341]  
KUO Chun-yen [6753 0193 1750]

ORG: All of the Laboratory of Plant Physiology and Biochemistry, Kwangtung Institute of Botany

TITLE: "Effect of Chilling Temperature on Plant Metabolism of Hevea Brasiliensis"

SOURCE: Peking CHIH-WU HSUEH-PAO [ACTA BOTANICA SINICA] in Chinese No 1, Mar 78 pp 44-53

TEXT OF ENGLISH ABSTRACT: An occasional cold current from the north often hits some regions in southern China. It causes a sudden fluctuation of temperature and brings chilling injury to those temperature sensitive tropical plants. The experimental results indicated that chilling temperatures had a marked influence on plant metabolism of Hevea brasiliensis. When the temperature dropped below the optimum, and as its period was prolonged, the normal metabolism in the rubber tree was changed. The catabolism of carbohydrates, nitrogen and phosphorus were all enhanced, and their syntheses were inhibited. In particular, toxic substances such as ammonia accumulated in the plant.

AUTHOR: CH'ENG Ching-fu [4453 2529 4395]  
HSU Sheng-hsiu [1776 5116 0208]  
WANG Su-chen [3769 4790 3791]

ORG: All of the Department of Biology, Kiangsi University

TITLE: "The Sporocarps and Cultured Young Sporophytes of Azolla Imbricata"

SOURCE: Peking CHIH-WU HSUEH-PAO [ACTA BOTANICA SINICA] in Chinese No 1, Mar 78  
pp 54-58

TEXT OF ENGLISH ABSTRACT: From May 1976 to July 1977, we made a series of investigations on the sporocarps and cultured young sporophytes of Azolla imbricata (Roxb.) Nakai. It is a green manure for higher yield of rice. We know that the means of cultivation of this plant is restricted to vegetative reproduction. In most cases, Azolla withers in the very hot days in summer and bitterly cold days in winter.

Our preliminary investigation indicates that the sporocarps can resist the unfavorable environment such as high temperature in summer and low temperature in winter. Young sporophytes have high plasticity. Therefore, it is of practical use to adopt sporocarps and young sporophytes as a means of overcoming the unfavorable environment. The appearance of its sporocarps in nature and the cultivated process of the young sporophytes are also briefly described.

AUTHOR: LIU Yung-an [0491 3057 1344]  
K'UNG Chao-ch'en [1313 2507 1368]

ORG: Both of the Institute of Botany, Chinese Academy of Sciences

TITLE: "Plant Fossils of Late Eocene From Wu-ch'eng, Honan and Their Significance in Botany and Paleoclimatology"

SOURCE: Peking CHIH-WU HSUEH-PAO [ACTA BOTANICA SINICA] in Chinese No 1, Mar 78  
pp 59-65

TEXT OF ENGLISH ABSTRACT: This paper records some plant impressions from the Wu-li-tui formation of the Wu-ch'eng basin in T'ung-pai hsien, Honan. The xerophytic Palibinia and small leaves of various kinds of leguminous plants are predominant. One new species, Grevillea densifolia, is described. Based upon the features of this florule, the geological age is assigned to late Eocene. The xerophilous nature of these plants indicates that during that time the Wu-ch'eng basin was a dry and hot region. The discovery of these plant fossils, therefore, has some significance in geological, botanical and paleoclimatological researches.

AUTHOR: HAO Shui [6787 3055]  
HO Shih-kuo [0149 6624 0948]  
CH'U Pao-lan [2575 1405 5695]

ORG: HAO of the Department of Biology, Kirin Teachers' University; HO and CH'U both of the Harbin Institute of Applied Microbiology

TITLE: "Studies on the Heterochromatic Zone of M-Chromosome in Vicia faba"

SOURCE: Peking CHIH-WU HSUEH-PAO [ACTA BOTANICA SINICA] in Chinese No 1, Mar 78  
pp 66-70

TEXT OF ENGLISH ABSTRACT: A method of hematoxylin staining used for revealing the heterochromatic zone of chromosomes in Vicia faba was reported. It was compared with the method of Feulgen reaction after low temperature treatment, and the differences and resemblances between them were analyzed. Based upon the experimental results of this report and the data from other authors' work, the authors suggest that certain transitional degrees between the typical heterochromatic and euchromatic zones should be present. The heterochromatic zone of M-chromosome in Vicia faba was then divided primarily into five degrees and the nature of them was discussed.

AUTHOR: WANG Yung-ch'uan [3769 3057 1557]  
P'AN Kuo-ying [3382 0948 3841]

ORG: Both of the South China Sea Institute of Oceanology, Chinese Academy of Sciences

TITLE: "Studies on the Reproductive Organs of Red Algae. VI. On Some Species of Liagora and the Development of Their Reproductive Systems"

SOURCE: Peking CHIH-WU HSUEH-PAO [ACTA BOTANICA SINICA] in Chinese No 1, Mar 78  
pp 71-75

TEXT OF ENGLISH ABSTRACT: The present paper deals with the structure of the thalli and development of the reproductive systems of four species of Liagora, namely L. pinnata Harv. and L. satchellii Yamada, both from Hsi-sha Ch'un-tao, and L. boergesenii Yamada and L. decussata Mont., both from Taiwan. The development and position of their cystocarpid involucreal filaments and the formation of the gametangial clusters were described. The names of sections were also discussed. It is suggested that the development and position of the involucreal filaments may serve as taxonomic characteristics. The authors agree with Yamada and Chiang that the external feature and position of the gametangial clusters of L. pinnata are easily distinguished from those of the others. We consider the present names of the section (Farinosae, Validae, Mucosae) inadequate.

AUTHOR: HO Hsien-kuo [6320 6343 0948]  
CHIANG Fu-hsiang [5592 4395 4382]  
CHOU Ch'ien-ju [0719 0241 1172]

ORG: All of the Shanghai Institute of Materia Medica, Chinese Academy of Sciences

TITLE: "Some Examples of Application of High Speed Liquid Chromatography in Phytochemistry"

SOURCE: Peking CHIH-WU HSUEH-PAO [ACTA BOTANICA SINICA] in Chinese No 1, Mar 78  
pp 76-83

TEXT OF ENGLISH ABSTRACT: This paper briefly describes the characteristics of high speed liquid chromatography and reports some examples of application in phytochemistry research. Analyses of chemical components of five species of Chinese medicinal plants were carried out on a chromatographic instrument which was built by our institute. They are: Camptotheca acuminata Decne., Euphorbia helioscopia L., Salvia miltiorrhiza Bge., Schisandra sphenanthera Rehd. et Wils., Daphne genkwa Sieb. et Zucc.

The results of separation in the column of pellicular beads packing were compared with those of small porous particles ( $<10\mu\text{m}$ ) packing.

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CSO: 4009

EARTHQUAKE FRONT

AUTHOR: KU Kung-hsu [7357 0501 0650]

ORG: None

TITLE: "Strive to be Strong Through Thoroughly Changing the Present Condition"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 pp 1-2

ABSTRACT: In view of the fact that modernization is the desire of all the people in China, while the key to the four aspects of the modernization movement is the modernization of science and technology, the author feels compelled to make two proposals on the earthquake front: (1) There should be a permanent and comprehensive system in the seventy thousand km<sup>2</sup> area of Peking, Tientsin, T'ang-shan, and Chang-chia-k'ou to observe all ominous signs of earthquake, using the newest and most effective equipment so as to protect the nation's capital, which is located in this active zone. (2) As earthquake is a geophysical phenomenon occurring deep under the ground, it is difficult to forecast quantitatively earthquakes above 5 magnitude on the basis of some comparative statistical data of surface phenomena; therefore, there should be a clear-headed determination to place the dozens of categories of observation on the foundation of physics to avoid wasting efforts on minute factors of very minor importance. This is the first of the two papers written by representatives of the Institute of Geophysics for this issue of the journal.

AUTHOR: HSU Shao-hsieh [6079 4801 3610]

ORG: None

TITLE: "Attack Key Items to Study Principles of Earthquakes"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 p 2

ABSTRACT: Forecasting is based upon an understanding of regularities. Today, understandings of earthquake phenomena originate primarily from observation, as experiments on natural phenomena of such proportions are still very difficult. The key remains the most economical and efficient way of observing earthquake data. In order for China to catch up and surpass the advanced level of such countries as Japan, the Soviet Union, and the United States, the most important job is to accumulate complete and reliable observational data and to carry out comprehensive and periodical reviews of foreign and domestic studies on earthquakes. A comparison of the achievements and shortcomings of earthquake studies in the various regions of the country and in foreign countries is not for the purpose of proving who is better and who is worse. It is to prevent the unnecessary and to avoid making the same mistakes others have made before. This is the second of the two papers written by representatives of the Institute of Geophysics for this issue of the journal.

AUTHOR: HSIANG Ch'un [0686 5028]

ORG: None

TITLE: "Contending Schools of Thought On the Genesis of Structural Earthquakes"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 pp 3-6

ABSTRACT: In this concluding installment of the paper, chapters two and three are included. Chapter two discusses such hypostases as viscous slippage, dehydration, etc., all of which have been proposed to supplement the elastic rebound hypostasis. [It appears that the subject discussed in Chapter one must be the elastic rebound hypostasis.] Chapter three discusses new developments in explaining the genesis of structural earthquakes. Theories such as under complex stress conditions in a depth of thirty-forty km below the ground surface, a normal fault is converted into a reverse fault, or in the process of underthrust, a rock stratum receives uneven friction to produce a shear stress which can create a series of vertical faults and every one of these fault activities forms an earthquake, and other recent theories on the origin of structural earthquakes are explained. This paper is to be continued.

AUTHOR: None

ORG: Survey Team of the State's Earthquake Bureau

TITLE: "Fault Activity Surveillance With the Method of Geodesy"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 pp 6-8

ABSTRACT: Fault activities generally mean the relative movement of the two sides of a fault. The process and form of this movement are rather complex but there are two common conditions. Under the first condition, slow, creeping, and non-elastic motions occur to both sides of a fault. Energy does not accumulate in this type of creeping movement, which is often observable in historically earthquake active regions. For example, along San Andreas fault of North America, the creep is about 1 to 2 cm per year. Under the second condition, the fault receives the action of a stress field to accumulate a strain, which causes the rock body to fold or leads the fault to have violent displacements. In either case, the movement of a fault activity may be described by the vector displacement in the vertical and the horizontal directions. A good survey method and proper computation of the survey data may, therefore, be adopted to study the condition of the fault activity. The method of periodical geodetic surveying of fixed points and the technique of computing the data are described.

AUTHOR: None

ORG: Gravity-1 Group, Wuhan Earthquake Brigade

TITLE: "Gravity and Earthquake"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 pp 9-11

ABSTRACT: This paper explains the subject matter in three chapters: (1) What is gravity: The law of universal gravitation, various related equations are explained as the basis of the theory of gravity. (2) Variations of gravity: Variation of gravity with altitude, variation of gravity with geographical locations, variation of gravity caused by the uneven density of the earth's crust, and variation of gravity with time are explained. (3) Relationship between gravity and earthquake: Before the occurrence of a severe earthquake, due to the accumulation of energy in the vicinity of the epicenter, there are morphological changes which cause a change in gravity, and the material transfer of the earth's crust has different effects on the gravitational field during the three different stages of an earthquake. Foreign and domestic data indicate that there are indeed changes in gravity before and after an earthquake, and obvious changes in gravity have also been observed before and after the earthquakes in Hai-ch'eng and in T'ang-shan. The use of gravity changes to forecast earthquake is still in the research stage, however.

AUTHOR: CHENG Ping [6774 0365]

ORG: None

TITLE: "Why are There Such Differences Within A Distance of A Few Feet?"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 pp 12-14

ABSTRACT: All those who have visited an area damaged by an earthquake or who have experienced an earthquake personally know that the condition of damage to buildings by an earthquake is extremely complicated. Buildings of identical structure do not suffer the same kind of damage. During the earthquakes in Hsing-t'ai, T'ung-hai, Hai-ch'eng, T'ang-shan, etc. although a large number of houses and buildings collapsed, a large number of structures remained undamaged. A few escaped in perfect condition and others were only slightly harmed. The difference in the thickness of the soil layer, in the condition of the geological structure, in the gravel content of the foundation, or in the ground water table has an important effect on the resonance of the building structure. Factors influencing the vibration of buildings and their foundations during an earthquake are explained.



AUTHOR: TS'UI Tso-chou [1508 0155 5297]

ORG: None

TITLE: "Application of Geomechanics in Earthquake Work"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 pp 19-21

ABSTRACT: Earthquake is an expression of modern movement of the earth's crust and is a product of the formation and movement of ectonics; therefore, as far as the genesis and the formation process of earthquakes are concerned, an earthquake is a geological phenomenon. The contents and methods of earthquake geology, i.e. the study of earthquakes from the viewpoints of geomechanics, as proposed by LI Szu-kuang [2621 0934 0342] include: (1) Investigate and identify the activeness of structural zones; (2) Clarify the characteristics of active structural zones; (3) Measurement of ground stress and ground strain; (4) Experimental simulation of ground stress field; (5) Experimental studies on petrodynamics and the process of fracture development. In forecasting earthquakes, earthquake geology emphasizes the identification of earthquake danger zones and the establishment of survey stations to provide a reliable foundation for earthquake forecasting.

AUTHOR: None

ORG: Yen-p'ien Earthquake Station

TITLE: "Variation of Radon Content in the Deep Soil Layer and Earthquake"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 pp 22-24

ABSTRACT: Currently the technique of using the variation of radon density of the ground water to forecast earthquake appears to be very promising, but to a large extent, the success of the technique depends upon the selection of the well for observation. The arrangement of observation points is limited by hydro-geology, hence the quality of the observation. The authors adopted a new technique by burying instruments in the fault zone and eluvial stratum (which the authors call deep soil layer) to withdraw gas and to observe the change in the radon content of the gas. The theoretical basis of this technique, the selection of area for the installation of instrument, the experimental results, and the existing problems are reported.

AUTHOR: LIU Te-fu [0491 1795 1381]  
SUNG Hsiao-t'ing [1375 4562 0080]  
KUO Tseng-chien [6751 1073 1696]  
LI Hai-hua [2621 3189 5478]

ORG: None

TITLE: "Ionosphere and Earthquake"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 pp 25-27

ABSTRACT: When electromagnetic phenomena of the earth are observed and analyzed, the high layer atmosphere that is in an ionized state cannot be ignored. For the purpose of investigating a possible linkage between changes of the ionosphere before the occurrence of a major earthquake and the earthquake phenomenon, records of observed abnormal disturbances of the ionosphere on 27 July 1976, 21 May 1976, 25 January 1972, and 11 May 1974, etc. were studied, as these were the dates before a major earthquake. It appears that the nine-days cyclic changes of certain signs of the ionosphere before and after a major earthquake is by no means accidental. Aside from geomagnetic anomalies, the fault activity may also cause high atmosphere current changes. If a system may be established to observe the electromagnetic field, the atmospheric electrical field, the ionosphere, and the solar activity, the observational data should be extremely beneficial to earthquake forecasting.

AUTHOR: None

ORG: First Earthquake Team, Liaoning Provincial Bureau of Earthquakes

TITLE: "Signs of Change of Gravitational Field Before and After the Hai-ch'eng Earthquake"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 pp 28-29

ABSTRACT: Early in 1972, a line was established in the southern part of Liaoning Province, from Pei-chen to Ying-k'ou, to Chuang-ho to measure, repeatedly, the gravitational fluctuation for the purpose of catching a glimpse of the evolvment and development of a major earthquake. In September of the same year, a gravity survey network was established in Liao-tung Peninsula as well. The data of three gravity measurements, therefore, existed before the 7.3 magnitude earthquake occurred in Hai-ch'eng in 1975. Changes of the gravitational field occurred in the Hai-ch'eng region ever since 1972 and the changes were more obvious in the vicinity of the epicenter. Immediately following the earthquake, measurements were taken again in the same points previously arranged. The survey data are here reported and analyzed.

AUTHOR: LI Ch'i-t'ung [2621 6386 4592]

ORG: None

TITLE: "Gushes of Ground Water and Earthquake"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 pp 31-32

ABSTRACT: On 17 August 1976, water suddenly gushed out of the ground in a commune member's home, in Lung-pen Commune, Kao-yu County, Kiangsu Province. By 15 August 1977, there were 114 gushes of ground water in seven points in Lung-pen. The seven points are distributed within an area of 250 m<sup>2</sup>. All gushes occurred between 17 and 20 hours. The water gushed to a height of 1-2.5 m. The mineralization level and the temperature of the water were rather high. These geysers were of short duration, but they were forceful and very noisy while they lasted. Many earthquakes of 1.4 to 5.5 magnitude occurred in the general region from Sep 1976 to Mar 1977. There appeared to be some correspondence between the frequency of the gushing activities and the earthquake activities. More data are needed for future analysis and study in order to determine the true relationship between these geysers and earthquakes.

AUTHOR: CHANG Meng-shen [1728 1322 3947]  
CHOU Kung-wei [0719 0361 1218]

ORG: None

TITLE: "PTY-8 Remote Seismometric Instrument"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 pp 33-34

ABSTRACT: The PTY-8 seismometer is an all transistor equipment for remote measurement and transmission of earthquake signals. It was designed and produced in China. When it is coordinated with radio broadcasting and receiving equipment, it becomes the important tool of the regional earthquake station network. Its technical indices and work theory are described.

AUTHOR: KU Hao-ting [7357 3185 7844]

ORG: Liaoning Provincial Bureau of Earthquake

TITLE: "We Saw the Ground Light"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 p 34

ABSTRACT: At night, on the fourth of February, 1975, the author and companions were walking on a highway of a general south-north direction from Ying-lo Commune northward to return to Hai-ch'eng. In the vicinity of Chuan-wan-tzu Bridge, they saw ground light and soon afterwards they felt the occurrence of the 7.3 magnitude earthquake. The ground light is described in the paper as having the following characteristics: (1) A bright light projecting forward (northward) at a visual distance of more than 10 km; (2) In even stripes close to the ground surface, different from the reflection of city lights; (3) It lasted 2-3 seconds, with no scintillating phenomenon; the earthquake was felt almost simultaneously as the light disappeared. Judging from the fact that light is transmitted faster than the seismic wave, the light and the earthquake may be judged as occurring simultaneously; (4) It was about 20-30° between the light and the author's angle of vision; therefore the height was at least above 0.5 km. It should have been visible from a far distance. The light emission phenomenon may possibly be related to the rich magnesium reserve of the area and the fracture mechanism of the rocks.

AUTHOR: None

ORG: Ground Inclination Group, Chung-hsin Earthquake Station, Nan-ch'ang Municipality

TITLE: "Adjustment of Starting Balance Position of a Horizontal Pendulum"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 pp 35-36

ABSTRACT: The horizontal pendulum ground inclinometer is an instrument of observation extensively used in the earthquake battle front. In order to improve the observational precision of the instrument, it is very important to adjust it to a balanced position before it starts to record. The rule for this adjustment states that the cycle may vary slightly but the balanced position of the light point should be basically unchanging. This rule is, in reality, difficult to master, due to the mirror surface adhesion and the different positions of the light source and the recorder. It is, therefore, very possible that there may be a considerable deviation between the central position initially selected and the starting position of balance. The authors made improvements to the technique of adjusting the instrument. The concrete procedure and the theory are described.

AUTHOR: None

ORG: Ch'i-chung Earthquake Survey and Report Group, Huang-shih

TITLE: "Understandings in the Application of Deviation Magnetometer"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 pp 37-38

ABSTRACT: The 74 type ceramic angle of deviation magnetometer is a frequently used instrument among the mass observation points. Its design principle is scientifically sound and the materials and the technique of its manufacture are also rather good. When it is correctly adjusted and reasonably used, reliable geomagnetic deviation data may be obtained. Aside from the instructions of the user's manual, certain parts of the instrument require necessary handling and treatment according to theories of optics in order to produce satisfactory results. Procedures required for the refraction system and the light transparent window, and for constructing a platform for the instrument are explained.

AUTHOR: None

ORG: A Reporter of the Journal

TITLE: "On the Seismic Instruments Exhibition"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 pp 39-40

ABSTRACT: During the period of the National Earthquake Front Learning From Ta-ch'ing Conference, more than one hundred seismic instruments, coming from all the different regions of the country were placed in Peking Astronomical Museum for exhibition. They included instruments for observing and monitoring ominous signs of impending earthquake, various seismographs and transmission instruments, experimental equipment, etc. Within the short period of several weeks, more than three thousand persons visited the exhibition. It was the shared feeling of the visitors that these instruments represented an advancement in modernization in China and one of the fruits of Chairman HUA's policy on the earthquake battle front. The history, the structure, and the application of some of these instruments are briefly introduced.

AUTHOR: (1) KAO Ch'iang [7559 1730]  
(2) None  
(3) CH' IEN P'ing [0256 1627]

ORG: None

TITLE: "(1) The Earthquake Survey and Report Group of the Youth Palace of Hsi-ch'eng District of Peking Municipality are Studying to Make a Self-recording Magnetic Deviation Instrument; (2) Insist Upon After-work Survey and Reporting to Improve the Quality of Observation; (3) National Earthquake Front Learning From Ta-ch'ing Conference Seismic Instruments Exhibition (a Portion of the Instruments)"

SOURCE: Peking TI-CHEN CHAN-HSIEN [EARTHQUAKE FRONT] in Chinese No 2, 26 Apr 78 (1) front cover, (2) inside front cover, (3) inside back cover and back cover

ABSTRACT: (1) On the front cover of this issue there is a colored photo taken by the author depicting a group of young persons, members of the Youth Palace and a self-recording magnetometer; (2) Six photos are presented on the inside front cover, depicting, from the left to right, students of the First Middle School Earthquake Survey Group of Pao-shan, Yunnan Province casting corrosion-resistant electrodes, leaders and survey group members of Chia-kung-ho Commune, Chiu-t'ai County, Kirin Province regularly monitor earthquake conditions together, workers of the Electronic Factory of the Department of Physics, Sinkiang University trying to adjust a seismometer, teachers and students of the

[continuation of TI-CHEN CHAN-HSIEN No 2, 1978, front cover, inside front cover, inside back cover and back cover]

Pei-kuan Middle School Earthquake Survey Group, Fei-hsiang County, Hopei Province analyzing data together, members of the Feng-shan Middle School Earthquake Survey Station, Kuangsi Province and the ground electricity self-recording instrument they made by themselves, and a program of earthquake surveying and scientific experimentation launched in Lung-nan Middle School of Kiangsi Province. (3) The inside back cover and the back cover of this issue give photos of some instruments displayed at the exhibition, including the PTY-8 earthquake remote observation instrument, the SYD-1 type 32 pass radio digital remote survey system, the JSZ-2 type intermittent and continuous digital automatic radon determination instrument, the DD-1 type short cycle seismograph designed and made in China, the 76-2 type magnetic amplification style angle of deviation magnetometer, the DSI type portable short cycle minute vibration seismograph, and the SZ-1 type digital clock, on the inside back cover. The JCY-2 type precision laser rangefinder, the LIF-1 type two-pen ground electricity and ground stress recorder, the SD-2 scintillating digital radon test instrument, and the SYL-1 type piezo-magnetic stress analyzer and piezo-magnetic stress gauge with subterranean [under well] pressurizing equipment are on the back cover.

6168

CSO: 4009

SCIENTIFIC EXPERIMENT

AUTHOR: None

ORG: Chu-chou Institute of Electric Locomotives, Ministry of Railways

TITLE: "Shao-shan Type Electric Locomotive"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 4, Apr 78 pp 2-3

ABSTRACT: Various advantages of electric locomotives compared with diesel and steam locomotives are discussed with an emphasis on its energy economy, efficiency and impact on the environment. The construction and the principle of operation of the Shao-shan Type 1 electric locomotive is described and explained.

AUTHOR: CHU Yen-p'ing [2612 1484 1627]

ORG: Shanghai Institute of Experimental Biology, Chinese Academy of Sciences

TITLE: "Research Concerning T'ien-hua-fen Protein--China's Unique, Highly Effective Abortifacient"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 4, Apr 78 pp 4-5

ABSTRACT: T'ien-hua-fen [1131 5363 4720] protein is a drug extracted from the root of Kua-lou [8552 2869] (*Trichosanthes Kirilowii* Maxim) and has been known to be an effective abortifacient since as early as the Ming Dynasty. Clinical tests carried out over the past 10 years so indicate that the T'ien-hua-fen injection was 96 percent effective as abortifacient during mid-term pregnancy (4-6 months). Experimentally T'ien-hua-fen protein has been found to attack selectively the placenta cells and cause degenerative destruction of these cells. Physiology of pregnancy and parturition, the mechanism of abortion in general and one induced by T'ien-hua-fen in particular and the theoretical and practical significance of T'ien-hua-fen protein as a drug for treatment of women's diseases and as a contraceptive are briefly discussed.

AUTHOR: CH'EN I-liang [7115 6318 6156]

ORG: Institute of Air Conditioning Technology, Academy of Construction Science, State Construction Commission

TITLE: "Dehumidification of Air"

SOURCE: Peking K'0-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 4, Apr 78 pp 8-9

ABSTRACT: The importance of dehumidification of air especially in today's production plant and a brief history and development of various dehumidifying materials and techniques are described. An industrial scale dehumidification system of absorption type using lithium chloride as the absorbing agent is described in detail with schematic diagrams and other drawings and photographs. Typical applications of such a system are also discussed briefly.

AUTHOR: None

ORG: This journal

TITLE: "Some New Achievements of Science and Technology"

SOURCE: Peking K'0-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 4, Apr 78 pp 10-11

ABSTRACT: The following five topics are taken from recent discoveries, inventions, creations and progress in the field of science and technology and reported: 1) Ultra heavy weight rotor groove milling machine model X9721 has been designed and constructed by the combined effort of Shanghai Electric Plant of Peking First Lathe Plant, Peking Optical Instrument Plant and Peking Low Voltage Electric Instrument Plant. 2) SG-71 worm-and-pinion power transmission system has been manufactured by Shou-kang Machinery Plant. 3) Small diameter diamond drill bits for geological exploratory drilling has been successfully produced by the Peking Geological Bureau. 4) Preheated air magneto-fluid dynamic power generator model SM-4 has been successfully constructed and tested by the Shanghai Electric Plant. It uses preheated air at a temperature of 1450 degrees C and delivers a maximum power of 18 kilowatts. Its power density reaches as high as 2200 kW/m<sup>3</sup>.



[continuation of K'O-HSUEH SHIH-YEN No 4, Apr 78 pp 10-11]

5) Self-hardening sand prepared from an extra-fast cement has been developed by the combined effort of the Academy of Construction Materials and Shanghai and Peking First Ministry of Machine Building. This sand is especially suitable for making sand cores used in casting.

AUTHOR: CHI Ch'un [6060 5028]

ORG: Institute of Mathematics, Chinese Academy of Sciences

TITLE: "Introducing Science Worker Lu Ju-ch'ien - A Person Who Reaches for the Summit"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 4, Apr 78 pp 12-13

ABSTRACT: This is a short chronicle of struggle, dedication and achievements of comrade Lu Ju-ch'ien [7120 3067 6870]. His major achievements include for example creation of an expanded ALGOL system for the home-made computer system DJS-21, compilation of a powerful systems collective compilation language XHY and more recently completing a translation of an extremely difficult process design language ALGOL 68 and also writing a "guide" book to help other science workers in learning this new language.

AUTHOR: LU Ming [7120 2494]

ORG: None

TITLE: "Software and Series Software"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 4,  
Apr 78 pp 13-14

ABSTRACT: The interaction between the components (hardware) of an electronic digital computer and the role played by the software and the importance and the general concept of "series software" are explained. This series software works as an exchange between programmer's language and machine language. It will translate any programmer's language into an abstract collective compilation language XHY which, in turn, can be translated into any specific machine language. This system enables a user knowing only one programmer's language to gain access to almost any type of computer.

AUTHOR: None

ORG: Systems Group, Institute of Data Communications Technology, Ministry of Posts and Telecommunication

TITLE: "Data Communication - Part I"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 4,  
Apr 78 pp 17-19

ABSTRACT: The importance and the characteristics of data communication and the role played by the electronic digital computer in it are discussed in general. Some examples of the applications of data communication are described with an emphasis on how such system is capable of achieving the four major goals: more, faster, better and more economical. A typical data communication system is illustrated on the back cover: 1) Data processing center, 2) Data exchange, 3) Data collector, 4) Data terminal (customer).

AUTHOR: LI Huan-chu [2621 3562 4251]

ORG: Electric Wave Propagation and Antenna Specialty, Wu-han University

TITLE: "Troposphere Scattering Communication"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 4,  
Apr 78 pp 22-24

ABSTRACT: Ultra-short wave and microwave communications used to be limited to the line-of-sight communication. This barrier has been broken since the discovery of the phenomenon of troposphere scattering of these waves and the appearance of more powerful transmitters and receivers. A brief history of telecommunication leading to the discovery of troposphere scattering, the theory of wave propagation by means of troposphere scattering and the characteristics of communication via troposphere scattering are discussed.

AUTHOR: None

ORG: Chemistry Department Plant, Peking University

TITLE: "A New Adhesive - Oxyphobic Glue"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 4,  
Apr 78 pp 24-25

ABSTRACT: A new type of adhesive known as oxyphobic glue is only about 10 years old today. Oxyphobic glue derived its name from the fact that it can solidify only in an oxygen-free environment. The composition of the glue, the method of application of the glue, the glue's excellent performance characteristics and its various applications, especially industrial applications, are discussed.

AUTHOR: MENG Ch'ing-an [1322 1987 1344]

ORG: None

TITLE: "Nuclear Magnetic Resonance"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 4, Apr 78 pp 26-27

ABSTRACT: The phenomenon of nuclear magnetic resonance (NMR), the principle of NMR spectrum with its applications to the measurement of earth's magnetic field and to the study of microstructures of organic compounds are discussed. The following topics are also mentioned as the more recent developments in the field: Double resonance technique; Solid high resolution method; An imaging method with which a picture of hydrogen atom density distribution over a cross-section can be made. This method has potential application in medicine.

AUTHOR: YANG Wei-hua [2799 5588 5478]

ORG: Kuei-yang Institute of Geochemistry, Chinese Academy of Sciences

TITLE: "Mathematical Geology - A New Fringe Science"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 4, Apr 78 pp 28-29

ABSTRACT: A new fringe science known as mathematical geology has been born from a marriage between geology, mathematics and electronic computers so that mountainous data gathered by the latest technological means such as earth resources satellites can be processed and studied. This marks a beginning of transition from an experimental, subjective, observational reflection to a scientific, abstract, dialectical deduction in the study of geology. The so-called fixed model and statistical (or random) model are described with more detailed explanation given to the statistical models that are popular today. Practical application of the statistical model and the concept of "tendency surface" to exploration of underground resources is also discussed.

AUTHOR: SHEN T'ai-ch'ang [3088 3141 2490]

ORG: None

TITLE: "Guided Missile"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 4, Apr 78 pp 36-38

ABSTRACT: Various aspects of guided missiles are discussed in general, including the following specific topics: 1) Ballistic guided missile; 2) Winged guided missile; 3) the warhead; 4) the guidance and control systems; 5) the power plant and 6) the shell.

AUTHOR: None

ORG: NCNA

TITLE: (A) "Scientific Research Achievements of Chinese University of Science and Technology" (B) "Observation and Study Tour Abroad Made by Chinese Scientists"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 4, Apr 78 Inside from cover (A) and Inside back cover (B)

ABSTRACT: (A) (1) Astrophysics group has published more than 30 papers considered to be significant here and abroad on various subjects including "Later Stage Evolution of Fixed Stars," "Stellar Structures," "Gravitational Theory," etc. This group has been judged as the advanced group of this school.

(2) The laser chemistry group has constructed by themselves experimental equipment and successfully carried out research works concerning separation of isotopes by means of laser. This is another advanced group of this school. The picture depicts their experimental work in the lab.

[continuation of K'O-HSUEH SHIH-YEN No 4, Apr 78 Inside front cover (A) and Inside back cover (B)]

(3) Young teachers belonging to the transformer improvement committee of statistical computation and planning specialty, Department of Mathematics, have carried out a study of the transformer design by applying the optimization theory and with an aid of an electronic computer. This picture shows these teachers studying an improved transformer design with the technicians in the factory.

(4) Teachers belonging to both geochemistry group and computational mathematics group have worked together to gain significant results of finding rich iron ore deposits from an analysis of the tendency surface by application of the methods of mathematical geology and geochemistry.

(5) Teachers from four departments worked in cooperation with the technicians of the Huang-ho River Authority and succeeded in constructing an automatic pipe-line sand content indicator. The first of these instruments manufactured at the school plant will be available soon.

(B) (1) The leaders of the Chinese Academy of Sciences, Professors Ch'ien San-ch'iang [6929 0005 1730], T'ung Ti-chou [4547 1717 0719], Wang Ying-lai [3760 2019 4202] and Wang Shou-wu [3769 1343 2976], have visited a radio

[continuation of K'O-HSUEH SHIH-YEN No 4, Apr 78 Inside back cover]

astronomy station situated at the outskirts of Canberra, Australia. The picture was taken with the President of the Australian Academy of Sciences, Prof. Owence.

(2) Under the leadership of Prof. Chang Wen-yu [1728 2429 5940], Director of the Institute of High Energy Physics, Chinese Academy of Sciences, a group of Chinese high energy physicists visited the hydrogen bubble laboratory of the Japanese High Energy Physics Research Institute.

(3) A chemistry study group under the leadership of Prof. T'ang Ao-ch'ing [0781 2407 1987], Deputy Director of the Kirin University Revolutionary Committee, visited M.I.T., U.S.A.

(4) A heavy ion study group under the leadership of Prof. Yang Ch'eng-chung [2799 3397 0022], a nuclear physicist, visited the electron synchrotron of the Hamburg High Energy Research Institute, Federal Republic of Germany.

[continuation of K'O-HSUEH SHIH-YEN No 4, Apr 78 Inside back cover]

(5) Prof. Lin Lan-ying [2651 5695 5391] of the Solid Physics group, Chinese Academy of Sciences, visited the Solid Physics Research Institute of the Sixth University, Paris, France and discussed the prospect of future development in the field of solid physics with Prof. Balansky.

(6) The acupuncture effect and principle committee of the Chinese Academy of Sciences under the leadership of Prof. Chang Hsiang-t'ung [1728 7449 2717], Shanghai Institute of Biochemistry, attended a conference on the principle and technique of acupuncture and anesthesia. The picture shows Prof. Chang delivering an address at the welcome party held at the Japanese Institute of Mental Health.

(7) The remote sensing technology study group of the Chinese Academy of Sciences visited Leiden University, London. The group leader Prof. Ch'en Shu-'eng [7115 6615 1756] is shown exchanging literature with President Fuller of the School of Natural Sciences, Leiden University.

9113

CSO: 4009

AUTHOR: None

ORG: Ion Probe Research and Manufacturing Group, Scientific Instruments Plant, Chinese Academy of Sciences

TITLE: "China's First Ion Probe"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 5, May 78 pp 2-3

ABSTRACT: Article discusses the LT-1 scanning ion probe mass spectrum micro-analyzer, which was designed and built by the technical staff of the Scientific Instruments Plant of the Chinese Academy of Sciences and which is claimed to be on an advanced level equal to similar devices built in Western nations. It consists of an ion emission gun, an ion optic system, a double focusing mass spectrum analyzer, a vacuum system, a receiving and indicator system and a digital computer. A diagram of the instrument and its operation is presented. Its principles of operation are described in detail. It is described as being capable of detecting impurity elements in amounts of several parts per billion and of detecting elementary boron as an impurity in such semiconductor materials as silicon in amounts of 1 part per 100 million. Various applications of the device are mentioned. Front cover of issue shows a photograph of the instrument being operated by a technician.

AUTHOR: (3) KUO Li-chuan [6753 7787 1227]

ORG: (1) Ultracentrifuge Research and Manufacturing Group, Biophysics Institute, Chinese Academy of Sciences; (2) Scanning Image Treatment System Battle Group; (3) Genetics Institute, Chinese Academy of Sciences

TITLE: (1) "Sixty-Thousand Revolution Ultracentrifuge" (2) "Scanning Image Treatment System with Wide Applications"; (3) "Bright Future for Corn Pollen Breeding"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 5, May 78 pp 4 and 5 and bottom p 3

ABSTRACT: (1) The CL-60 ultracentrifuge is described. It is a gear-driven centrifuge powered by a high-speed electric motor and is capable to 60,000 revolutions per minute. The centrifuge head carries eight 10 ml centrifuge tubes. It is made up of a vacuum centrifuge chamber, the centrifuge head, a drive system, a lubricating system, a temperature control system and a speed and safety control system. A photograph of the apparatus and two diagrams accompany the article. (2) Article describes a scanning image treatment system developed the the Geography Institute of the Chinese Academy of Sciences and other cooperating institutions. It was built entirely of

[continuation of K'O-HSUEH SHIH-YEN No 5, May 78 pp 4 and 5 and bottom p 3]

components manufactured in China. It consists of a color-separating scanning number converter, a scanning drawing apparatus, a control device and a computer. The operation of each of these components is described and the uses of the device are discussed. A small photograph of the apparatus accompanies the article. (3) Chinese success in developing a diploid self-pollinating strain of corn are discussed. Research in this field has advanced rapidly since 1975. Study has been conducted by the Botany Institute of the Chinese Academy of Sciences and the Kuangsi Corn Institute on a cooperative basis as well as by the Kuangsi Agricultural College and the Genetics Institute of the Chinese Academy of Sciences.



AUTHOR: YIN Tsung-min [3009 1350 2404]

ORG: None

TITLE: "Fiber Optics"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 5, May 78 pp 6-7 and bottom p 13

ABSTRACT: Article discusses fiber optics, which is concerned with the mechanisms of transmission of light beams and images in transparent optical fibers. The nature of optical fibers is discussed. The following topics are also discussed: Penetration rates, resolving power, fiber optical periscope and endoscope systems, fiber optics surface plates, self-focusing fibers and W-shaped optical fibers. Article indicates that rapid development in this field is now in progress following a period of decline attributed to the "Gang of Four." Article includes seven figures.

AUTHOR: WANG Ying-hua [3076 5391 5478]

ORG: None

TITLE: "Photoconductive Fiber Communications"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 5, May 78 pp 8-9 and bottoms 10-11

ABSTRACT: This is a general article dealing with photoconductive fiber communications. It deals with the mechanism of communication by this means and with the large communications capacity of this means of transmission. These and other points of superiority are pointed out. It is also indicated that photoconductive fiber communications has broad applications in such areas as eliminating high voltage interference in communications networks and in eliminating current interference in control systems for aircraft. It is pointed out that this form of technology is still in the developmental stage. Article is accompanied by three figures and a photograph showing a photoconductive fiber produced at the Shanghai Silicate Institute.

AUTHOR: SHIH Ling-erh [0670 7227 1422]

ORG: None

TITLE: "Composite Optics"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 5,  
May 78 pp 10-12

ABSTRACT: Article deals with a new branch of science developed in the late 1960's, composite optics. It presents a general description of the principles of and the problems with which composite optics deals. Descriptions are presented of the most important kinds of composite optics equipment, including membrane lenses and membrane prisms, membrane lasers and membrane regulators. The author expresses the belief that the Chinese people will make definite contributions to this new branch of science. The article is accompanied by eight figures.

AUTHOR: SUNG I-Ch'ang [1345 1355 2490]

ORG: None

TITLE: "Laser-Guided Weapons"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 5,  
May 78 pp 14-15 and bottom p 26

ABSTRACT: The article presents a general discussion of laser-guided weapons and of laser-guided bombs in particular. Article includes five figures illustrating the structure of laser guided weapons and their operation. Figure 5 illustrates how a laser-guided bomb would be directed at a target with the aid of target-spotting aircraft which directs a laser beam at the intended target.

AUTHOR: KU Wei-tsao [7357 4850 5679]

ORG: None

TITLE: "Air Membrane Cooling"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 5,  
May 78 pp 16-17 and bottom p 19

ABSTRACT: Article discusses a new method for cooling the surfaces of metal equipment called air membrane cooling in which the heat of the metal is lowered by surrounding it with cool air or other gases. Article includes seven figures illustrating operation of the technique.

AUTHOR: HO K'un-pao [0149 0981 1405]

ORG: Agricultural Motion Picture Studio

TITLE: "A New Photosensitive Material - Silver Bleaching Method Color Film"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 5,  
May 78 pp 18-19

ABSTRACT: The article presents a general description of silver bleaching method colored film in which the film consists of three colored layers, a yellow layer, a red layer and a blue layer and in which silver acts to destroy portions of the dyes in the course of forming the colored image. The advantages of the method are discussed as well as its uses in industry, technology, printing and motion pictures. The article is accompanied by three figures illustrating the procedure. The back cover of the issue consists of diagrammatic flow sheets illustrating the process.

AUTHOR: CHAO Nan-sheng [6392 0589 3932]

ORG: None

TITLE: "Interstellar Space - A "Laboratory" with Extremely Low Temperatures, an Ultrahigh Vacuum and Various Types of Radiation Activity"

SOURCE: Peking K'O-HSUEH SHIH-YEN [SCIENTIFIC EXPERIMENT] in Chinese No 5, May 78 pp 24-26

ABSTRACT: This is a general article dealing with what can be learned about stars and space, including the chemical composition of stars, interstellar gases, the composition of interstellar dust and radiation in interstellar space. The author concludes that interspellar space will be employed as a "laboratory" for future work in physics, chemistry, biology and other sciences.

10,019

CSO: 4009

GEOGRAPHICAL KNOWLEDGE

AUTHOR: CHUANG Chien-t'ing [1641 1696 0080]

ORG: None

TITLE: "Development of Civil Aviation in Sinkiang"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] in Chinese No 2, Feb 78 pp 7-8

ABSTRACT: The first Hami-Urumchi-Ining air service was inaugurated 30 years ago. After 1950, seven more air routes were opened, linking Urumchi with Keshgar, Hotien, Altai and Karamai. In 1971 the Urumchi airport was rebuilt to accommodate jet planes, and direct flights were extended to Lanchow, Peking and Shanghai. Air cargoes brought into Sinkiang include insecticides, fertilizer, medicine, seeds and machinery. Air cargo is brought out of Sinkiang include breeding goat from Ining, grapes from Turfan, and melons from Hami. In the last 20 years, passenger transportation has increased four times. A special aviation squad was formed for insect control, forest fire fighting, first aid, seeding and mineral exploration. In 1977, the area of farmland sprayed with insecticides from airplanes exceeded the original annual plan by 30 percent.

AUTHOR: NING Hsuan [1380 2537]

ORG: None

TITLE: "The All-Season Fragrant Capital of Kwangsi -- Nanning"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] in Chinese No 2, Feb 78 pp 13-15

ABSTRACT: Nanning, the capital of the Kwangsi Chuang Autonomous Region, is located at the center of the 2,000 square kilometer Nanning Basin in southern Kwangsi drained by the Yung River. In the north of the city rises the 487 meter high Shih-heng Mountain. In the south and southwest lies a low hilly land, about 150-300 meters above sea level. The average temperature in the vicinity of Nanning is above 10° C, and the average precipitation around 1,300 mm a year. In the city one can find not only Ginkgo, Lycopodium cernuum, and Codium mucronatum, but also Eucalyptus globulus, rubber, pineapple and citronella imported from tropical zones. At the Nanhu Park, 1600 species of medicinal herbs are grown. Since the establishment of the Chuang Autonomous Region in March 1958, seven institutions of higher learning, including the Kwangsi University and the Kwangsi Agricultural

[continuation of TI-LI CHIH-SHIH No 2 Feb 78 pp 13-15]

College, have been established, the number of primary and middle schools has increased ten times, 40 highways have been built, and direct air services have linked Nanning with Peking, Changsha, Canton, Kunming and Hanoi. A hydro-electrical power plant over the Yung River was built in 1964. The value of light industrial products, including canned fruits, sugar, paper, silk, glass and aluminum utensils, represents 63 percent of the total value of all industrial products. In 1976, 13,500 tractors and 30,000 diesel engines were built. The city is inhabited by the Hans, Yaos, Miaos and Chuangs.

AUTHOR: None

ORG: Department of Geography, Southwest Normal College

TITLE: "The Chingsha River"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] in Chinese No 3 Mar 78 pp 1-4

ABSTRACT: The Chingsha River represents the upper section of the Yangtze River from Yushu in Chinghai Province to Iping in Szechuan Province where it meets the Ming River. Traversing through Chinghai, Tibet, Szechuan, and Yunnan provinces in a north-south direction through mountains 3,000-6,000 meters high, this section of the Yangtze is 2,300 kilometers long and drains a total area of 340,000 square kilometers. The average temperature in the river valley varies from 5.7° C in the northern section to 19° C in the southern section. The average annual precipitation also varies greatly -- 600 mm in the northern section, 600-800 mm in the middle section, and 1,000-1,200 mm in the southern section. The contrast between the wet and dry season is sharp. Navigation is hazardous because of the rapids, the narrow riverbed, and the winding course of the river. Timber, medicinal herbs, fruits, iron and copper are the main natural resources. The

[Continuation of TI-LI CHIH-SHIH No 3, Mar 78 pp 1-4]

river valley is inhabited by mostly Tibetans in the north, and by the Yis, Miaos, Huis, Chuangs, Peis, Puis, Pulangs and other minority groups in the south. Since the Communist take-over of China, four highways have been built: the Szechuan-Yunnan Highway (Chengtü-Hsichang-Kunming); the Northern Szechuan-Tibet Highway (Chengtü-Changtü-Lhasa); the Southern Szechuan-Tibet Highway (Hsingtüchiao-Patang-Lhasa); and the Yunnan-Tibet Highway (Kunming-Mangkang).

AUTHOR: TENG Li-yu [6772 4539 0645]

ORG: None

TITLE: "The Tibetan Prairie"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] in Chinese No 3 Mar 78 pp 5-6

ABSTRACT: Two distinct geographical areas -- the mountain prairie in southern Tibet and the alpine prairie in northern Tibet -- are discussed in this article. The southern prairie lies south of the Kang-ti-szu Mountain and is traversed by the Tsangpo River and its tributaries (the Lhasa and the Nienchu Rivers). This area is benefited by the warm and humid air from the Indian Ocean blown in through the Tsangpo River valley. The alpine prairie is located north of the Kang-ti-szu Mountain at an elevation of 4,500 meters above sealevel. Grazing grass, not taller than 5 cm, covers only 35 percent of the prairie. At the center of the northern prairie is the Chiangtang grassland, where the Na-mu Lake, the highest lake in the world, is located. On the shore of the lake, *Lasiogrostis splendens* (Trin) Kunth grows. The author also noted the presence of many small marsh prairies in lake basins in both northern and southern Tibet. The aggregate area of these

[continuation of TI-LI CHIH-SHIH No 3, Mar 78 pp 5-6]

marsh prairies is approximately 60,000 square kilometers. Located in lowlands where wind and frost are less severe, these marsh prairies, which can provide 500-1,000 chin of feeding grass per mou, are ideal over-winter havens for livestock. Yaks, mules, goats and antelopes are widely seen on the prairie.

AUTHORS: YAO Shan-ming [1202 0810 2494]  
CHENG Chang-su [6774 7022 5685]  
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ORG: None

TITLE: "Yun-t'ai Mountain and Lien-yun Harbor"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] in Chinese No 3, Mar 78 pp 11-13

ABSTRACT: Located in northern Kiangsu, the Lien-yun Harbor is at the eastern terminal of the Lunghai Railway. Backed by the Yun-t'ai Mountain (about 600 meters above sea level), the harbor is sheltered by the Eastern and Western Lien Islands. The strait between the harbor and the islands is named Ying-yu-men, is 2-3 kilometers wide and 4 kilometers long, and runs in a NW-SE direction. The ice-free Lien-yun Harbor is an entreport between Shanghai, Tsingtao and Ta-lien. Its exports include coal, alum, gunny bags, and cotton, while its imports include sugar, chemical fertilizers and steel. The development of this harbor dates back to 1912 when the Lunghai Railway was built with loans from Belgium. Now the harbor has 5 berths for 10,000-ton vessels and 2 berths for 5,000-ton vessels. The volume of goods



[continuation of TI-LI CHIH-SHIH No 3, Mar 78 pp 11-13]

handled by the harbor in 1977 is 78 times that handled in 1949. About 80 percent of the loading and unloading operations has been automated.

AUTHOR: None

ORG: Department of Geography, Kirin Normal University

TITLE: "Marshland Study Brings Fruitful Results"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] in Chinese No 3, Mar 78 p 13

ABSTRACT: There are approximately 110,000 square kilometers of marshland in China containing peat and other valuable resources. The results of a marshland study have been presented as a chapter in a book titled "Physical Geography of China." In 1970, the Kirin Normal University established an experimental plant for the utilization of peat. Four kinds of peat fertilizers produced by this plant have been used with good results at 20 communes in Kirin Province. Four kinds of construction materials (peat board, peat tiles, peat insulation bricks and peat insulation tubes) were also successfully made. A certain type of peat can be used as fuel to heat malt in the process of whiskey making. New applications of peat have been found in medicine, water purification, and in the manufacturing of electrodes for condensers.

AUTHOR: None

ORG: Coastline and Estuary Specialization Group, Department of Geography, Hangchow University

TITLE: "Transformation and Development of Specialized Studies During the Practice of the Three Great Revolutions"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] in Chinese No 3, Mar 78 p 14

ABSTRACT: Since the cultural revolution, this specialization group has participated in the first phase of the Wenchow Harbor project (completed in November 1970), and the Chenghai Harbor Construction project at the Yung River estuary in Chekiang Province. It has undertaken research work and built a model for the Haimen Harbor in Kiangsu Province. This group has also built a sedimentation laboratory, a chemical analysis laboratory for sediments, a mineral analysis laboratory, a soil mechanics laboratory, and an estuary model-making laboratory. New equipment acquired includes a complete set of instruments for harbor hydrographical survey, and instruments for clay and mineral analysis. The number of faculty members and laboratory technicians has tripled as compared to the pre-cultural revolution

[continuation of TI-LI CHIH-SHIH No 3, Mar 78 p 14]

years. Three classes of students have been enrolled from coastal provinces.

AUTHOR: HO Hsiang-i [6320 3276 6654]

ORG: None

TITLE: "Build Terraced Fields in Red Loam Hilly Region"

SOURCE: Peking TI-LI CHIH-SHIH [GEOGRAPHICAL KNOWLEDGE] in Chinese No 3, Mar 78 pp 30-31

ABSTRACT: The red loam hilly land south of the Yangtze River generally refers to the hilly region in Kiangsi, Hunan, southern Anhwei, southern Hupei and western Chekiang between 25° and 30° N. With subtropical climate, this region has an annual average temperature of 16°-20° C, and an annual average precipitation of 1,000-2,000 mm. The author pointed out the uneven distribution of top soil and fertility along the hill slopes, and the serious soil and water erosion at the upper part of the hills. He suggested that the building of level terraced fields on the hill slopes is a measure to improve microtopography, and to minimize the unfavorable topographical effect on soil. The terraced fields can retain a large amount of rainfall and prevent the formation of run-off. The surplus water is drained through ditches at the edge of the field. According to the Kiangsi Red Loam Research Institute, the organic contents in the red loam from a

[continuation of TI-LI CHIH-SHIH No 3, Mar 78 pp 30-31]

three-year old terraced field is 0.51% higher than that from an unimproved field; total nitrogen, 0.047% higher; and total phosphorus, 0.049% higher. Irrigation and forestation are important measures to moderate the drastic change from wet to dry season. The terraced fields should be parallel to the contour lines. The drop between any two points on the field should not exceed 2 meters. Properly planned, terraced fields should be accessible by motor roads and lend themselves to mechanical farming.

1004

CSO: 4009

SCIENTIA GEOLOGICA SINICA

AUTHOR: YIN Tsan-hsun [1438 6363 8113]

ORG: None

TITLE: "Emergence and Development of Plate Tectonics"

SOURCE: Peking TI-CHIH K'O-HSUEH [SCIENTIA GEOLOGICA SINICA] in Chinese No 2, Apr 78 pp 99-111

TEXT OF ENGLISH ABSTRACT: Traditional geology holds that stable platforms and mobile geosynclines evolve essentially in situ. Vertical movements predominate, horizontal displacements being merely a corollary derived therefrom. Episodic orogenies were separated by long periods of quiescence; each of them occurred simultaneously in different geosynclinal regions of the world. The earth, thus depicted, is composed of stereotyped, horizontally immobile, laterally isolated and mutually independent crustal blocks. The nature and evolution of our highly complicated planet are, to say the least, drastically distorted by geologists of older generations.

China learned modern geology from the West and was consequently doomed to hold the same views prevalent in the West. Now, the more and more firmly established plate

[continuation of TI-CHIH K'O-HSUEH No 2, Apr 78 pp 99-111]

tectonics begins to shed light on different branches of geology and the latter should deservedly be labelled plate geology. Although plate geology is yet in its infancy, a promising future can already be visualized. This overwhelming breakthrough may be compared with that of physics, flourishing since the last decade of the 19th century, and with that of recently blooming molecular biology.

The plate theory results from the collaboration of a host of sciences and technologies, chiefly geophysics and geology. Further advances require closer collaboration of these and other disciplines in the elucidation of the present state and the origin and evolution of the whole earth, including the solid body, the atmosphere and the hydrosphere. A new and more comprehensive science will emerge from wider and closer collaboration, which should be named geosematology instead of geonomy. The latter term, besides the equivocal etymology of its second half, may easily be confounded with 'geonomy,' or wrongly affiliated with the Greek word 'geonomos,' both of which bear quite different meanings and should be discarded.

Traditional geology is a part of natural history, essentially limited in two dimensions of the earth's surface. The emerging geology tries to develop its third dimension and begins to tackle materials beneath the crust and to speculate on the properties of the inner spherical layers of the earth. Traditional geophysics acts in its three dimensions, but is confined to the present day status. Paleomagnetism,

[continuation of TI-CHIH K'O-HSUEH No 2, Apr 78 pp 163-173]

mostly been transformed into calcite or low Mg-calcite, but the same minerals in the Recent beachrocks have not been changed. This change (neomorphism) is due to the effect of meteoric freshwater on the exposed beachrocks. The term "marine-freshwater diagenetic limestone" or "marine-epidiagenetic limestone" is proposed for these carbonate sediments which were deposited in the marine environment and lithified by the action of meteoric water.

The study of beachrocks indicates that the annual average temperature during the deposition of Middle-Late Holocene beachrocks was 2-4°C higher than that of the present, and the sea level then was 3-5 meters higher than that of today. Since then the northeast coast of Hainan Island has been considerably uplifted, whereas its southwest corner has slightly subsided.

AUTHOR: HSU Chieh [1776 2638]  
CHIANG P'u [5592 3302]  
SUNG Fang-min [1345 2455 2404]  
YANG Chu-an [2799 0031 1869]  
HSU Hao-min [1776 1170 3046]

ORG: None

TITLE: "A Preliminary Study of Seismo-Geological Characteristics in Horinger Region"

SOURCE: Peking TI-CHIH K'O-HSUEH [SCIENTIA GEOLOGICA SINICA] in Chinese No 2, Apr 78 pp 174-182

TEXT OF ENGLISH ABSTRACT: On 6 June 1976, an earthquake of magnitude 6.3 occurred in Horinger hsien, Inner Mongolian Autonomous Region of China (40°14'N, 112°12'E), located in the piedmont tectonic zone of Yin-shan-Yen-shan (mountains) in the northern part of the North China faulted block. The seismicity as observed recently in this tectonic zone has clearly become more and more intensive. The earthquake area falls in an intersection of NE-trending Hsin-tien-tzu-Liang-ch'eng fault belt and NW-trending Hei-lao-yao-She-hu-k'ou fault belt with NNE-trending Chiu-ts'ai-chuang-Hao-lai-kou foundational fault. The intensive neotectonic activity in this area resulted from the superimposed effect of NW trending newly formed uprising and the differential movement of the NE running fault. Besides, the

[continuation of TI-CHIH K'O-HSUEH No 2, Apr 78 pp 174-182]

area studied is also characterized by distinctive differential motion of faulted block. Within the recent compressive stress field with NEE strike, the "locking" of tectonic intersection leads to rapid stress accumulation on the NNE-trending foundational fault and shearing fracture resulting in the occurrence of the earthquake under investigation.

AUTHOR: None

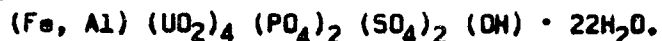
ORG: Hunan Institute No 230; X-ray Laboratory, Wuhan Geologic College

TITLE: "Xiangjiangite--A New Uranium Mineral Discovered in China"

SOURCE: Peking TI-CHIH K'O-HSUEH [SCIENTIA GEOLOGICA SINICA] in Chinese No 2, Apr 78 pp 183-188

TEXT OF ENGLISH ABSTRACT: Xiangjiangite, named after the Hsiang River, occurs in the oxidized zone of a Permian uranium deposit as powdery microcrystalline aggregates: yellow to bright yellow with silky luster, hardness 1-2, specific gravity 2.9-3.1; readily dissolved in diluted HCl and H<sub>2</sub>SO<sub>4</sub>. It is nonfluorescent in short wave ultraviolet light.

Under the microscope it appears light yellow, with Ng=1.593, Nm=1.576, Np=1.558, high interference color, biaxial (-), parallel as well as symmetrical extinction. Chemical analyses give UO<sub>2</sub> - 56.24, Al<sub>2</sub>O<sub>3</sub> - 0.90, Fe<sub>2</sub>O<sub>3</sub> - 2.04, CaO - 0.26, P<sub>2</sub>O<sub>5</sub> - 8.15, SO<sub>3</sub> - 5.65, H<sub>2</sub>O<sup>+</sup> - 9.86, H<sub>2</sub>O<sup>-</sup> - 10.70, SiO<sub>2</sub> (quartz) - 4.42, As<sub>2</sub>O<sub>3</sub> - 0.13 and in pyrite Fe - 0.15, S - 0.20, insol. - 0.46, total 99.16. The idealized formula is:



[continuation of TI-CHIH K' O-HSUEH No 2, Apr 78 pp 183-188]

The strongest X-ray power lines are 11.11(10), 5.58(8), 3.743(8), 3.313(8), 2.96(7), 4.621(6), 4.119(6), 2.179(5), 2.063(5). As determined by indexed powder data, optical data, electron diffraction patterns and by observing SED patterns of the fine crystal form with an electron microscope, this mineral belongs to the pseudo-tetragonal system with  $a \approx b 7.17\text{\AA}$ ,  $c = 22.22\text{\AA}$ ,  $a/c = 3.10$ .

The infrared absorption spectrum of the mineral studied includes five strong absorption bands at  $264\text{ cm}^{-1}$ ,  $923\text{ cm}^{-1}$ ,  $1044\text{ cm}^{-1}$ ,  $1617\text{ cm}^{-1}$ ,  $3390\text{ cm}^{-1}$  and three medium to strong absorption bands at  $468\text{ cm}^{-1}$ ,  $534\text{ cm}^{-1}$ ,  $613\text{ cm}^{-1}$ .

Differential thermal analysis study of Xiangjiangite shows four large endothermic peaks at  $95^\circ\text{C}$ ,  $174^\circ\text{C}$ ,  $330^\circ\text{C}$  on the DTA curve. There is a distinct weight loss on the DTG curve corresponding to the removal of  $\text{H}_2\text{O}$ . In addition, an endothermic effect near  $754^\circ\text{C}$  on the DAT curve may be related to the loss of  $\text{SO}_2$  and a smaller exothermic peak was observed near  $990^\circ\text{C}$ .

AUTHOR: CH'EN Yu-ming [7115 0645 2494]  
WANG Hsiu-lan [3769 4423 5695]

ORG: None

TITLE: "The Determination of the Magnesium Content of Calcium-Magnesium Carbonate Minerals Using a Small Diameter X-ray Powder Camera"

SOURCE: Peking TI-CHIH K' O-HSUEH [SCIENTIA GEOLOGICA SINICA] in Chinese No 2, Apr 78 pp 189-193

TEXT OF ENGLISH ABSTRACT: The mole % of  $\text{MgCO}_3$  in calcite-dolomite series can be determined with a small diameter (57.3 mm) X-ray powder camera, using the semiconductor grade silicon as an internal standard. The error in the determination of mole % of  $\text{MgCO}_3$  can be estimated within the limits of  $\pm 2.5$  mole %. The two regression equations are as follows:

$$1. \text{MgCO}_3 \text{ mole \%} = 952.88 (1.440 - d_{(030)}) + 1.94$$

$$2. \text{MgCO}_3 \text{ mole \%} = 25.2 \times \Delta\theta_{\text{FeK}\alpha} - 152.59,$$

where the  $\Delta\theta_{\text{FeK}\alpha} = \theta_{\text{FeK}\alpha} \text{ Carbonate (030)} - \theta_{\text{FeK}\alpha} \text{ Si(311)}$ .

8650

CSO: 4009

JOURNAL OF CHANGCHUN GEOLOGICAL INSTITUTE

AUTHOR: LIU Kuo-ch'ang [0491 0948 2490]

ORG: None

TITLE: "Mechanical Interpretation of T'ang-shan Earthquake and Explanation of Earthquake Effect"

SOURCE: Chang-chun CH'ANG-CH'UN TI-CHIH HSUEH-YUAN HSUEH-PAO [JOURNAL OF CHANGCHUN GEOLOGICAL INSTITUTE] [QUARTERLY] in Chinese No 1, 1978 pp 1-8

ABSTRACT: The 7.8 magnitude earthquake in T'ang-shan on 28 July 1976 had a depth of 12 km. On the same day, another earthquake of 7.1 magnitude followed in Wan-luan County; the depth of origin was unknown. In June 1977, the authors spent two weeks surveying the areas. The earthquake phenomena, especially the ground fractures had not been preserved completely and not much was directly observed. The authors had to rely upon previous survey reports for the consideration of many problems. The tectonic background and lithological foundation are discussed with a description of the fractures and the epicenter. For the purpose of evaluating the problem of regional stability, the structural stress field and the earthquake effects are reviewed. It is the opinion of the authors that due to the fact that the large quantity of heat energy cannot be dispersed quickly, the underground rocks are in a plastic state and stress cannot become concentrated immediately. The possibility of

[continuation of CH'ANG-CH'UN TI-CHIH HSUEH-YUAN HSUEH-PAO No 1, 1978 pp 1-8]

another severe earthquake is not very great. As the broken rocks are in the process of rearrangement to reach a new equilibrium, minor earthquakes may occur, however. Since it is difficult for the ground stress to concentrate in the original area, it must move to a different area to concentrate. The authors surmise that with the T'ang-shan earthquake, being the tensile torque plane of the Ho-hsi system, the T'ao-yuan fault has become active and will continue to be active for sometime. Earthquake may occur in its northern end and the EW direction structural complex area. The magnitude of that earthquake may possibly be rather high.



AUTHOR: P'AN Tso-shu [3382 0155 2873]  
MU Shih-min [4476 4258 2404]  
LI Shih-hua [2621 0013 5478]

ORG: None

TITLE: "Eight Position Conversion Method of  $Za_{\downarrow}$  and  $\Delta g_m$  "

SOURCE: Chang-chun CH'ANG-CH'UN TI-CHIH HSUEH-YUAN HSUEH-PAO [JOURNAL OF CHANGCHUN GEOLOGICAL INSTITUTE] [QUARTERLY] in Chinese No 1, 1978 pp 9-25

ABSTRACT: This paper discusses the eight-position conversion computation of  $Za_{\downarrow}$  and  $\Delta g_m$ .  $Za_{\downarrow}$  is vertical magnetic anomaly under vertical magnetization;  $\Delta g_m$  is gravity anomaly of magnetic origin. Among the conversion methods of common application, there are the two types of frequency and space realms; the method proposed here is one of the latter. Following a discussion of the theory and the eight-position operators, conversion results of a spherical model and of an actual anomaly are presented to test the reliability and precision of this method. It is the conclusion of the authors that the method can basically satisfy the needs of geological interpretation of anomalies. The error is greater for the northern side than the southern side, however; the farther from the center, the greater is the error. When the results of conversion are applied, therefore, attention should be given to using the central area of the anomaly, as much as possible. With this method, computation may be carried out on a large or a portable computer to cause it to be suitable for field application.

AUTHOR: HUANG Hsun-te [7806 5651 1795]

ORG: None

TITLE: "Characteristics of the Primary Geochemical Anomalies of III Mineral Zone of a Certain Copper Bed in Heilungkiang"

SOURCE: Chang-chun CH'ANG-CH'UN TI-CHIH HSUEH-YUAN HSUEH-PAO [JOURNAL OF CHANGCHUN GEOLOGICAL INSTITUTE] [QUARTERLY] in Chinese No 1, 1978 pp 26-41

ABSTRACT: The distribution characteristics of elements and characteristics of primary anomalies, and variations of contents of elements in the zone of anomalies and problems of anomaly formation are studied. Compared with ordinary neutral magmatic rocks, the mineral-forming parent rocks of the To-pao-shan deposit are rich in Mo, Pb, and poor in Ni, Mn, and the content of  $Na_2O$  is especially low. Metamorphism of rocks underwent the two stages of K-Na to Si and K-Si, and aside from  $K_2O$ ,  $Na_2O$ ,  $SiO_2$ , a small amount of Cu and Ag was added. In view of the Cu, Ag, Mn anomaly of the major mineralization stage, the formation was under the condition of rich  $SiO_2$ , poor CaO, containing  $K_2O$ , and lacking  $Na_2O$ ; therefore, using the  $K_2O$  content to delineate the zone of deposit should be entirely reasonable.

AUTHOR: FENG Fen-chih [7458 2609 2535]  
CHU Kuo-lin [2612 0948 2651]

ORG: None

TITLE: "Characteristics of a Certain Porphyry Molybdenum Deposit"

SOURCE: Chang-chun CH'ANG-CH'UN TI-CHIH HSUEH-YUAN HSUEH-PAO [JOURNAL OF  
CHANGCHUN GEOLOGICAL INSTITUTE] [QUARTERLY] in Chinese No 1, 1978 pp 42-51

ABSTRACT: A certain porphyry molybdenum is distributed in the northern wing of a certain synclorium in the eastern section of the complex east-west structural zone of Ch'in-ling Mountains. In the region, the overlapping structural bodies of many stages have a controlling action on magma activity and the formation of metal deposits. Following an analysis of the granite porphyry on the east side and a nearby acid intrusive body and a study of the metamorphism of adjoining rocks, the authors conclude that the molybdenum deposit is related to the granite porphyry in formation, and the mineral-containing rock body belongs to a shallow intrusion, controlled by the east-west and the new Sinian systems.

AUTHOR: LIU Yu-hai [0491 3768 3189]

ORG: None

TITLE: "Geological Evaluation and Selection of Site Earthquake Resistant Engineering"

SOURCE: Chang-chun CH'ANG-CH'UN TI-CHIH HSUEH-YUAN HSUEH-PAO [JOURNAL OF  
CHANGCHUN GEOLOGICAL INSTITUTE] [QUARTERLY] in Chinese No 1, 1978 pp 52-65

ABSTRACT: In view of the fact that a series of problems relating to engineering geology are urgently in need of resolution before various large engineering projects are planned and implemented in regions of earthquake danger, the author attempts to discuss in the paper the various geological factors affecting earthquake damage to engineering structures, the major contents and methods of geological survey for earthquake-resistant engineering, and the problems of evaluation of geological characteristics of faults and the earthquake-resistant characteristics of the foundation rock of the engineering site. Finally, the principle of earthquake resistance with respect to the selection of construction sites is analyzed.

AUTHOR: CH'ANG Ch'iu-sheng [1728 4428 3932]  
TSOU Tsu-jung [6760 4371 2837]  
CHU Kuo-lin [2612 0948 2651]

ORG: None

TITLE: "Discussion of Isotope Geological Age of the Northern Slope of East Ch'in-ling Mountains"

SOURCE: Chang-chun CH'ANG-CH'UN TI-CHIH HSUEH-YUAN HSUEH-PAO [JOURNAL OF CHANGCHUN GEOLOGICAL INSTITUTE] [QUARTERLY] in Chinese No 1, 1978 pp 66-89

ABSTRACT: This paper collects 183 data of isotope geological age, which were either published since 1958 or previously unpublished, using either the potassium argon method or the uranium lead method. Of these, 43 data were supplied by the Isotope Laboratory of Chang-chun College of Geology. A map of the region designating the distribution of isotope geological ages is included.

AUTHOR: HOU Te-i [0186 1795 5030]  
CH'EN Ch'i [7115 3823]  
WANG To-lun [3076 1122 0243]

ORG: None

TITLE: "The Nature of Mineral Prospecting Work"

SOURCE: Chang-chun CH'ANG-CH'UN TI-CHIH HSUEH-YUAN HSUEH-PAO [JOURNAL OF CHANGCHUN GEOLOGICAL INSTITUTE] [QUARTERLY] in Chinese No 1, 1978 pp 90-92

ABSTRACT: Mineral prospecting work employs theories of geology, uses geological observation as the basis of study, and adopts the most effective techniques to serve the national economy and construction directly. It is a work of the basic nature and is a constituent part of development of mineral resources. Physical prospecting and chemical prospecting are faster and more economical techniques and can improve the quality of the results of geological prospecting; they should be closely coordinated with one another. The various techniques should be highly specialized, as well as closely coordinated. Any contradiction of results remains an internal contradiction of mineral prospecting work. The basic policy is to improve continuously the level of geological science and technology and not to overemphasize the importance of a given specialty. From many aspects of the problem of mineral prospecting, the paper argues for the above position.

AUTHOR: YANG Ping-chung [2799 0014 0022]

ORG: None

TITLE: "Discovery of Oil Seepage in the Sinian Strata of the Yen-shan Region"

SOURCE: Chang-chun CH'ANG-CH'UN TI-CHIH HSUEH-YUAN HSUEH-PAO [JOURNAL OF  
CHANGCHUN GEOLOGICAL INSTITUTE] [QUARTERLY] in Chinese No 1, 1978 pp 93-94

ABSTRACT: In 1972, the author and colleagues discovered oil seepage in the thin limestone crevasses of the T'ieh-ling Formation of the Sinian Period of the northern part of Hopei Province. This year, they again discovered a large quantity of oil seepage in the strata of the Wu-mi-shan Formation of the Sinian Period in the nuclear part of the anticline of that region. The phenomena of the oil production, its geo-tectonic background, and the problems relating to the origin of the crude oil are studied.

AUTHOR: CHANG Shu-yeh [1728 2885 2814]  
CH'ANG Li-hua [1603 7787 5478]  
WANG Hsiu-mei [3769 4423 2734]

ORG: None

TITLE: "Structure of Magmatic Rocks: (Second Lecture)"

SOURCE: Chang-chun CH'ANG-CH'UN TI-CHIH HSUEH-YUAN HSUEH-PAO [JOURNAL OF  
CHANGCHUN GEOLOGICAL INSTITUTE] [QUARTERLY] in Chinese No 1, 1978 pp 95-101

ABSTRACT: In this installment, the following topics are discussed: (2) Exsolution structure; (3) Solid solution body structure; (4) Decomposition structure; (5) Melting structure; (6) Growth reaction structure; (7) Metasomatic structure. There is no indication that this lecture is to be continued further.

6168

CSO: 4009

ACTA GEOPHYSICA SINICA

AUTHOR: SHAO Hsueh-chung [6730 1331 6945]  
CHANG Chia-ju [1728 1367 5423]  
YANG Hsiao-feng [2799 1420 1496]  
CHANG Hsiao-hu [1728 2556 5706]  
LEI Sheng-li [7191 0524 0448]  
WANG Ch'i-ming [3769 0796 7686]  
KAO Wei-an [7559 4850 1344]

ORG: All of the Institute of Geology, National Seismological Bureau

TITLE: "An Experimental Study of the Structure of the Earth's Crust and Upper Mantle By Converted Waves"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 21 No 2, Apr 78 pp 89-100

TEXT OF ENGLISH ABSTRACT: When P waves from distant earthquakes meet a velocity discontinuity in the earth's crust and upper mantle, they give rise to a series of converted PS waves besides PP refracted waves. The difference of arrival times between such PS and PP waves can be used to determine the structures in the earth's crust and upper mantle.

[continuation of TI-CH'IU WU-LI HSUEH-PAO Vol 21 No 2, Apr 78 pp 89-100]

For the first time, the method of converted waves from distant earthquakes has been tried in the Hsia-chin-Kao-t'ang region of western Shantung province and in the Ch'ang-p'ing area west of Peking.

Polarization filtering was employed to analyze the seismic data in order to increase the reliability in identifying the PS phases. As a result, the crustal structures in these two regions have been found, and it is indicated that the main deep discontinuities thus obtained are essentially the same as those determined by deep seismic sounding experiments using explosions.

AUTHOR: LI Ch'uan-lin [2621 0356 2651]  
YU Lu [0060 8692]  
CH'EN Chin-piao [7115 6930 2871]  
HAO Pai-lin [6787 2672 2651]

ORG: LI and CH'EN of the Institute of Geophysics, National Seismological Bureau;  
YU and HAO of the Institute of Physics, Chinese Academy of Sciences

TITLE: "Time and Space Scanning of the b-Value--A Method for Monitoring the  
Development of Catastrophic Earthquakes"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 21  
No 2, Apr 78 pp 101-125

TEXT OF ENGLISH ABSTRACT: Statistical analysis of the b-value in the frequency-  
magnitude relation  $N = \exp(A-bM)$  was performed for several years before the T'ang-  
shan earthquake on 28 July 1976 ( $M_s = 7.8$ ) and before some other catastrophic  
earthquakes. It was shown that objective and statistically significant b-values  
could always be obtained provided seismic data was treated correctly and statistical  
methods used properly. On the basis of a phenomenological discussion of the  
frequency-magnitude relation in the view of Mogi and Scholz, it was concluded that  
the b-value is not only a parameter in statistical analysis, but also has its own  
physical meaning. It reflects the average stress being applied to the region

[continuation of TI-CH'IU WU-LI HSUEH-PAO Vol 21 No 2, Apr 78 pp 101-125]

considered and the extent of approach to its strength limits. Therefore, dynamic  
scanning of b-values in time and space goes beyond the scope of simple statistical  
prediction and becomes a method of monitoring the concentration and migration  
process of stress and monitoring the development of catastrophic earthquakes.

A direct procedure for non-linear least-square fitting to the exponential frequency-  
magnitude distribution was suggested in this work. This is an effective method for  
estimation which gives more exact limits for statistical errors.

AUTHOR: MA Hung-ch'ing [7456 7703 1987]

ORG: Institute of Geophysics, National Seismological Bureau

TITLE: "Variations of the b-Values Before Several Large Earthquakes Occurred in North China"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 21 No 2, Apr 78 pp 126-141

TEXT OF ENGLISH ABSTRACT: Studies concerning the variation of the b-values within smaller and larger areas surrounding epicenters before several strong earthquakes occurred in North China have been made. It was found that for smaller areas around the epicenters the b-values vary with time from higher to lower values until the outburst of the earthquakes, while for larger areas peak values of b appear immediately before the earthquakes. The time duration of the peak values seems to be related to the magnitudes of the large earthquakes.

In addition it was found that as the areas involved in the computation of the b-values become enlarged, the values of b tend to increase, and in the vicinity of the epicenters there exist areas of low b-values, while outside it are areas of high b-values. This pattern of the variation of the b-values conforms with the spatial distribution of the seismic activity before the strong earthquakes.

AUTHOR: CH'EN Yung [7115 9581]

ORG: Institute of Geophysics, National Seismological Bureau

TITLE: "Consistency of Focal Mechanism as a New Parameter in Describing Seismic Activity"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 21 No 2, Apr 78 pp 142-159

TEXT OF ENGLISH ABSTRACT: From the point of view of focal mechanism, characteristics of foreshocks, aftershocks and earthquake swarms are analyzed, based on observations of some of the strong earthquakes occurring in recent years. It is pointed out that there are considerable differences between the three. A "Group Parameter" or consistency of the focal mechanism has been suggested to describe the seismicity of a group of earthquakes and we try to make it more or less quantitative. It is emphasized that to identify the consistency of focal mechanism for a group of earthquakes, one may find it quick and convenient to just analyze the wave form of the seismic records. In addition, some examples are given in this paper for the assessment of earthquake risk by using the parameter mentioned above.

AUTHOR: TSENG Jung-sheng [2582 5816 3932]  
SHIH Chieh-shan [1597 3381 3790]

ORG: TSENG of the Institute of Geophysics, National Seismological Bureau; SHIH of the Seismological Bureau of Yunnan Province

TITLE: "Source Multiplicity of the Main Shock of the Yung Shan-ta Kuan Yunnan Earthquake of 10 May 1974"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 21 No 2, Apr 78 pp 160-173

TEXT OF ENGLISH ABSTRACT: A detailed analysis of the seismic record of the main shock of the Yung Shan-ta Kuan earthquake of 10 May 1974 from different epicentral distances has shown that the source of this earthquake was characterized by a complex multiple shock series. The seismic events from more than 10 shock points can be identified. Among these, the focal parameters of seven shock points were determined.

In the first two or three seconds, only a few minor shocks with energy not exceeding that of magnitude 5 occurred. Following that, four shocks with greater energy nearly equal to magnitude 7 occurred at a time interval of about 60 seconds.

[continuation of TI-CH'IU WU-LI HSUEH-PAO Vol 21 No 2, Apr 78 pp 160-173]

All shocks were distributed irregularly within a region with a linear dimension of 60 km. The sequence suggested a random occurrence of shocks in a weakening zone, rather than a fracture propagating regularly from one end of a fault to the other.



AUTHOR: HUANG Hung-tse [7806 3163 3419]

ORG: None

TITLE: "A Model Experiment of Detecting Faults By the Refraction Method--Certain Features on the Seismograms"

SOURCE: Peking TI-CH'IU WU-LI HSUEH-PAO [ACTA GEOPHYSICA SINICA] in Chinese Vol 21 No 2, Apr 78 pp 174-181

TEXT OF ENGLISH ABSTRACT: In the detection of faults by the refraction method, not only the ordinary refracted waves from the downthrow and upthrow sides of a fault and the diffracted waves from the fault plane are observed, but also certain secondary waves resulting from diffraction and transmission can be recorded on the seismograms. The whole set of waves constitutes a very complicated picture of the seismograms. If their kinematic and dynamic characteristics are not capable of being recognized and distinguished, it would be very hard to interpret the results of fault detection by the refraction method. In most of the previous literature, only the diffraction phenomena on the edge of a plate have been discussed, while the secondary waves by diffraction and refraction appearing possibly on seismographic records when both the upthrow and downthrow sides of the fault are present have been neglected.

[continuation of TI-CH'IU WU-LI HSUEH-PAO Vol 21 No 2, Apr 78 pp 174-181]

In this paper, the results of a model experiment using ultrasonic impulses are described and studies made in connection with the detection of faults by the refraction method of different throw magnitudes, the recorded anomalous refracted waves and secondary waves.

8650

CSO: 4009

SCIENCE PICTORIAL

AUTHOR: Unknown

ORG: Staff of Science Pictorial

TITLE: Photographs from front cover and inside front cover

SOURCE: Shanghai K'O-PSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2 Feb 78  
front cover and inside front cover

ABSTRACT: Front cover depicts research technicians of the Shanghai Metallurgical Research Institute studying a large-scale high speed integrated circuit.

Inside the front cover depicts the rapid developments in the electronics industry. At the upper left is a congratulatory message to the electronics industry from Chairman Hua. At lower left (top) a patient being treated for a tumor with a rectilinear accelerator and (bottom) a technician observing treatment by TV. At top right is a photograph of the use of photoelectricity in a Shanghai steel mill, at mid upper right a technician is receiving weather information from a satellite over the dish antenna in the inset, at mid lower right clerks in a meat market use electronic scales which automatically weigh and determine price, and at bottom right an electronic camera-timer developed by the Chinese is being used in a track race.

AUTHORS: SU Pu-ch'ing [5685 2975 7230]  
LU Ho-fu [4151 7729 7833]  
T'ANG Ao-ch'ing [0781 2407 1987]

ORG: Unknown

TITLE: "Scientists Talk about Six Basic Sciences"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2, Feb 78 pp 1-3

ABSTRACT: These 3 talks are the first half of the article. SU discusses the application of mathematical theory to the trend towards quantification in the sciences. LU discusses the development of particle physics and its implications for nuclear power and understanding the evolution of the universe. T'ANG discusses the application of the principles of quantum mechanics to the study of chemical structure, chemical bonds and chemical reactions and its implications for biochemistry.

AUTHORS: TAI Wen-sai [2071 2429 6357]  
LI Ch'un-fen [2621 2504 5358]  
T'AN Chia-chen [6151 1367 4394]

ORG: Unknown

TITLE: "Scientists Talk about Six Basic Sciences"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2, Feb  
78 pp 3-5, 41

ABSTRACT: These 3 talks are the last half of the article. TAI discusses recent developments in astronomical instruments which permit the study of the universe outside the earth's atmosphere and the importance of extraterrestrial phenomena for basic theory and our understanding of the earth. LI discusses the development of the earth sciences and their realms and the activities of Chinese earth scientists. T'AN discusses the relationship between biology and civilization and the development and implications of genetic engineering for food production and medicine.

AUTHOR: T'AN Hsiang-po [6151 4382 2672]

ORG: Unknown

TITLE: "Robots and Artificial Intelligence"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2, Feb  
78 pp 6-7

ABSTRACT: This article describes the developments in creating robots and artificial intelligence. The author discusses the way sensing devices are used to enable a mechanical "monkey" to locate and secure a bunch of bananas suspended out of its reach, the use and programming of computers to gamble and play checkers, chess and go and the use of computers as mechanical chemists to synthesize vitamins and to conduct searches for synthetic methods and procedures. Finally, the author describes work on creating artificial intelligence for the study of human senses, language and thinking and its implications for philosophy.

AUTHOR: CH'UNG Chiu [6850 0036]

ORG: Unknown

TITLE: "Earth Stations for Satellite Communications"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2, Feb 78 p 16

ABSTRACT: China recently completed its first satellite earth station. The global communications satellite system permits international communications and television broadcasting. This article describes the types of satellite orbits and the way in which signals are relayed from satellite to ground stations as well as the way in which two ground stations can communicate with each other by relaying signals through the satellite. The article also discusses the 2 major mediums of communication by satellite (modulation and numbers) and their relative merits.

AUTHOR: WANG Ming-ch'ang [3769 2494 1603]

ORG: Unknown

TITLE: "Manmade Satellites Around the Earth"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2, Feb 78 p 17 and inside back cover

ABSTRACT: Since the first manmade satellite was sent up in 1957 many satellites have been put into orbit. This article describes the functions of these satellites. The satellite functions described are: geodesic satellites used for mapping the earth; earth resources satellites for mineral exploration and photographing farms to estimate crop yield and to detect diseases and forest fires; communications satellites for relaying telephone calls, television broadcasts and for navigational aids; weather satellites for weather forecasting; scientific research satellites for research in astronomy and high energy physics; military satellites for intelligence purposes. Inside the back cover are illustrated a geodesic satellite, scientific research satellite, navigation satellite, military satellite, communications satellites, earth resources satellite and weather satellites.

AUTHOR: WEI Hsi [7614 33-5]

ORG: Unknown

TITLE: "Electronic Computers and the Modernization of Scientific Technology"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2, Feb 78 pp 8-11

ABSTRACT: The invention of the electronic computer has become a crucial part of modernizing scientific technology because computers are very fast, have large storage capacities, can make logical judgements and highly accurate calculations, can operate automatically and can be self-correcting. Computers can operate as simulation laboratories handling testing which is either very expensive or time-consuming. Because of their large memories and rapid operations they can help design new synthetics and serve as bibliographic storage or reference sources. Computers can be used to help design engineers by providing instant analysis, storage and drawing of the final design. Their ability at image recognition is currently being used to sort letters by postal code. Computers are used in automating industrial processes and are beginning to be used in the home. They can save in heavy, complex and tedious labor and can also serve as an extension of thought.

AUTHOR: HUANG Piao [7806 2871]

ORG: Unknown

TITLE: "Impulse and Transportation"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2, Feb 78 pp 11-12

ABSTRACT: The use of impulse air flow to transport such materials as sugar, milk powder, and cement is a new type of air transportation. The operational principle is simple. The material to be moved is placed in a transport tube separated by columns of compressed air so that as each column of air moves along so does each column of material. The mechanism consists of a pulse generator made up of a compressor and an air valve that opens and closes at fixed intervals, a feeder (either water-wheel type or double chamber type) and a column former. The system is useful for moving materials in suspension, but there can be friction problems at high speeds. Fragile materials that cannot ordinarily be transported by air pressure can be used in this system because the speed can be reduced. The system can be economical because it uses lower pressure and smaller diameter piping. Because there are few valves or gates the system can easily be automated.

AUTHOR: P'AN Ch'ang-kan [3382 2490 0051]

ORG: T'ung-chi University

TITLE: "Modern Oil Storage Technology--Cave Oil Reservoirs"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2, Feb 78 p 13

ABSTRACT: In underground oil storage, oil is stored in caverns dug into rock beneath the water table. Water pressure keeps the oil from seeping out through fissures in the rock. The site must be carefully chosen and the larger cracks filled with concrete. The oil level is controlled by the water level in the reservoir. One technique is a fixed water level with the water pumped in or out to maintain the level. This technique is suitable only for crude oil and low grade oil because of the danger of explosion. The other technique is a changing water level to keep the oil level close to the top of the reservoir. China's first underground oil reservoir was of this latter type. The underground storage system is cheaper than steel storage tanks or concrete tanks, costs less to maintain, and is safer.

AUTHORS: Unknown

NI Chien-kuo [0242 1696 0948]

CHOU Kuang-hai [0719 0342 3189]

WU Chih-hsiung [0702 1807 7160]

ORG: Unknown: Metal Casting Shop, Shanghai Forge

NI: Unknown

CHOU: Unknown

WU: Shanghai Plant 101

TITLE: "Technical Exchange"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2, Feb 78 pp 14-15

ABSTRACT: 1) The Metal Casting Shop describes an emery strip used in the machine which breaks up molding sand after casting, 2) NI describes a tool designed to split electric wire ends for use in electrical item assembly, 3) CHOU describes a type of drill bit designed for drilling "waist holes", 4) WU describes a mechanism to be attached to a grinding wheel for sharpening diamond points efficiently and cheaply.

AUTHOR: T'AN Hsiang-po [6151 4382 2672]

ORG: Unknown

TITLE: "Four Color Theorem Proved"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2, Feb 78 pp 20-21

ABSTRACT: For a long time map-makers have known that only 4 colors are needed for any map. This problem in topology has troubled mathematicians for many years. Stephen's coloring game demonstrated that only 4 colors are needed for any map. The 2-color theorem established that only 2 colors are needed on a surface divided by straight lines. The 7-color theorem as it applies to the torus is also discussed. In 1976 2 mathematicians at the University of Illinois proved the 4-color theorem using a high speed computer. The article briefly describes the procedure.

AUTHOR: WU Ch'i-k'uan [0702 0366 1401]

ORG: Unknown

TITLE: "Microwaves Have Come to the Green Fields"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2, Feb 78 pp 22-23,41

ABSTRACT: Microwaves have recently been employed in agriculture and their uses are growing. Microwaves can raise the temperature in soils, water, fertilizers, etc., by constant changes in electrical field. This is used to raise the temperature of seeds to accelerate germination and increase rate of germination. A new type of microwave weed killer can also kill unwanted grass, weeds, insects and fungi. Microwaves have also been tested for their ability to protect crops from snow and cold with some success. They are also used for drying grains and other crops, dehydrating vegetables and for measuring the water content of crops and fertilizers.

AUTHOR: CH'IN Kung [4440 6300]

ORG: Unknown

TITLE: "New Technology in Image Recording--The Television Record"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2, Feb 78 pp 32,48

ABSTRACT: The television record is similar to a phonograph record. It has considerable storage capacity, and can be used to store motion pictures, television programs, books, reference materials, etc. The records are glass plates with a thin metallic surface. The image is translated through a laser, cutting a groove in the plate. The groove runs in an outward expanding spiral. A 30 mm wide disc can record 40 minutes of television. The glass disc is the master from which plastic copies can be pressed. To play the record, the surface read by a laser beam in the playback unit and translated into a sound and color image. The records can be manufactured like phonograph records, but since there is no friction, they do not wear. The signal can be used with computers, cable or wireless transmissions. Because it is a flat disc rather than a tape, information can be accessed immediately without the need to search the tape. The playback unit has stop, fast forward, slow forward and reverse.

AUTHOR: CHOU Ching [0719 5464]

ORG: Unknown

TITLE: "Brief Scientific and Technical Notes"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2, Feb 78 pp 34-35

ABSTRACT: The following 10 items constitute the first half of this column. They are: 1) a horizontal drilling machine capable of drilling a hole 1.5 m in diameter and 50 m in length; 2) a contact-type two-sided adhesive fabric for gluing up printing plates of any material; 3) compound coating powders used for lubrication, insulation, rust inhibiting, etc.; 4) a thin type iron silicon alloy, 5) a type of printing ink that dries quickly under ultraviolet light; 6) a chemical gypsum board for construction of homes and furniture; 7) a pair of powerful multi-purpose pliers; 8) multi-layered printed circuits; 9) 3 kinds of underwater lamps (a diver's lamp, a pressure cabin lamp and a general purpose filming and rescue lamp); 10) assembly-type cleaning chamber for filtering air in industrial plants requiring climate and cleanliness control.



AUTHOR: CHOU Ching [0719 5464]

ORG: Unknown

TITLE: "Brief Scientific and Technical Notes"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2, Feb 78 pp 36-37

ABSTRACT: The following 8 items constitute the second half of this column. They are: 1) a transistorized whole body temperature lowering machine for medical procedures requiring lowering and/or raising body temperature; 2) equipment for treating angina pectoris and myocardial infarction; 3) development of low base glass and thin-walled bottles; 4) a poly an-chih [8637 7927] furniture finish; 5) a sensitized emulsion which is water resistant for use in making fabric printing plates; 6) the LJZ-10A single bridge combined rectifier element; 7) an infrared temperature sensor and control for regulating temperatures in industrial processes; 8) triangular and elliptical pencils to save on materials.

AUTHOR: UNKNOWN

ORG: Physical Therapy Department, Huatung Hospital, Shanghai  
Physical Therapy Department, Third People's Hospital, Second Medical School, Shanghai

TITLE: "Physics and Medicine"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2, Feb 78 pp 38-39

ABSTRACT: Physical therapy is the science of using physical factors (electricity, magnetism, microwaves, light, etc.) to prevent or treat disorders. This article discusses three types of physical therapy: electrotherapy, light therapy and sound therapy. Electrotherapy types covered are: direct current therapy for circulation problems, low frequency-low voltage impulse therapy for paralysis, audible frequency electric therapy, chien-tung [7035 0520] electrical current therapy for nerve problems, interference electric current therapy for internal disorders, and high frequency electrotherapy (long wave, medium wave, short wave, ultra short wave and microwave.) The types of light therapy are infra-red, and ultraviolet therapy. Sound therapy involves treatment using ultrasonic waves.

AUTHOR: YEN Yun [3601 0061]

ORG: Unknown

TITLE: "New Techniques in Genetic Engineering"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2,  
Feb 78 pp 40-41

ABSTRACT: Genetic engineering is a way of creating new types and varieties of life. One commonly used technique is to insert DNA sections into a receptor cell on a carrier. Some applications include developing organisms that can retrieve metals from wastes and sea water, can simplify and accelerate the production of antibiotics and can digest oil in petroleum spills at sea. Other applications in agriculture and animal husbandry include the development of a tobacco strain resistant to tobacco mosaic virus, and development of nitrogen fixing characteristics of some crops to eliminate or reduce the need for nitrogen fertilizers. Work is being done to cure some diseases, such as sickle cell anemia, and phenylketonuria, as well as developing bacteria that can produce important medicines such as insulin, by engineering in the insulin producing gene. The future holds promise for actually engineering life in accord with a blueprint of desirable characteristics.

8226

CSO: 4009

AUTHOR: CH'EN Chien [7115 1017]  
P'AN Hsiao-kao [3382 0876 4108]

ORG: None

TITLE: "DZL Circuit--KH-78 Type Six-Transistor Table Model Receiver-Amplifier"

SOURCE: Shanghai K'O-HSUEH HUA-PAO [SCIENCE PICTORIAL] in Chinese No 2,  
2 Feb 78 pp 46-47

ABSTRACT: In this concluding installment of the paper, the arrangement of remaining parts and the base board, adjustment and testing of the completed set, and methods of eliminating troubles are discussed. In the process of adjusting and testing, there may be problems of noises, distortion, low reception, poor low frequency response, A.C. hum, etc. The effect of this instrument is better if one 250 mm speaker is used, although two 165 mm speakers may also be used. Circuit diagrams are included.

6168

CSO: 4009

RADIO

AUTHOR: TING Kao-sheng [0002 4108 3932]

ORG: Hua-tung Bureau of Electric Power Management

TITLE: "Infrared--the Invisible Light"

SOURCE: Peking WU-HSIEN-TIEN [RADIO] in Chinese No 5, May 78 pp 2-4

ABSTRACT: This article presents a tutorial introduction to the nature of infrared radiation and its applications. Specifically, the following topics are discussed: 1) the frequency spectrum of infrared radiation and its propagation characteristics; 2) the close relations between infrared radiation and heat radiation; 3) the design and construction of various types of infrared detectors; 4) military and commercial applications of infrared technology which include: missile guidance, surveillance, night vision, radar and communication, remote temperature measurement, non-destructive inspection of materials, detection of forest fires, analysis of gases and pollution contents, monitoring agricultural development, and the use of infrared therapy and infrared detection of cancer in medicine.

AUTHOR: YEN Ch'ao [7346 6389]

ORG: None

TITLE: "Basic Types of Triggers Used in Integrated Circuits"

SOURCE: Peking WU-HSIEN-TIEN [RADIO] in Chinese No 5, May 78 pp 5-8

ABSTRACT: The operational principles of several basic types of triggers used in integrated circuits are described. They include: 1) the basic R S trigger, which consists of two logic gates (e.g., NAND gates) whose output and input terminals are coupled together; 2) the non-synchronous R S trigger, which consists of a basic R S trigger connected to two additional NAND gates; 3) the preferential set(S) trigger and the preferential reset(R) trigger, which are non-synchronous R S triggers with feed backs; 4) data triggers, which are used in data storage units, counters, and shifted storage units; 5) the J K trigger and the E trigger, each of which has two independent inputs; and 6) the tally trigger and the R S T tally trigger which has direct reset and set terminals.

AUTHOR: WANG K'ai-min [3769 7030 2494]

ORG: None

TITLE: "A Two Channel Television Antenna"

SOURCE: Peking WU-HSIEN-TIEN [RADIO] in Chinese No 5, May 78 pp 9-11 and 14

ABSTRACT: Currently, most out-door television antennas are single channel directional antennas consisting of either three or five fixed elements. This article introduces a two-channel antenna which is made of two three-element antennas coupled in such a way that a high-frequency channel and a low-frequency channel can be received. In particular, the basic principles of the three-element directional antenna and the two-channel antenna are explained. The procedures of designing and constructing a two-channel antenna corresponding to the broadcasting frequencies of local television stations are described in detail. In addition, the construction of a fringe area two-channel antenna with superior directional coefficient and higher gain is also discussed.

AUTHOR: None

ORG: Nanking Furniture Factory

TITLE: "The Nanking 704-A Black and White Television" (Part 2)

SOURCE: Peking WU-HSIEN-TIEN [RADIO] in Chinese No 5, May 78 pp 12-14

ABSTRACT: In this article, technical specifications of the major components of the Nanking 704-A black and white television are presented, which include: coils in the I.F. circuit, video frequency coils and current suppressing coils, power transformer, output transformer, and deflection coils. In addition, the following tuning procedures are described in detail: 1) rough tuning of the scanning section; 2) tuning of the pass band section; and 3) fine tuning of the scanning section.

AUTHOR: None

ORG: Peking Radio Factory

TITLE: "The Peony 2241 Wide Band Transistor Radio" (Part 4)

SOURCE: Peking WU-HSIEN-TIEN [RADIO] in Chinese No 5, May 78 pp 15-17 and 32

ABSTRACT: This article describes the basic operations of the power amplifier circuit, the audio circuit, the speaker system, and the power supply system of the Peony 2241 wide band transistor radio. Technical data of the following components are presented: 1) input coils in the amplitude modulation (A.M.) circuit; 2) high frequency amplification coils and oscillator coils in the A.M. circuit; 3) frequency modulation (F.M.) input coil; 4) F.M. high frequency amplification coil; 5) intermediate frequency (I.F.) trapping coil; 6) F.M. local oscillator coil; 7) I.F. transformer in the F.M. circuit; and 8) frequency discrimination transformer. In addition, the structure of the cabinet and the installation of the magnetic antennas are briefly described. ( article to be continued)

AUTHOR: None

ORG: Shanghai Radio No. 28 Factory

TITLE: "The Use Of Model 312 I.F. Transformer in an Electron Tube Radio"

SOURCE: Peking WU-HSIEN-TIEN [RADIO] in Chinese No 5, May 78 p 17

ABSTRACT: The model 312 I. F. transformer can be used in the I. F. amplification stage of the amplitude modulation (A.M.) section of an electron tube superheterodyne radio. In this article, the technical specifications and performance data of the four models of 312 transformer (i.e., 312-1, 312-2, 312-3, 312-4) are presented. The important parameters tabulated on the inside back cover of this issue include: the I.F. frequency, the amplification factor, the selectivity, the pass band width, the capacitance, the tunable frequency range, the turn number, the inductance, the Q value, the d.c. resistance, and the outside dimensions. It is pointed out that the tabulated data were measured under an equivalent input load of 560 kilo-ohms for models 312-1 and 312-3, and an equivalent output load of 300 kilo-ohms for models 312-2 and 312-4.

AUTHOR: None

ORG: Shih-chia-chuan District Broadcast Equipment Repair Factory

TITLE: "Experience in Repairing A.C. Radios" (Part 4)

SOURCE: Peking WU-HSIEN-TIEN [RADIO] in Chinese No 5, May 78 p 18

ABSTRACT: This article suggests simple methods of repairing several commonly encountered malfunctions in the I.F. amplification stage and the frequency conversion stage of an a.c. radio. These malfunctions are: 1) sound volume too low; 2) appearance of "steam-boat" sound; 3) shriek sound on both sides of a tuned station; 4) fluctuating sound level; 5) no reception or limited number of stations; and 6) excessive noise level.

AUTHOR: TI Po-ch'u [3695 3134 0443]

ORG: None

TITLE: "Methods of Testing Underground Cables"

SOURCE: Peking WU-HSIEN-TIEN [RADIO] No 5, May 78 pp 19-21

ABSTRACT: Testing underground cables is an important procedure in maintaining the quality of underground cables to ensure normal operation. In this article, methods are suggested for performing the following tests: 1) testing for open circuit; 2) testing for current leakage by measuring the insulator resistance; 3) measuring the closed circuit resistance; 4) measuring the circuit capacitance, inductance and impedance; 5) measuring the characteristic attenuation of the cable; and 6) selecting the load impedance and internal resistance of the oscillator in performing the tests.

AUTHOR: None

ORG: None

TITLE: "Illustrations of Front Cover And Back Cover"

SOURCE: Peking WU-HSIEN-TIEN [RADIO] in Chinese No 5, May 78  
pp front cover, inside front cover, back cover

ABSTRACT: The front cover shows the photograph of a female radio operator at her job. The inside front cover depicts the pictures of five new scientific developments: 1) the LT-1 mass spectral analyzer; 2) the receiving equipment for cloud maps from a synchronous weather satellite; 3) the optical fibres for laser communication; 4) a semi-automatic computer for interrogating and retrieving telephone numbers; and 5) the experimental set-up for studying the separation of isotopes using laser. The back cover shows the control panel of a transistor remote operation unit developed by the Ching-chiang County Radio Factory for petroleum refineries and oil pumping stations.

3012  
CSO: 4009

- END -

[continuation of TI-CHIH K'O-HSUEH No 2, Apr 78 pp 99-111]

which begins to enter into the remote geological past, is the first branch of true paleogeophysics, while other branches, lagging far behind, still await further progress.

Continental drift, sea floor spreading, plate tectonics, plate geology, geosematology: these mark the big steps of the present century geology in the long march toward a comprehensive understanding of our planet.

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TITLE: "Investigation On the Material Constitution of the Kirin Meteorite Shower and Discussion of Its Significance With Regard To the Study of the Origin and Evolution of the Earth"

SOURCE: Peking TI-CHIH K'O-HSUEH [SCIENTIA GEOLOGICA SINICA] in Chinese No 2, Apr 78 pp 113-133

TEXT OF ENGLISH ABSTRACT: This paper deals with the following: 1. the distribution and morphological characteristics of specimens collected from the Kirin meteorite shower on 8 March 1976, 2. the determinations by various techniques showing the Kirin meteorites to belong to the H-group chondrites and petrologically to chrysolite-bronzite chondrites, 3. the identification of orthopyroxene by the equation proposed on the basis of values of  $d_{420}$  and  $d_{610}$  from X-ray powder analysis, 4. comparison of the genesis of chondrule with that of casting stones, 5. the microstructure of the fusion crust of the meteorite, 6. the Mossbauer effect of minerals and the magnetic properties of the meteorite, 7. the degree of metamorphism and the evolutionary history of the meteorite in connection with absolute dating, 8. the coexisting relationship between orthopyroxenes and olivines, giving the linear equation of  $F_{\text{O}}$  versus  $F_{\text{M}}$ , applicable to ordinary chondrites, 9. the mutual



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relationship between the meteorite shower and the moon, the earth and the sun, and 10. the properties of chemical bonding of iron in meteorites and the evolutionary process of the iron under discussion, can be considered as a criterion for the study of stratified substances and the evolution of the earth.

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TITLE: "Discussion on Garnet in Kimberlite and Related Rocks"

SOURCE: Peking TI-CHIH K'O-HSUEH [SCIENTIA GEOLOGICA SINICA] in Chinese No 2, Apr 78 pp 134-148

TEXT OF ENGLISH ABSTRACT: This paper emphasizes the chemical composition and the origin of pyrope from kimberlite and related rocks. Among the 274 chemical analyses and related rocks cited here, 78 are supplied by the authors. They are calculated, grouped and compared.

The preliminary remarks may be given as follows:

1. There are two types of garnets in kimberlite. The first type is chrome-rich pyrope in ultramafic assemblage. For the content of  $Cr_2O_3$  the purple series generally is greater than 2.5%, orange series is  $> 0.3\%$ , while the values for garnets from the related rocks are usually lower. Furthermore, the calc-poor, chrome-rich and Fe-low or the calc-high, chrome-rich and Fe-low chrome-rich pyrope associated genetically with diamond may be regarded as ore guide. The second type

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is pyrope-almandine from eclogite assemblage, of which the composition is commonly hardly distinguishable from that of related rocks, although  $Mn/Fe^{2+} + Mn$  and  $Na_2O$  differ in content.

2. The chemical composition of pyrope from kimberlite shows some successive changes which allow us to infer the mineral studied is derived largely from kimberlitic magma and is polygenetic in nature.

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TITLE: "Genesis and Filling of Ore-forming Fractures and Their Pulsatory Nature"

SOURCE: Peking TI-CHIH K'O-HSUEH [SCIENTIA GEOLOGICA SINICA] in Chinese No 2, Apr 78 pp 149-162

TEXT OF ENGLISH ABSTRACT: Starting from the viewpoint of development, this paper divides the history of ore-forming fractures into three stages--the genetic stage, the gaping and filling stage and the destructive stage--and an analysis is made with examples of the two former stages related to ore-forming. The genetic stage of ore-forming fractures results principally from horizontal compressive stress, and deformation-fracturing process reflects in general the stereoscopic characteristics. The gaping and filling of ore-forming fractures is formed chiefly under conditions of structural tension, which is associated with the uneven uplift of an ore-forming region. Consequently, the ore-forming fracture system is motivated by compressive stress and completed by tensile stress.

Ore-forming fractures are closely related to veined ore-deposits, which indicates that both ore-forming structural activities and metallogenetic processes often take place many times intermittently; in other words, they are of a pulsatory

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nature. Two types of characteristic structural pulsation are recognized: 1. multiple genesis of ore-forming fractures and 2. multiple gaping and filling of ore-forming fractures in a single genesis.

Finally, the tectonic origin of the problems treated above and the significance of their application to practical work are also discussed.

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TITLE: "Holocene Beachrocks at Hainan Island"

SOURCE: Peking TI-CHIH K'O-HSUEH [SCIENTIA GEOLOGICA SINICA] in Chinese No 2, Apr 78 pp 163-173

TEXT OF ENGLISH ABSTRACT: Two types of beachrocks with different ages and lithology occur at the coast of Hainan Island. They consist of sands and gravels which were deposited and cemented in the intertidal and spray zones during the Recent and the Middle-Late Holocene respectively. Most of the Middle-Late Holocene beachrocks are subaerially exposed.

In this paper the geology, geomorphology and petrology of these beachrocks are described, while their origin and geological significance are also discussed.

The cements of these beachrocks are of three types: muddy and acicular aragonite, columnar high Mg-calcite and granular calcite mosaic. The aragonite and high Mg-calcite making up the skeletons within the Middle-Late Holocene beachrocks have