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SCIENCE AND TECHNOLOGY

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24 January 1984

CHINA REPORT

SCIENCE AND TECHNOLOGY

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APPLIED SCIENCES

NATIONAL METROLOGICAL MEETING OUTLINES GOALS

OW161406 Beijing XINHUA in English 1325 GMT 16 Dec 83

[Text] Beijing, 16 Dec (XINHUA)--A seven-year program to improve calibration of meters and instruments throughout China has been outlined by the national metrological meeting which closed in Beijing yesterday.

Tasks set forth by the State Bureau of Metrology include calibrating all meters and instruments in China's factories and mines, establishing calibration centers, popularizing international measurement standards and developing new national standards.

China will set up 100 technical service centers to calibrate local meters and instruments in big and medium-sized cities and help factories, mines and commercial units improve quality of products, reduce consumption of raw materials and improve management.

About 60 national measurement standards need to be set up, including those for large-scale integrated circuits and for flow of oil, gas and water.

Legal measurement units based on the metric system should be in use by the end of the 1980's. Government departments, educational institutions, scientific research institutes, and the news media will be required to limit use of the British measuring system or other nonmetric systems.

To date, more than 20,000 major industrial enterprises in China have set up metrological departments to oversee calibrating and measuring work.

The national meeting also discussed drafting a law on metrology.

CSO: 4010/25

APPLIED SCIENCES

RAPID DEVELOPMENT OF NUCLEIC ACID INDUSTRY URGED

Shanghai WEN HUI BAO in Chinese 4 May 83 p 1

[Article: "Speed Up the Development of China's Nucleic Acid Industry"]

[Text] "China has abundant resources for nucleic acid production, but the industry is developing slowly. We suggest that a strong nucleic acid research and production association be set up to develop key technical efforts." This suggestion was recently made by Wang Dachen [3769 2192 3819], deputy director of Laboratory No 7, Shanghai Organic Research Institute, Chinese Academy of Medicine and assistant researcher at the institute, and by assistant researcher Li Xiangpeng [2621 4382 7720].

Nucleic acids are the main material basis of biological heredity and are extremely important in vital activity. Study of nucleic acids not only is of great theoretical importance but also has great economic value. Wang Dachen and Li Xiangpeng stated that extremely tasty flavors created by the food industry from nucleic acids are 40 to 680 times as concentrated as ordinary monosodium glutamate [MSG]. Compound flavorings developed from nucleic acid can be used to give foods the flavor of pork, beef and chicken. Weak and old persons have decreased ability to manufacture nucleic acids; if nucleic acids are added to their food in suitable quantities, this can partially alleviate their physical decline. As a result, nucleic acids are called a "youth food." In the pharmaceutical industry, nucleic acid pharmaceuticals are new types of biochemicals which can be used to treat viral diseases, cardiovascular diseases and cancer. Nucleic acids are also important plant growth stimulators which can produce increased yields of paddy rice, soybeans, alfalfa and the like. DNA derivatives can become a new generation of nontoxic, highly effective agricultural chemicals.

Wang and Li stated that the scientifically developed countries are continually developing their nucleic acid industries. Japan's yearly output is more than 5,000 tons, while we produce only 20 tons. The main reasons that we are lagging behind are that our output of raw materials for nucleic acids is small, their price is high and there are difficulties in promoting their application; that we have not carried out the necessary development research; and that we lack a leadership organization capable of coordinating research and production.

They have concluded that for China to speed up the development of its nucleic acid industry, it must first include development of the industry among its key efforts and establish a nucleic acid research and production association subordinate to the State Biological Development Center. In addition, we must fully utilize our rich resources of nucleic acid raw materials, such as left-over molassas from the sugar industry, spent fermentation liquor from MSG plants, spent liquor from glucose plants and the like, and utilize the high nucleic acid output yeast strains developed by the Organic Institute, thereby turning waste into treasure. They suggest that after production of nucleic acid, the yeast can be used as a superior protein feed. In addition, we should vigorously develop new nucleic acid products, expand their range of applications and correct the current practice in China's nucleic acid industry of producing only a small number of pharmaceuticals such as ATP [adenosine triphosphate]. An additional urgent task is to begin adjusting the price of nucleic acid products as soon as possible, in order to motivate the producer plants.

8480

CSO: 4008/140

APPLIED SCIENCES

SCIENCE COMMISSION AWARDS 155 INVENTIONS

OW191838 Beijing XINHUA in English 1650 GMT 19 Dec 83

[Text] Beijing, 19 Dec (XINHUA)--Four Chinese inventions will be given the first-class national awards this year by the state science and technology commission.

This was decided at a ten-day meeting of the commission's recommendation and examination committee, which closed here today.

The inventions include a new rice strain developed by radioactive breeding techniques by the institute of atomic energy application of the Zhejiang Provincial Academy of Agricultural Sciences. The strain's growth period is 106 to 111 days, 40 days shorter than its parent. It yields from 6 tons to 10.28 tons per hectare, and has been grown on more than 800,000 hectares in the Yangtze River valley.

Also to be awarded a first prize is a vaccine for infectious equine anemia developed by the Harbin Veterinary Institute of the Chinese Academy of Agricultural Sciences. The vaccine is the first against the disease, which is epidemic in more than 40 countries. It has been tested on over 20 million horses, mules and donkeys in China.

Another top prize winner is a new vaccine against swine fever developed by the China Supervisory Institute of Veterinary Medicines. The medicine, which has a prevention rate of 100 percent, costs only one cent per pig. The vaccine has already been used in countries in Asia and Europe.

Two wilt-resistant varieties of cotton will also be given the first-class award. They are resistant to more than 90 percent of the more than 100 families of wilt bacteria.

Second-class awards will be given to 12 new inventions, while 80 more will be granted third prizes.

The Chinese Government has given awards to 642 inventions, 214 of which were appraised this year, since 1979.

CSO: 4010/31

APPLIED SCIENCES

ACADEMY, NEIGHBORHOOD PLANTS LAUNCH SCIENTIFIC, TECHNICAL COOPERATION

Shanghai WEN HUI BAO in Chinese 12 Jun 83 p 1

[Article: "Shanghai Academy of Sciences and Neighborhood Plants Launch Scientific Technical Cooperation"]

[Text] The Shanghai Academy of Sciences, which has nearly 3,000 engineers and advanced engineers, will engage in scientific and technical cooperation with neighborhood factories. This information came from recent technical cooperation talks between the academy and the city's Office of Collective Services.

The eight research institutes, subordinate to the Shanghai Academy of Sciences which are involved, have relatively vigorous technical capabilities, facilities and research tools. As a result of preliminary talks, neighborhood factories are interested in transfer production or joint production of Research Institute No 708's air-cushion jeep, Research Institute No 711's hydraulic coupler, Research Institute No 1050's microwave monitoring and control unit and Research Institute No 1932's switched power supply. The research institutes have said that in addition to transferring results, they are also willing to help train technical personnel, furnish technical consultations and provide equipment and measuring implements and the like.

8480

CSO: 4008/140

APPLIED SCIENCES

YOUNG COMPUTER PROGRAMMERS' ACHIEVEMENTS REPORTED

Shanghai WEN HUI BAO in Chinese 13 Jun 1983 p 2

[Article: "Youths Show Creativity in Computer Programming"]

[Text] A question-and-answer session on the self-selected topics entered in the country's first Youth Computer Programming Competition was held yesterday at the municipal Youth Computer Education Center. The 40-odd computer programs presented at the conference were praised by the more than 30 computer experts who attended.

In recent years many young computer enthusiasts have appeared in Shanghai. After a certain period of study they have written highly creative programs with application value. This software design work has involved supplementary instruction, economic management, public services, arts and physical education and the like. For example, the "Railway Search and Ticket Sales System," designed by Normal University No 2 High School student He Jianhua, allows travelers to find information on times, routes, ticket prices and seat or berth numbers for trains to their desired destinations. The hierarchical structure of the program is clear, the data structures are rational and it makes successful use of the very difficult document organization. The program "A Black Chart Method for Comprehensive Quality Management," designed by Nanyang Model High School student Yang Yongli, has been tested by the relevant units and has increased product quality inspection speed by about 90 times.

8480

CSO: 4008/140

APPLIED SCIENCES

SATELLITE SHOTS, GROUND SURVEYS PINPOINT NATION'S FIRST KNOWN METEORITE CRATER

Guangzhou NANFANG RIBAO in Chinese 19 Dec 83 p 1

[Article: "China's First Meteorite Crater Discovered in Shixing County; Satellite Photographs and Geological Surveys Make Verification"]

[Text] Recently, geological workers verified the discovery of China's first known meteorite crater in Shixing County, Guangdong Province. This reporter learned of the event at a meeting held in Guangzhou on 14 December.

The meteorite crater is located 45 kilometers southeast of Shaoguan City. It has a diameter of 3 kilometers and a depth of 250 meters. On the computer-enhanced color satellite photograph[s] could be seen the round shape of the crater and debris radiating outward from the center.

The study of the crater and the effects of its impact are the province of a new branch of science known as astrogeology. These studies actually involve the causes of global catastrophic events (such as the utter destruction of the dinosaurs during the late Cretaceous Period) as well as the astronomical causes of mineral formation, etc. As a result, much interest is shown in these areas in international geology circles.

China has traditionally been unable to find geological formations such as meteorite craters, so this new field is still in its infancy here. Today, the discovery of this crater represents the first complete geological structure to be found by the fledgling new field of astrogeology in China.

CSO: 4008/98

LIFE SCIENCES

APPROPRIATE DEVELOPMENT OF MEDICAL EDUCATION URGED

Shenyang LIAONING RIBAO in Chinese 7 July 83 p 3

[Article by Li Zhenzhi [2621 2182 1807], Wang Liye [3769 4539 2814], and Guan Yongchen [7070 3057 3819], China Medical University: "Medical Education Must be Suitably Developed"]

[Text] Since the founding of New China there has been great progress in public health in Liaoning Province. But we are still not meeting the economic and social needs of the province, particularly the requirements of the four modernizations since the Third Plenary Session of the 11th Central Committee.

1. The trained mainstay of the public health contingent is small, its quality is poor, and it is aging. According to 1981 statistics, there are about 38,000 doctors of Chinese and Western medicine in the province, accounting for only 23.1 percent of all trained public health personnel. The number of Chinese and western physicians per 1000 population is 2.04 in the cities, 21st among the provinces and municipalities, while in the countryside the figure is 0.56, 14th among the provinces and municipalities. Statistics from a survey of 4,523 attending physicians, chief physicians and assistant chief physicians indicate that 80 percent of the attending physicians are 45 years old or more, while 73.4 percent of the chief physicians and assistant chief physicians are 55 years old or more.
2. Public health personnel are unevenly distributed, and the proportionalities are out of balance. They are concentrated in the cities and poorly represented in the countryside. Statistics show that there are 21 times as many trained public health personnel in the cities as in the countryside, and among these personnel the proportions of advanced, intermediate and beginning-level personnel are irrational.
3. Medical education is not meeting the requirements of the situation. Existing medical colleges have limited training capabilities and cannot meet the requirement to expand the ranks of trained medical personnel. Even natural attrition cannot be made up; every year about 1,000 persons are not replaced.

To resolve these contradictions, we must find unused potential in existing advanced and intermediate medical schools and large medical units, use

various types, forms, approaches and methods of study, and expand student recruitment in order to meet our needs. In addition, the financial departments should provide investments to expand or construct buildings and add the necessary instructional facilities. In the older schools there is still untapped potential among the ranks of the instructional personnel. We should increase personnel mobility, make use of combined work and study and short-term positions, and organize personnel transfers and similar forms in order to activate the medical contingent.

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CSO: 4008/164

LIFE SCIENCES

FIRST NUCLEAR MEDICINE, ELECTRONICS CONFERENCE HELD

Beijing JIANKANG BAO in Chinese 24 April 83 p 1

[Article: "First National Nuclear Medicine and Electronics Conference Held"]

[Text] Scientists in the areas of research, production and utilization assembled to exchange information and ideas at the first National Nuclear Medicine and Electronics Conference, held in Beijing on 11-16 April. The conference participants concluded that this interdisciplinary conference was beneficial to the development of both fields.

Nuclear medicine is a field which combines nuclear technology and medicine and is one of the important characteristics of the modernization of medicine. In recent years, because of the increase in the variety of radioactive medicines and their steady improvement as an instrument for revealing organ functions, particularly the development of scintillation cameras and the broad introduction of computers in nuclear medicine, the field has already entered a new stage in the morphological, functional, dynamic and quantitative imaging of living organs. This has created more favorable conditions for the early diagnosis and treatment of disease.

Applications of nuclear medicine have already been disseminated to all provinces, municipalities and autonomous regions, with the exception of Xizang. The conference participants concluded that although current diagnostic methods include CT [computerized tomography], nuclear magnetic resonance and similar advanced techniques, because the methods of nuclear medicine can give a combined indication both of form and function and of function and metabolism, they cannot be replaced by any other diagnostic technology. Thus, this conference was sure to promote the development of nuclear medicine in China.

The conference was jointly run by the China Electronics Society, the China Nuclear Society and the China Medical Society.

8480

CSO: 4008/127

LIFE SCIENCES

PROGRESS IN NEUROSURGERY REPORTED

Beijing JIANKANG BAO in Chinese 29 May 83 p 3

[Article by You Housheng [1429 0624 3932): "China Makes Progress in Neurosurgery"]

[Text] The China Medical Society's Conference on Neurosurgery, which was recently held in Tianjin, was the first academic conference in China exclusively devoted to neurosurgery. It thoroughly reviewed the manpower and level of attainment of Chinese neurosurgery and reflected the unremitting effort which specialists in this field are making to reach world levels.

Before liberation, the scope of neurosurgery was very small; only a few persons were working in the field. In 1953, in response to an assignment from the Ministry of Public Health, Professor Zhao Yicheng [6392 0110 2052] of the Tianjin Medical Academy held the country's first course in neurosurgery, which was attended by only about 10 persons. Thirty years have now passed, and the 10-odd seeds have sprouted throughout the country, so that a contingent of respectable size and attainment in neurosurgery has taken shape, paving the way for us to catch up to the world state of the art in this field.

Chinese research on some topics in neurosurgery has already matched world standards. Since 1979, microsurgical techniques have been used in Shanghai for 63 excisions of arterial and venous abnormalities, with a success rate of 97 percent and a surgery death rate of only 1.58 percent. Tumor surgery in back of the third cerebral ventricle is very difficult and dangerous, with a high death rate. In recent years, painstaking research on this type of surgery has been conducted in Tianjin, among other locations, and in the PLA No 301 General Hospital. Correct selection of the surgical route of entry and continuous improvement in surgical techniques have yielded excellent results. In the course of 5 years, the Beijing Neurosurgical Research Institute has had no deaths in 23 such operations. We now have relatively mature experience in all types of brain tumor surgery in terms of routes of entry, surgical techniques, prevention of complications and determination of prognoses, and we are at or near the world state of the art in these areas.

The general use of microsurgery and the widespread application of modern techniques have promoted the development of this field. For example, in the treatment of ischemic cerebrovascular disease, since a case of the successful

joining of arteries inside and outside the skull was reported in Xinjiang in 1976, a total of 1,580 operations have been performed in China, placing us first in the world. There has been a marked decrease in the death rate resulting directly from surgery on tumors of intracranial arteries. Some 100 cases have been reported from Chongqing, including 57 under the surgical microscope, with only 1 death. The use of microsurgery has also allowed neurosurgeons to begin treating deep brain tumors, with a great improvement in operating results. At the conference, more than 300 cases of surgical removal of tumors of the hypophysis and auditory nerve were reported. Operations of this type have also been conducted in Beijing, Shanghai, Wuhan and Chongqing.

In response to the development of clinical technique, in recent years there has also been some progress in basic theoretical research.

Research carried out in Zhejiang, Jilin and Shanghai on estrogen receptors and glucocorticoid receptors of brain tumors and on alkali albumin of human gliomas and their immune RNA [ribonucleic acid] has marked China's entry into molecular-level brain tumor research. The use of evoked potentials to diagnose myelopathy is a recent worldwide advance. Some work has been done in this area in Shanghai and Beijing. The Beijing Neurosurgical Research Institute has performed research on eight markers of general cerebral function by computer analysis of encephalograms, obtaining objective diagnostic data for certain functional complaints.

Although the meeting pointed up recent developments in neurosurgery in China, we are still well below advanced world levels, and we must redouble our efforts to catch up in the future. In addition, many of our hospitals have not mastered the necessary neurosurgical techniques, and results and experience already obtained urgently need to be disseminated so that neurosurgery in China will be raised to a new level.

8480

CSO: 1008/127

NEW LUNG CANCER SURGERY DESCRIBED

Shanghai WEN HUI BAO in Chinese 4 Jul 83 p 1

Article

Text Some lung cancer patients whose cancers were judged inoperable by Chinese and foreign medical experts have had a chance for surgical treatment at the Shanghai Institute of Thoracic Medicine. Of 3,100 lung cancer operations carried out at the institute, about a third of the cases had been judged inoperable, but an effective prolongation of life was achieved. This accomplishment indicates that Chinese research on expanding the indications for lung cancer surgery has moved into the front ranks worldwide.

Lung cancer is one of the most life-threatening malignancies. Because its early symptoms are not readily apparent, it is difficult to discover it in time, which makes treatment difficult. Surgery is the most effective of the currently available treatment methods. But because of limitations resulting from the patient's condition and technical considerations, surgery is indicated in only 25 percent of confirmed lung cancer cases.

The Shanghai Institute of Thoracic Medicine's chief surgeon Wu Shanfang Q702 6365 5364 and other physicians rejected the previous idea that certain types of cancer are inoperable and conducted vigorous research on expanding surgical indications, along with clinical work. In the past, advanced lung cancer was viewed as inoperable. Dr. Wu and his coworkers carried out systematic studies on these cases and discovered that some of the patients were still operable. They have already operated on 800 patients with different types of advanced lung cancer, achieving 5-year survival rates of from 14.4 to 49 percent; the treatment results in some cases surpassed advanced world standards. Because undifferentiated small-cell cancer is highly malignant, medical circles throughout the world consider it inoperable. The institute's medical personnel have cooperated closely and have already performed surgery on 200 patients in this category; postoperative follow-up surveys on 143 of them indicated a 5-year survival rate of 15 percent, including some third-stage patients.

Tumor biology shows that if the thoracic cavity is opened and then closed again without removing the tumor, metastasis may result, which is very harmful to the patient. The institute's medical personnel have a great sense of

responsibility for the patients, and they conduct various examinations before the surgery to predict whether the tumor can be excised; the surgery rate is over 90 percent. Because in lung cancer patients 70 years old or more the disease is generally accompanied by weakened function of the respiratory, circulatory and other systems, the dangers of surgery are particularly great. The medical personnel of the institute have thrust aside difficulties and performed surgery on more than 100 very old lung cancer patients. Recently they performed 50 operations with no deaths; the patients' 5-year survival rate was 28.2 percent.

8480

CSO: 4008/164

LIFE SCIENCES

NEGATIVE PRESSURE LABORATORY BUILT

Beijing JIANKANG BAO in Chinese 4 Oct 83 p 1

[Article by Hu Feng [5170 3536]: "The First Vacuum Laboratory in Our Country Is Basically Completed"]

[Text] The first negative pressure laboratory building is now basically completed. The building is located within the Chinese Academy of Sciences Institute of Genetics.

The building occupies an area of 1,960 square meters. Counting the basement, the building contains four stories. The building is equipped with the following rooms: a bacteria-free room, biochemistry room, culture room, high-precision equipment room etc. To guarantee that the work proceeds under negative pressure conditions, the building has been completely sealed and equipped with a two-way power supply system. Ventilators are used to exhaust indoor air to the outside and keep the indoor negative pressure condition. All laboratory personnel must undergo a body purifying procedure before entering the laboratory. Physical and chemical sterilization equipment and a communications system are yet to be installed to protect the safety of personnel.

After completion of the building, various instruments for biological experiments and biochemical analyses will be installed so that genetic engineering, cytology and other medical sciences can be pursued in our country using modern equipment.

12453
CSO: 4008/66

LIFE SCIENCES

PRENATAL DIAGNOSTIC TECHNOLOGY MEETS ADVANCED WORLD STANDARDS

Beijing JIANKANG BAO in Chinese 23 Oct 83 p 1

[Article by Xu Huaijin [1776 2037 6855] and Sun Liji [1327 4409 1015]:
"Prenatal Diagnostic Technology Meets Advanced World Standards--Shanghai
Children's Hospital Research Achievement on DNA Analytical Technique in
Diagnosing Hereditary Disease"]

[Text] The Medical Genetics Research Laboratory of Shanghai Children's
Hospital and other units have achieved success in using the rapid micro-DNA
(deoxyribonucleic acid) molecule hybridization technology in the prenatal
diagnosis of Bart's [bate 1572 3676] edema embryo.

Bart's hemoglobin edema embryo syndrome is a common hereditary disease. The
embryo lacks 2 globin gene and cannot produce hemoglobin, thus causing
oxygen deficiency, edema stillbirth and premature death of new borns. At
the later stages of pregnancy, edema of the entire body and the accompanying
high blood pressure seriously endanger the life of the pregnant woman.
The restricted DNA neigie [0355 0434] (excision?) enzyme technology has been
used in some of the world's advanced laboratories to measure the amount of 2
globin in the embryo during prenatal diagnosis. Restricted DNA neigie (exci-
sion) enzyme is very expensive and is not feasible for extended use in our
country. The Genetics Research Laboratory of the Shanghai Children's Hospital,
while studying the technology of restricted neigie enzyme, also invented a
rapid micro-DNA molecule hybridization technique. From the amniotic fluid
drawn from a pregnant woman during the first 3-4 months of pregnancy, the DNA
is extracted and the 2 globin proportion can be measured to determine if it
is deficient. The examination procedure takes 33 hours.

The Medical Genetic Laboratory of the Shanghai Children's Hospital in coopera-
tion with the Shanghai Institute of Cell Biology, Shanghai International
Peace Clinic for Women and Children, Guangxi Zhuang Autonomous Region People's
Hospital, Third People's Hospital affiliated with the Shanghai Second Medical
College and First Shanghai Women and Children's Health Care Clinic etc. made
clinical use of the technology. They did gene diagnoses on seven pregnant
women facing the danger of carrying Bart's hemoglobin edema embryos. Simul-
taneously, tests using the restricted neigie [excision] enzyme spectrum analysis
technique were conducted. The results from these two different analyses were
identical. The new diagnostics method on Bart's hemoglobin edema embryo has
proved to be accurate, and reliable and suitable for extensive use in our
country.

Since the Bart's edema embryo can be detected before symptoms appear in the
pregnant woman, pregnancy can be terminated in time to protect the health of
the woman. The technology is significant for embryo quality forecast family
planning and eugenics.

LIFE SCIENCES

REFORM OF HEALTH ORGANS IN RURAL AREAS

Beijing JIANKANG BAO in Chinese 4 Sep 83 p 1

[Speech by Comrade Jiang Jiazhu [5592 1367 4554] on reform of health organs in rural areas]

[Text] Following the national meeting of the heads of all public health departments, a timely public health work meeting was convened in Yunnan Province. The reform of rural public health organs was the major topic under discussion and planning. The old medical practice has been going on for sometime, and we all agree that reform is now inevitable. Comrade Jiang Jiazhu, head of the Public Health Department of Yunnan, recently talked about his ideas concerning reform in public health practice.

Reforms of Commune Hospitals

There are 1,475 commune hospitals in Yunnan, 90.1 percent of them run by the state and the rest run by collectives. Wages and operational expenses for hospitals run by the state are drawn from the state. The maladies of everyone "eating from the big pot," "no business accounting" and overstaffing are manifest in the state-run hospitals.

In line with the spirit of the all-nation public health department heads meeting, three kinds of primary reforms in commune hospitals are now underway:

(1) A responsibility system for tasks contracted and flexible money awards. Commune hospitals contract jobs from the county public health bureaus. Money awards will be given to those who have done more than the quota specified in the contracts. The amounts of the awards are calculated according to the 100-point system. Bonuses are drawn from the revenue gained through the above-quota portion of the total revenue. Awards may be calculated according to the proportions of 2:8, 3:7, 4:6 or 5:5.

(2) Negotiable contracts, awards, wages and flexible money awards. Personnel are assigned to tasks, and economic indicators are set. Whenever there is overfulfillment of a specified quota, a money award is to be given. So far as wages are concerned, 80 percent of the total wage expense is distributed as attendance wages, while 20 percent of the total wage expense will be distributed as task wages to float with the bonuses earned.

(3) All-around contract system. Wages and money awards are to be drawn from the revenue gained through operations. The amount of traditional wages as handed down from higher-level organs will be saved as accumulation, or the public health bureau will subsidize the expenditure for certain specified items.

These three forms of reform are undergoing experiments in many locations and have achieved fine results as manifested in:

(1) Mobilized initiative of staff and workers, disappearance of overstaffing, reduced absenteeism and full attendance by the majority of staff and workers.

(2) Improved attitude toward patients, large increase in work volume and widespread positive medical practices. Where once they declined to give service, now they compete to give it. Once they were aloof, but now they are enthusiastic. Some even quit sitting around in the hospital to venture into reaching out to the masses in the countryside. During the past half year in Zhenxiong County, the commune hospital dispatched a total of 122 medical personnel to care for 9,705 persons in the country side--a 3.52-fold increase in service over the same period of last year. Outpatient registration in Anning County increased by 9,294 persons over the same period of last year. Inpatient bed-days increased by 5,029. Many hospitals are now practicing all-day outpatient service.

(3) New items of medical service have been added. Quality of treatment has improved. Some hospitals added beds, others set up beds in patients' homes. New businesses in physical examination, tooth extraction and acupuncture operations were set up. Many hospitals now do their best to accommodate seriously burned and poisoned patients whom they once refused to accept.

(4) Increased economic results through thrifty operation. The county street hospital of Anning County increased its outpatient income by 39.44 percent from April to July of this year (compared with the same period last year). The increase in income from inpatient service is 2.37-fold. Business income from the commune hospital of Zhenxiong County increased by 53.24 percent. Expenses for water, electricity, medical materials and debts have dropped substantially.

However, due to the lack of experience, a few new problems have yet to be tackled in the course of reform:

(1) Some units tend to be "eyeing for the money" exclusively and pursuing ever higher money awards. Their primary concern is the economic indicator. Due to the lack of a good appraisal and inspection system, the work indicator lacks substance. Epidemic prevention and maternal and child health care are sometimes neglected. The supervision of brigade public health organs is not firmly grasped, even to the point of total negligence.

(2) Some hospitals waste medicine, resulting in a heavy burden to the state and to the masses. The fees for the private- and public-expense inpatient charge have reached 19.53 yuan and 23.73 yuan a bed-day, respectively. Some doctors prescribe medicine according to the amount of money a patient is prepared to pay. Some doctors prescribe tonics indiscriminately.

Reform of Brigade Public Health Organs

There are 13,764 brigades in Yunnan Province. According to the 1982 end of the year statistic, 92.38 percent of the brigades have public health organs. The total number of barefoot doctors is 28,874, among whom 35.58 percent are village doctors.

Ever since the implementation of medical cooperation in 1969, Yunnan Province has been tossed around between left and right. Under the influence of leftist ideology, the control was too tight, the responsibility was too large and thus the cooperation was detached from reality and lost its solid ground.

After the 3d Session of the 11th CPC Central Committee, there has been the pursuit of the all-around contract responsibility system. The leftist influence is being eradicated and reforms in the brigade public health organs are underway. Multiformal medical practices are being carried out to adapt to different situations. The major practices are:

- (1) The brigade provides a building and capital. Management makes sure that the capital is recovered. Sometimes a portion of the charge from patient registration, injection and gains made from the difference between batch purchasing and retail charge is saved as the accumulation. This is the most commonly used form of medical practice.
- (2) Collective investment by members. Patients pay a registration fee or part of the medical charge. This method is occasionally adopted by well-to-do brigades.
- (3) The brigade provides for capital and for compensation to barefoot doctors. Patients are charged.
- (4) Permission for barefoot doctors to practice medicine in private.

The implementation of multiformal medical practices has lent convenience to the masses and satisfaction to the barefoot doctors. The benefits are:

- (1) The difficulties in money raising, lack of medicine and lack of capital for health stations are alleviated. There is usually enough medicine, and the disease prevention and treatment needs of the members are basically met. Some stations have more accumulations than others, with medical assets reaching tens of thousands of yuan.
- (2) The enthusiasm of barefoot doctors is mobilized along with an improved attitude toward patients. Treatment stations are manned and medical personnel are available to make house calls.
- (3) On the plains and in the semi-mountainous regions where economic conditions are good, capital recovery management solved the prolonged and difficult problem of compensation for barefoot doctors. In addition to contracting their share of land, the barefoot doctors can receive 30-50 yuan per month compensation from the "two fees" they charge. This is higher than what they

used to get from the old work-point-plus-subsidy system. Some barefoot doctors have incomes of 60-80 yuan per month. All that is required from the state now is some subsidy for epidemic prevention and for health care operations for woman and children.

With the reform in the brigade public health organs, new situations and new problems also arise:

(1) After implementing capital recovery management, some barefoot doctors are unwilling to accept the tasks of epidemic prevention and the health care of women and children. Medical practices in these areas are weakened. Furthermore, in the frontier and remote mountainous regions where population is sparse, the problems of doctor remuneration and the raising of advanced capital are yet to be solved. Appropriate state support and subsidy are needed.

(2) When not under strict supervision, the barefoot doctors engaging in individual practice or practicing capital recovery management often charge high medicine fees.

(3) Since there is a lack of funds to subsidize people while they are receiving medical training, there have been increasing difficulties in training new barefoot doctors. People are reluctant to leave their paid work for unpaid training.

(4) Some brigades manage public health stations as sideline occupations. They draw funds from these health stations and use them for other non-medical purposes. The social welfare nature of the public health work is being violated.

Medical reform work has started, and existing problems are many. Resistance has been met in many regions while many other units are still looking on. We must persevere, and firmly grasp the reform of public health organs on two levels to serve the causes of better public health service for the masses.

12453

CSO: 4008/66

LIFE SCIENCES

BRIEFS

HEMORRHAGIC FEVER VIRUS--Renal-syndrome hemorrhagic fever is a common disease, with a high death rate, produced by a natural vector. In the last few years, a virus from rats, the main carries of this disease, has been isolated abroad. The PLA Academy of Military Medicine and the Institute of Military Medicine under the Shenyang command have cooperated in the first successful effort to isolate the virus directly from the blood of a person suffering from the disease, thus laying the groundwork for its diagnosis and prevention. [Text] [Beijing RENMIN RIBAO in Chinese 7 Jun 83 p 5] 8480

CARDIAC DISEASE SYMPOSIUM--The national symposium on prevention of cardiac diseases resulting from pneumonic trouble was held in Nanning from 22 to 28 November. The symposium disclosed that China's medical research personnel have made remarkable achievements in preventing cardiac diseases which result from pneumonic troubles, with the death rate dropping from 31 percent in the past to 16 percent at present. A total of 250 people, including some professors and experts, attended the symposium. [Summary] [HK061456 Nanning Guangxi Regional Service in Mandarin 1130 GMT 2 Dec 83 HK]

CSO: 4008/86

Astronautics

AUTHOR: FU Li [0102 7787]
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ORG: None

TITLE: "The Extended Z-Transform Method, A Variable Parameter Analysis and Design Method of Computer Guidance System"

SOURCE: Beijing YUHANG XUEBAO [JOURNAL OF THE CHINESE SOCIETY OF ASTRONAUTICS] in Chinese No 4, 30 Oct 83 pp 30-39

ABSTRACT: A guidance system, such as a homing system, is a variable parameter system with singularity causing it to remain a difficult problem to this day. This paper introduces a general or extended z-transform method. With this method, the system is turned into an algebraic calculation. In separate chapters, this paper discusses the computer guidance system, introduces the z-transform into the system analysis, explains the condition for the singular solution of the differential equation containing singular point of a function, and gives the system synthesis of $D(Z^{-1})$ to complete the computer program.

This paper was received for publication on 18 October 1982.

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TITLE: "One-dimensional, Two-phase Constant Lag Flow in Combustion Chamber of Solid Propellant Rocket Motors"

SOURCE: Beijing YUHANG XUEBAO [JOURNAL OF THE CHINESE SOCIETY OF ASTRONAUTICS] in Chinese No 4, 30 Oct 83 pp 40-52

ABSTRACT: Current studies on two-phase flow of solid fuel rocket engines concentrate mostly on the nozzles: Kliegel's study, for example, produces a solution similar to isentropic flow. During combustion, the solid propellant, containing an aluminum complex, produces Al_2O_3 particles in colloidal phase, weighing as much as 30-40 percent of the total combustion product. Mass is, therefore, added to the two-phase flow in the combustion chamber to assume a characteristic different from that of the exhaust nozzle. The effects of the velocity lag of the particles on the pressure-time curves and the flow field of the particles on the pressure-time curves and the flow field of the combustion chamber are analyzed to provide the boundary condition for more accurate calculations. It is demonstrated in the paper that: 1) The lag causes the pressure of the combustion chamber to drop, the combustion time of the propellant to lengthen, and the nozzle flow volume to be smaller; and 2) as the lag increases, the speed of flow of the gaseous phase is greater, the pressure and the density of the gaseous phase decrease, the velocity of the particles falls while their density increases. On the other hand, the lag has very little influence on the temperature of the gaseous phase and the particles.

This paper was received for publication on 29 November 1982.

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TITLE: "A Method for Calculating Error in the Measurement of Mass Flow Rate of Cryogenic Fluids"

SOURCE: Beijing YUHANG XUEBAO [JOURNAL OF THE CHINESE SOCIETY OF ASTRONAUTICS] in Chinese No 4, 30 Oct 83 pp 63-70

ABSTRACT: On the basis of a previous study (DIWEN WULI No 2, 1982 p 136) this paper examines the principle of measuring the dielectrical constants of cryogenic fluids using a microwave cavity tuned oscillator to obtain a relationship between error in measurement and the measuring speed. The delay time of the delay line is analyzed with respect to the quality factor of the cavity to produce a basis for optimal design of the cavity. Finally, through both calculation and experimentation, it is demonstrated that when the fluid flows through the cavity at a velocity of v , the relative error is the order of v/c , where c is the velocity of light. It was concluded that the microwave cavity tuned oscillator is entirely suitable for measuring fast-flowing fluids without producing significant instrumental errors.

This paper was received for publication on 4 December 1982.

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TITLE: "Manufacturing Process and Cold Deployment Test of an Extendible Nozzle Exit Cone Made of Niobium Alloy"

SOURCE: Beijing YUHANG XUEBAO [JOURNAL OF THE CHINESE SOCIETY OF ASTRONAUTICS] in Chinese No 4, 30 Oct 83 pp 71-80

ABSTRACT: A brief introduction of the salient features of the extendible nozzle exit cone and the properties of the niobium alloy, C-103 is given. For manufacturing a medium-sized test-piece, processes of flow-turning, deep-drawing, and mandrel expansion were adopted. The C-103 showed no sign of hardening. After it was extensively deformed, proper annealing appeared to be favorable for restoring its plasticity. Annealing was performed in a vacuum furnace of 10^{-4} of mercury, at a temperature of $1250 \pm 5^\circ\text{C}$, maintained for 1 hour. Detailed results of the cold deployment test of the test-piece are analyzed and reported.

This paper was received for publication on 10 December 1982.

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TITLE: "Some Problems in High Speed Turbopumps"

SOURCE: Beijing YUHAN XUEBAO [JOURNAL OF THE CHINESE SOCIETY OF ASTRONAUTICS]
in Chinese No 4, 30 Oct 83 pp 81-90

ABSTRACT: The turbopump is an important part of a liquid rocket engine and must be reliable, light weight, and efficient. The designing difficulty involves the fact that the turbine operates at a high temperature and a high rotational speed while the pump works under low or normal temperature, high pressure, and high rotational speed. In separate chapters, this paper discusses problems in developing a turbopump of high rotational speed, in designing a pump of high cavitation property, in designing high-speed bearings, in designing composite seals of high-speed rotary axes, and in guaranteeing the strength and dynamic stability of the rotors. Calculations, schematic diagrams, and photos are given to explain good and faulty designs.

This paper was received for publication on 2 December 1981.

6248

CSO: 4009/25

Geochemistry

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TITLE: "Natural Organic Substance and Its Implication in Uranium Mineralization"

SOURCE: Beijing DIQIU HUAXUE [GEOCHEMICA] in Chinese No 3, Sep 83 pp 294-302

ABSTRACT: In China and abroad, many uranium deposits have been found to be directly or indirectly linked to the presence of organic matter. Among the various types of natural organic matter, "humus and asphalt, being extensively distributed in such sedimentary rocks as shale, sandstone, limestone, etc., are more closely related to uranium mineralization. On the basis of foreign and domestic reports of the subject, this paper gives a comprehensive discussion on the types of natural organic substances and their functions in the migration and concentration of uranium, including their actions of reduction, precipitation, adhesion and absorption. Aside from data quoted from publications of Sweden, Canada, the USSR, the United Nations and the United States, data describing the form and content of organic matters and their relationship with the uranium content of some ore bodies in the 740 Mining District of an unspecified location in China are also mentioned to illustrate the discussion.

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TITLE: "Geochemistry of Gold Deposits in the Region of Western Hunan and Eastern Guangxi in China"

SOURCE: Beijing DIQIU HUAXUE [GEOCHEMICA] in Chinese No 3, Sep 83 pp 230-240

ABSTRACT: There is a concentration of gold deposits in the region of W. Hunan and E. Guangxi, an area of many groups of associated elements, including tungsten-antimony-gold, tungsten-gold, antimony-gold, lead-zinc-silver-gold, uranium-silver-gold, and simple gold. Based upon field survey and laboratory research data, this paper discusses the distribution, sources, processes and forms of migration and concentration, and mineralization action of the gold. Aside from colorimetric analysis of a portion of the specimens, chemical concentration and emission spectrum methods are used in the study to demonstrate that the ore-forming materials obviously originate from the country rocks

themselves and mineralization is mainly related to regional metamorphism or alkali metasomatism. In the mineralization process, the gold migrates mainly in the form of $\text{Na}[\text{AU}(\text{SH})_2]$. Native gold or electrum is precipitated from hydrothermal solutions and concentrated into ore deposits in environments of obviously reduced T, pH, and $f\text{O}_2$.

6248

CSO: 4009/22

Medicine

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TITLE: "Production of Monoclonal Antibodies Against Japanese B Encephalitis by Mouse Hybridoma Technique"

SOURCE: Beijing ZHONGGUO YIXUE KEXUEYUAN XUEBAO [ACTA ACADEMIAE MEDICINAE SINICAE] in Chinese No 4, 1983 pp 210-214

ABSTRACT: Three monoclonal antibodies against JE virus were obtained by fusion of SP₂/0 myeloma cells with spleen cells from BALB/C mice immunized with JE SA₁₄ strain.

Monoclonal antibody "32" showed antibody activity against JE and other group B arboviruses (Kunjin and West Nile virus) as determined by HI test. Monoclonal antibody "51" demonstrated activity in neutralization and indirect immunofluorescent antibody assay only with JE virus, but not with other group B arboviruses. Monoclonal antibody "43" showed activity only against JE SA₁₄ which was used for immunization of the animal and its avirulent 2-8 derivative but not with other JE (JAK₂ strain).

It is interesting to find out monoclonal antibody "51" neutralized avirulent 2-8 strain 2-4 fold more than its parent SA₁₄ strain.

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TITLE: "A Convenient Method for Purification of JEV Genome-sized RNA"

SOURCE: Beijing ZHONGGUO YIXUE KEXUEYUAN XUEBAO [ACTA ACADEMIAE MEDICINAE SINICAE] in Chinese No 4, 1983 pp 264-266

ABSTRACT: A reproducible, accurate and convenient method for purification of JEV genome-sized RNA from total nucleic acid extracted from infected mouse brain is described. The total nucleic acid strained with ethidium bromide was analysed by horizontal slab agarose gel electrophoresis and the bands corresponding to three different species of the virus specific RNA (RI, RF, genome-sized RNA) in addition to the cellular RNA's were clearly observed. By preparative agarose gel electrophoresis, a discrete band corresponding to 42S RNA was found and this was cut out and eluted. This eluted RNA component was consistent with the characteristics of viron RNA with respect to the molecular weight infectivity and RNase digestibility. The purified genome-sized RNA was capable of translation in wheat germ cell-free system. The value of practical use and restrictions of this method are discussed.

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TITLE: "On the Purification JEV Infectious RNA From Infected Mouse Brain and Its Translation in Cell-free System"

SOURCE: Beijing ZHONGGUO YIXUE KEXUEYUAN XUEBAO [ACTA ACADEMIAE MEDICINAE SINICAE] in Chinese No 4, 1983 pp 267-268

ABSTRACT: The purification of JEV infectious RNA from the total nucleic acid extracted from infected mouse brain and its translation in cell-free system were studied. The total nucleic acid extracted from JEV infected mouse brain was chromatographed on methylated albumin-kieselguhr column. It was eluted with stepwise increasing concentration of NaCl-phosphate buffer. The JEV infectious nucleic acid eluted from the column appeared later than the cellular RNA. The optimal concentration of NaCl-phosphate buffer for eluting the infectious nucleic acid was 0.9 M. On an average, the recovery of the infectious RNA with such a concentration of eluting buffer was around 83 percent and more than 95 percent of the cellular RNA has been eliminated. The method adopted is useful for large-scale isolation of JEV infectious RNA. The purified infectious RNA was capable of translation in wheat germ cell-free system. The possible practical use and defects of this purification method are discussed.

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TITLE: "Study on Vectors of Cloning System in *Bacillus subtilis*"

SOURCE: Beijing ZHONGGUO YIXUE KEXUEYUAN XUEBAO [ACTA ACADEMIAE MEDICINAE SINICAE] in Chinese No 4, 1983 pp 205-209

ABSTRACT: In this paper the reconstruction in vitro, isolation, and characterization of two new plasmids, pHE₂ and pHE₃ were presented. Data from restriction enzymatic analysis, determination of transformation activities and their molecular weight as well as the expression of their antibiotic resistant genes confirmed that pHE₂ and pHE₃ are covalently closed circular DNA's with molecular weight of 4.9×10^6 and 2.7×10^6 daltons, respectively. The pHE₂ carries the genes resistant to ampicillin, kanamycin and neomycin. It has single restriction sites for EcoRI, BamHI, PstI and BglII and can transform both *B. subtilis*, BR₁₅₁ and *E. coli* C₆₀₀. The pHE₃ expresses resistance to ampicillin, carbenicillin and cephaloridinum. It has single restriction sites for EcoRI, BamHI, PstI and XbaI. Studies on the application of these two vectors are underway.

CSO: 4009/14

Military Medicine

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TITLE: "Synopsis of Papers Submitted to the First Conference of Respiratory Internal Medicine of All Military Hospitals"

SOURCE: Beijing JIEFANGJUN YIXUE ZAZHI [MEDICAL JOURNAL OF CHINESE PEOPLE'S LIBERATION ARMY] in Chinese Vol 8 No 5, 1983 pp 391-394

ABSTRACT: The First Conference of Respiratory Internal Medicine of All Military Hospitals was held on 6-10 May 1983 at the Chongqing Third Military University of Medicine. A total of 283 papers were received. Contents of these are divided into the following categories for brief synoptic discussions in the paper: (1) Adult respiratory distress syndrome; (2) cardiopulmonary diseases and bronchial asthma; (3) tuberculosis of the lung; (4) infection of the respiratory tract; (5) lung cancer; (6) examinations of pulmonary functions; (7) other topics, including bronchoscopy, biopsy, pulmonary blood circulation, analysis of fluid in the chest, spontaneous emphysema, etc.

This paper was received for publication in July 1983.

6248

CSO: 4009/24

END