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**SCIENTIFIC INFORMATION REPORT
CHINESE SCIENCE**

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SCIENTIFIC INFORMATION REPORTChinese Science (16)

This is a serialized report consisting of unevaluated information prepared as abstracts, summaries, and translations from recent publications of the Sino-Soviet Bloc countries. It is issued in six series. Of these, four, Biology and Medicine, Electronics and Engineering, Chemistry and Metallurgy, and Physics and Mathematics, are issued monthly. The fifth series, Chinese Science, is issued twice monthly, and the sixth series, Organization and Administration of Soviet Science, is issued every 6 weeks. Individual items are unclassified unless otherwise indicated.

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ERRATUM

In Summary No 4028, Scientific Information Report, Chinese Science (14), page 16, line 24, the source of the item should be "Hanoi, Quan Doi Nhan Dan, 4 Oct 62, p 4."

AGRICULTURAL SCIENCES

NAN-KAI UNIVERSITY RESEARCH AIDS AGRICULTURE -- Peiping, Kuang-ming Jih-pao, 11 Nov 62, p 2

The Chemistry Department and Biology Department of Nan-kai University are conducting research to aid agriculture in the field of agrochemicals, combating of insect pests, plant physiology, and breeding. These two departments have systematically summarized their work in a series of over 20 research papers.

According to Prof Yang Shih-hsien (2799/4258/0341), president of the university, and Prof Ch'en T'ien-ch'ih (7115/1131/3069), the Organophosphorus [Compounds] Laboratory of the Chemistry Department has been conducting research for the past few years in synthesizing new organophosphorus agrochemicals. In all, they have synthesized over 100 compounds; of these compounds, over 30 have already been used in insect experiments by related research units. Ten of the compounds not only have good absorptive qualities, but also display selective toxicity toward insects. Some of these compounds have been sent for field testing to Yunnan, Kiangsu, Kwangtung, Kwangsi, and Hopeh provinces.

Some of the insecticides developed are five times as toxic as DDT to mosquito larvae; others, though comparatively nontoxic to men and beasts, are completely effective in controlling red spiders and aphids, even when deluted to concentrations of 1-5 parts per 100,000. The Agrochemical Laboratory, under the direction of Prof Ch'en Ju-yu (7115/5423/3768), has, in the past few years, successfully synthesized 18 improved agrochemical compounds, including some that combat wheat rust, sweet potato black rot, paddy-rice diseases, and cotton bud and boll shedding. Others include phytocides and plant supplements. Recently, Ch'en T'ien-ch'ih and Ch'en Ju-yu have written research papers, entitled "Research on Organophosphorus Agrochemicals" and "Notes on Agrochemical Research," describing the new approaches used in the development of these new compounds.

Prof Hsiao Ts'ai-yu (5135/6846/3842), an entomologist and head of the Biology Department at the university, has completed seven papers in the past year on Hemiptera. In a recent paper, Professor Hsiao stressed the importance of the development compounds with high specificity and stressed the importance of close cooperation between biology and microbiology in the development of methods of combating pests.

CHEMICAL PREPARATION PREVENTS SWEET POTATO SPOILAGE -- Peiping, Kuang-ming Jih-pao, 7 Nov 62, p 2

This year, the Scientific-Research Institute of the Chekiang Province Food Department has carried out small-scale experiments on the storage and resistance to spoilage of fresh sweet potatoes and has given preliminary confirmation of the effectiveness of chemical compound "401." Sweet potatoes are a high production food crop. Because of their high moisture content, softness, and thin skins, they are difficult to store. They often become bruised and infected with bacteria during harvesting, transport, and storage. Late last year, this research institute began carrying out experiments on the prevention of spoilage and found that "401" was the most effective chemical preparation. After 2 months of storage, sweet potatoes treated with this chemical showed a spoilage rate of only 3.22 percent and a moisture loss of only 12.92 percent. Treatment with this chemical has no effect on the color, odor, or taste of the sweet potatoes. When used for sprout germination, there is no reduction in the sprouting rate, and the plants grow well. Preparation "401" is an inexpensive chemical compound, and its use as a sweet potato preservative will be easy to promote.

DESIGNATIONS OF INSECTICIDES EXPLAINED -- Peiping, Jen-min Jih-pao, 6 Nov 62, p 5

The formula for "1605" is $C_{10}H_{14}NO_5PS$. Originally, the inventor compounded it as an emulsion and gave it the designation "E605." The "E" stands for "Emulsion," but in reading, the "E" was confused for the [Chinese] number "1," and the chemical was designated "1605."

The compound known as "1059" is an organophosphorous, internal adsorption insecticide. The inventors originally designated it "E1059," but the "E" was later dropped.

The chemical name of "666" is Hexachloro-cyclohexane or Benzene Hexachloride, and its formula is $C_6H_6Cl_6$. It is an organic chlorine insecticide. Since it is composed of 6 carbon atoms, 6 hydrogen atoms, and 6 chlorine atoms, it is called simply "666."

FUKIEN ACADEMY MANUFACTURES NEW AGRICULTURAL CHEMICALS -- Canton, Chung-kuo Hsin-wen, 30 Oct 62, p 9

The Fukien Design and Research Academy of Chemical Engineering has been rather successful in manufacturing new agricultural chemicals from resources indigenous to the province. The agriculture section manufactured a new chemical, chloride of turpentine, using Fukien-produced turpentine, which can protect seven different crops from serious insect damage with comparatively good results. An engineer produced another new chemical, Ming-nung No 3 [literally, Fukien agriculture No 3], using a waste material from chemical industry products, which is effective in preventing wheat rust. Another new chemical, Ming-nung

No 4, has been prepared from chemical products produced from forest products and is also effective against wheat rust and promotes increased weight in the grains. The academy is now test manufacturing a new chemical to protect paddy rice against disease and insect damage.

SOOCHOW PLANT PROTECTION WORKERS FIGHT INSECT PESTS -- Peiping, Kuang-ming Jih-pao, 15 Nov 62, p 2

The Soochow Special District Institute of Agricultural Sciences, established since the liberation, has done a great deal of work in the use of agrochemicals in the combating of the paddy rice borer, the most serious insect pest in Soochow Special District. During 1962, this institute of agricultural sciences has been working closing with the 35 disease and insect prevention planing and reporting stations in the district.

KIRIN BRANCH, ACADEMY OF AGRICULTURAL SCIENCES, DEVELOPS NEW CROP VARIETIES -- Peiping, Kuang-ming Jih-pao, 14 Nov 62, p 2

The Institute of Crop Breeding and Cultivation of the Kirin Branch, Chinese Academy of Agricultural Sciences, has over the years emphasized the collection, processing, and preservation of the resources of varieties of crops, of altogether more than 11,000 elementary materials of 23 crops, including soybeans, wheat, paddy rice, corn, kaoliang, and millet, which it uses for selective breeding.

In view of the cultivation objectives of various kinds of crops, researchers have systematically studied biological characteristics and economic values. They have defined the ecological forms of various varieties of crops of different areas; for example, in accordance the with the origin and distribution of the elementary materials of soybeans, they separated and divided them into three groups: limited pods, sublimited pods, and unlimited pods. These formed the basis used to obtain new varieties through selective breeding.

Having analyzed resources and the evidence of all kinds of experts, the institution did research on plant resistance to disease and insect injury. From 270 varieties of soybeans, it developed 76 varieties that are subject to relatively light insect damage; from over 1,000 varieties of spring wheat, it developed 330 varieties that are resistant to wheat rust. It selected pest-resistant and cold-resistant varieties of paddy rice and did research on the special characteristics of stage development of varieties of important crops such as paddy rice, spring wheat, and soybeans. It has developed new varieties such as Kaoliang Hu (2366) No 2, Millet 1104, and Soybean Chi-t'i (7162/7555) No 1, all characterized by their resistance to disease, strong plants, and high yields. Some varieties of seed have been distributed to the peasants, and they were most happy to receive them.

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CHINA'S AGRICULTURAL SCIENTISTS RAISE MANY NEW VARIETIES OF CROPS -- Canton, Chung-kuo Hsin-wen, 30 Oct 62, pp 8-9

There have been 487 superior varieties of 26 kinds of agricultural crops developed over the past 30 years or so, according to statistics from 17 provinces including Kiangsu, Kwangtung, Szechwan, Kirin, and Shensi. Scientific experiments and production demonstrations certified that these superior varieties are 10-40 percent more productive than the original improved varieties.

The Kirin Branch of the Chinese Academy of Agricultural Sciences has developed a variety of keng [nonglutinous] paddy rice suitable for cultivation in the northern paddies.

The Institute of Crop Breeding and Cultivation, Chinese Academy of Agricultural Sciences, and Peiping Agricultural University have independently developed three varieties of wheat with yields up to 700-800 chin per mou, which have already become popular in the northern part of North China.

Through experiments over the past several years, 18 top-grade varieties of cotton grown in several provinces, including Kiangsu, Hopeh, Kiangsi, and Shensi, have been identified and are now being reproduced and made popular. Compared with the varieties now being grown, these are superior in length of fiber, i-fen-lu (5902/0433/3764) [possibly lint-fuzz ratio], and yield.

Besides these, a group of superior varieties of many crops is being raised, including such things as corn, soybean, sweet potatoes, oil-bearing vegetables, jute, sugar beets, tobacco, and white potatoes, which many places are now engaged in demonstrating and popularizing.

AGRICULTURAL RESEARCH CONDUCTED IN SHENSI PROVINCE --- Peiping, Kuang-ming Jih-pao, 10 Nov 62, p 2

The Wu-kung Region of Shensi Province is an active center of agricultural research. Over ten research units are located in this area, including the Shensi Branch, Chinese Academy of Agricultural Sciences, and the Northwest Agricultural College, as well as research units of the Institute of Soils, Plant Protection, Agricultural Mechanization, Grains, and Water Conservancy.

Since 1959, workers in the Institute of Plant Protection have studied over 6,000 varieties of wheat in their efforts to study the pathogenesis of wheat rust and to develop disease-resistant varieties. Working with the Sian Agricultural Machinery Plant (Hsi-an Nung-hsieh Ch'ang; 6007/1344/6593/2750/0617), Instructor Li Fei-hsiung (2621/7378/7160), Agricultural Machinery Department, Northwest Agricultural College, has designed a suspended 16-row centrifugal sower.

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SHANSI AGRICULTURAL COLLEGE AIDS ANIMAL HUSBANDRY -- Peiping, Kuang-ming
Jih-pao, 10 Nov 62, p 2

Teachers of the Animal Husbandry and Veterinary Medicine Department of Shansi Agricultural College have written up a number of reports on superior strains of domestic animals in Shansi after having completed on-the-spot investigation and research. The animals, which are representative of the types raised in various places in the province, include: the Chin-nan Ku-ts'u hybrid horse, the Shou-yang and K'o-lan fine-haired sheep, the Wan-jung ox, the T'ang-ch'eng fine-haired sheep, the Wen-hsi donkey, and the Wu-hsiang mottled pig. [All of the above Romanized compounds are place names in Shansi, except possibly Ku-ts'u of the first item, which literally means ancient and rough.]

Further, the teachers, along with the local production teams in the villages, held reports meetings, discussion meetings, and short-term training classes to disseminate technological information to the cadres and peasants.

On the basis of their research, the teachers assisted animal husbandry production units to formulate plans for raising domestic animals, presented evidence to show that stock can be improved through crossbreeding, and suggested measures for the reproduction and feed and care of domestic animals.

Assistant Professor LU Liu-wu (0712/0362/0710), sheep specialist, studied environmental conditions in Lingh'uan Hsien and discovered that this hsien is suitable for raising fine and semifine haired sheep. Under his recommendation and leadership, initial steps have been taken to raise such sheep.

Department Director CHANG Lung-chih (1728/5693/1807), hog specialist, in April and May of last year, supervised a group of teachers and students in studying and compiling a report on the Chin-nan improved hog, which project took them to farms and people's communes in four hsien.

Assistant Professor CHU Hsien-huang (2612/0341/3552) did extensive research on the breeding of the Chin-nan horse and made useful proposals to the concerned departments.

Assistant Professor CHI I-lun (0370/0001/0243) and three teaching assistants climbed 2,000 li into the hills to study the habits of hybrid cattle. They observed the animal's selection of food, travel, rumination, and rest periods to obtain firsthand valuable material for the current semester.

In the course of their investigations and research, the professors determined what the new topics in scientific research would be in accordance with the crucial problems that have developed in production. For example, in recent years many localities in the province have brought in many types of domestic and foreign improved hogs and crossbred them with local hogs; which combination will finally be best and how many generations of crossbreeding is necessary before a suitable combination is found? The teachers have categorized these problems in order to carry out scientific research. They have already made preliminary suggestions as to which hybrids are suitable for which places depending on the feed situation and they have made new claims for favoring the raising of native improved hogs.

NEW STRAINS OF CATTLE DEVELOPED IN INNER MONGOLIA -- Peiping, Kuang-ming Jih-pao, 10 Nov 62, p 2

Animal breeding teams organized by the Inner Mongolia Institute of Animal Husbandry and Veterinary Medicine (Nei-meng-ku Hsu-mu Shou-i K'o-hsueh Yen-chiu So; 0355/5536/0657/3964/3668/3757/6839/4430/1331/4282/4496/2076), the Inner Mongolia Agriculture and Animal Husbandry College (Nei-meng-ku Nung Mu Hsueh-yuan; 0355/5536/0657/6593/3668/1331/7108), and other units have been cooperating over the past several years with cattle breeding farms in various leagues to develop superior strains of cattle through selective breeding. Herds of cattle with qualities unequaled in their progenitors were developed on such farms as the Ao-han Sheep Farm, San-ho Cattle Breeding Farm, Ta-yen Horse Breeding Farm, and the San-ho Horse Farm.

The Ao-han sheep, originally a crossbreed but lacking in certain ideal qualities, has been developed into a new strain of fine-haired sheep, good for both wool and meat, through selective breeding over the past several years. It is physically strong, solid boned, heavy bodied, and adaptable and can eat coarse fodder; it is easily sheared, and the fibers are comparatively uniform.

The San-ho is Inner Mongolia's best cow, but in the original crossing many strains developed: its milk-producing characteristics were not uniform and its hereditary features not fixed. Through several years of selective breeding, a herd of superior cattle that is good for both milk and meat has been developed: the legs are well developed and the flesh is plentiful; it can eat coarse fodder and its milk yield is high.

The San-ho horse is big and strong and can be used for both riding and hauling, but its characteristics were unstable. Through selective breeding for several years, 1,000 horses of good strain have been developed.

The results of these investigations of breeding stock and the experimental research that went into developing superior strains have been compiled into book form and have been distributed to various localities for reference.

LIAONING RESEARCH INSTITUTE IMPROVES BREED OF CHICKEN -- Peiping, Kuang-ming Jih-pao, 9 Nov 62, p 2.

The Hsiung-yueh Research Institute of Agriculture, Liaoning Province, has improved the vitality and productivity of the degenerate Ta-ku [literally big-boned] chicken through selective breeding methods. The Ta-ku chicken, originally developed in Chuang-ho, Liao-tung Peninsula, is used for both eggs and food and is regarded very highly by the people of the area. It is big and heavy, has a handsome appearance, can eat coarse feed, is noted for its resistance to cold and drought, produces large, hard-shelled eggs, stores well, and is a good shipper. Owing to improper food and poor management, the chicken gradually degenerated.

During the last 6 years, the research institute has been inbreeding the chicken and conducting directed breeding experiments. In the course of this, eggs in the embryonic stage were exposed to cold conditions, the chick-raising period was pushed back, feed was fortified prior to the egg-producing period, and the moulting period was delayed and shortened. The vitality and productivity of the chicken was restored to what it formerly was: egg fertility rate, hatchability rate, chick viability rate, and chicken survival rate have arisen in varying degrees; and the egg-producing age has been pushed back 22-28 days. The number of eggs produced annually has been increased to 140; and the weight of the egg, to 62.6 grams. More than 100,000 improved Ta-ku chickens have been distributed to 10 municipalities and ~~h~~siens, including Mukden, during this period and were gratefully received by the peasants.

SHORTAGE OF VETERINARIANS NOTED -- Peiping, Jen-min Jih-pao, 17 Nov 62, p 2

During July and August 1962, all five foals born in Production Team No 2, Ch'ing-li Production Brigade, Hsing-fu Commune, Shuang-ch'eng Hsien, Heilungkiang Province, died of tetanus. Losses like this are due to the shortage of veterinarians. There are only five or six true veterinarians and five or six apprentices in Hsing-fu Commune to service the several tens of thousands animals. In addition to the shortage of veterinarians, part of the blame must be placed on some cadres and commune personnel that lack respect for veterinarians and do not wish to use their services.

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There are several remedies for this situation. There should be increased informal training of veterinarians, including lectures given by personnel from veterinary stations. Secondly, veterinarians now engaged in other lines of work ought to be released from these responsibilities in order that they might help relieve the problem. Finally, local remedies ought to be used, whenever practicable, in place of formal treatment.

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KWANGTUNG AGRICULTURAL COLLEGE INTENSIFIES RESEARCH TO AID AGRICULTURAL PRODUCTION -- Peiping, Kuang-ming Jih-pao, 9 Nov 62, pm2

Kwangtung Agricultural College has recently intensified its research on ~~problems~~ that are closely allied to efforts to increase agricultural production. Kwangtung has 18 million Mou of low-yield farm land, divided up principally between hilly land and strips of thin soil, which are normally ~~subject to~~ drought. A new variety of paddy rice that can endure thin soil and drought ~~undoubtedly~~ is an important research subject in Kwangtung agriculture. To strengthen research on the selective breeding and theory of a new variety of paddy rice, the college assigned four more personnel to do this kind of work.

Irrigation of the alluvial fields on San-chiao Island in the Pearl River, an important grain center in Kwangtung, depends primarily on tide water. The fields are irrigated 24 days or more each month, resulting in an annual accumulation of ~~back~~ up to 5 inches, which not only increases the depth of the cultivable layer and enriches it, but also brings in a saline and undecomposed material, which adversely affects the soil. This field of research is of considerable significance, and thus the number of researchers working on this problem has recently been increased.

Further, research on cultivation and rotation in the rice fields of hilly country, technological research on the sowing of green manure and the preservation of seed, selective breeding research on the ~~improved~~ local hog, preventive research on the castor bean silkworm, attacus ricini, and research on duck pest vaccine are closely related to agricultural production, and all have been intensified.

The college has selected 26 research stations, originally special district and hsien agricultural research institutes, as bases for operations and has sent representatives to these stations to get a clear understanding of their functions. The task of each station will be first and foremost, to study the crucial problems in local production, using modern agricultural science and technology to assist the peasants to summarize production experience, such as the role of tide-water irrigation in enriching the soil or the problem of converting low-yield fields ~~into~~ high-yield fields in hilly country. On the other hand, these experimental stations will be responsible for studying important problems that are of interest to the entire province, for example, research on color change in leaves and the theory of its relationship to high yields in paddy rice, which will be carried out at different localities in order to discover universal laws.

FORCASTING EPIDEMICS OF WHEAT STRIPE RUST -- Peiping, Chin-jih Hsin-wen,
17 Oct 62, p 2

The Hopeh branch of the Institute of Plant Protection, Academy of Agricultural Sciences, has found a method for predicting epidemics of wheat stripe rust in Hopeh Province. Wheat stripe rust is a disease which spreads very rapidly in Hopeh Province, and personnel of the Hopeh Institute of Plant protection began carrying on research on the forecasting of outbreaks of the disease as early as 1950. Besides visiting the various wheat-growing areas, they established more than 20 observation stations to help collect data. They gradually realized that outbreaks of the disease has a close relationship to the temperature, moisture, and amounts of the pathogenic bacteria in a given area.

On the basis of these discoveries, they found that they could predict the possibility of an epidemic in a given area according to the weather forecast for that area and assist in the preparation of the appropriate preventive measures. During the second [spring] quarter, by analyzing the numbers of bacteria and moisture conditions, they could make an even more accurate prediction of the extent of the epidemic and take further countermeasures.

TSINGHAI ACADEMY DEVELOPS KEY RESEARCH -- Peiping, Jen-Min Jih-pao,
9 Nov 62, p 2

By the end of October, the Tsinghai Provincial Academy of Agricultural and Forestry Sciences (Ch'ing-hai Sheng Nung-lin K'o-hsueh Yuan; 7230/3189/4164/6593/2651/4430/1331/7108) had completed 80 percent or more of its research tasks for the year. These research tasks included work in seed selection, crop husbandry, soil fertility, plant protection, horticulture, and forestry. Specifically, the selected and bred seed for wheat, barley, oil vegetable, potatoes, and beans, studied crop rotation plans for various agricultural areas in Tsinghai, the relationship between soil fertility and crop productivity, and improvement and utilization of saline land in the Tsaidam Basin, and searched for methods of preventing late potato blight and wheat rust.

Workers at the Institute of Crop Research (Tso-wu Yen-chiu So; 0155/3670/4282/4496/2076) tested Albanian A-p'o spring wheat in more than 60 locations and found it well suited to the Tsaidam Basin and some hsien in the eastern agricultural area.

SOCIETY OF TROPICAL CROPS ESTABLISHED ON HAI-NAN ISLAND -- Peiping, Kuang-ming Jih-pao, 12 Nov 62, p 2

The Hai-nan Administrative District Society of Tropical Crops (Hai-nan Ch'ia Je-tai Tso-wu Hsueh-hui; 3189/0589/0575/3583/1601/0155/3670/1331/2585) recently called its first congress at Hai-k'ou Municipality and announced

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the formal establishment of the society. At the same time, the society held its first conference at which more than 20 papers and reports were submitted. At the conference, Ho K'ang (0149/1660), director of the South China Sub-tropical Crops Research Institute, presented a report on domestic and foreign production and research on tropical crops.

LIAONING PROVINCE TRAINS AGRICULTURAL TECHNICIANS -- Peiping, Jen-min Jih-pao, 9 Nov 62, p 2

During the winter of 1962 1963, Liaoning province will strengthen the training of workers at its agricultural technology promotion stations and will raise their level of skill. They have decided to take advantage of the slack winter season to provide this training for most of the personnel at the stations. A class in food crop technology offered by the provincial agriculture department has already begun, and the 400 cadres participating will exchange experiences and make arrangements for next year's work. In addition to this, concerned departments of the province are offering correspondence instruction and are issuing various kinds of technical documents. Many municipalities and hsians are also holding special conferences to study the strengthening of the work of the agriculture technology promotion stations and to make plans for next year's work.

Since April 1962, general readjustments have been made at all of the 514 agriculture technology promotion stations in the province. Agriculture administrative departments, scientific-research organs, and vocational schools have detached more than 200 technical instructors and technicians to work at the stations. During 1962, a large part of the more than 700 graduating students at Mukden Agricultural College, the agricultural junior colleges at Hsiung-yueh and Chin-chou, and other schools were assigned to work as technicians at the stations. After the readjustment, the proportion of university- and junior-college-level personnel among the 3,356 agricultural technology promotion station workers in the province was raised from 4.5 percent to 15 percent, and the proportion of secondary-vocational-school-level personnel was raised from 51 percent to 55 percent. At many of the stations, outstanding technicians have been elevated to leading positions.

KWEICHOW RESEARCH DEPARTMENTS PROMOTE APPLICATION OF RESEARCH RESULTS -- Peiping, Jen-min Jih-pao, 9 Nov 62, p 2

Agricultural research departments in Kweichow Province recently provided a series of research results to state-operated farms, stations for the promotion of agricultural technology, and other units throughout the province and are preparing to institute large-area or regional experiments in places where conditions are suitable. There are a total of 38 of these research results, selected from the hundreds submitted by agricultural research units at provincial, special district, and hsien levels. Each of them has undergone repeated testing and small-area trials to prove its

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effectiveness. Two new strains of paddy rice, Nung-yu [agriculture bred] 1744, and Sian 175, which can be planted at key areas in the province's rich cultivated land, have been under development since 1956 by agriculture research institutes in various areas. In experimental planting over the past few years, Nung-yu 1744 has been shown to increase production by 2.8 percent to 54 percent. After more than 4 years' of investigation and experiment, young technicians at the Lo-tien Hsien Agriculture Experimental Station arrived at a method for preventing damage by the corn beetle which was tried this year in the principal corn-growing areas and was welcomed by the masses for its effectiveness in controlling insect damage.

MINISTRY OF AGRICULTURE IMPROVES QUALITY OF SCIENTIFIC FILMS -- Peiping, Kuang-ming Jih-pao, 8 Nov 62, p 2

In the past several years, the agricultural motion-picture company of the Ministry of Agriculture has produced more than 170 instruction films on agricultural sciences and has distributed more than 10,700 prints. These films are concerned with agriculture, forestry, animal husbandry, subsidiary production, fishing, etc. These films have been very useful in spreading scientific knowledge, promoting advanced experiences, and supplementing educational instruction. Since agricultural production has a great many peculiarities, it was found in the past that a film which summarizes the production experiences of a certain area is seldom useful in an area with different conditions. Therefore, subject matter is now selected on the basis of general, basic scientific knowledge. For instance, a film on how to use spraying equipment is of a general nature and will be useful for a long period of time, and so more than 110 prints of it were issued immediately upon its completion.

KIRIN SCIENTIFIC PERSONNEL POPULARIZE AGRICULTURAL KNOWLEDGE -- Peiping, Kuang-ming Jih-pao, 10 Nov 62, p 2

The Kirin Provincial Scientific and Technological Society has been active in the popularization of scientific and technological knowledge among the people. They have dispatched personnel to over ten people's communes to conduct discussions among the cadres, old farmers, agricultural and forestry technicians, and young people. In addition, over 200 pieces of literature have been prepared since last year; over 250,000 copies of these works have been distributed. They include handbooks on such subjects as preventing rice blast, multiple cropping techniques, hog raising, the use of agrochemicals, and the use of chemical fertilizers.

Scientific and technical personnel organized a team that visited the Pai-ch'eng, T'ung-hua, and Kirin areas to discuss experiences in raising hogs. Another example of their efforts is the class on plant protection being held in Shuang-liao Hsien, which is attended by over 100 plant protection cadres. Other classes are held in such subjects as tractor driving, chemical experiments, and animal and fowl management.

BIOLOGICAL AND MEDICAL SCIENCES

ELECTRONIC TECHNIQUES PROBE BRAIN ACTIVITY -- Peiping, Kuang-ming Jih-pao
11 Nov 62, p 2

The application of electronic techniques to probe human brain activity is a new research project of the Institute of Psychology, Chinese Academy of Sciences. After analyzing observations of brain waves (the electrical current issued by brain cells) by electronic instruments and studying the brain development of more than 1,800 children and youths between the ages of 4 and 20, they discovered that there are two periods of outstanding accelerated brain development: one is between the ages of 5 and 6; the other is between the ages of 13 and 14. At the same time, by analyzing their observations, they achieved a definite recognition of the characteristics of abnormal brain development and the degree of maturity of the brain at various ages. These research results are the fruit of 4 years of examinations. Among other things, they discovered that it is possible to determine the degree of mental retardation by means of their observations, and their observations tally in general with the clinical findings of hospitals. The institute has already begun observation and research on the brain wave activity of persons between the ages of 20 and 110. They are designing and constructing several electronic instruments for use in this work.

According to a researcher at the Institute of Psychology, there are still a great many undiscovered scientific secrets in the complex structure of the brain. At present, scientists of various countries are carrying out research in this field, especially in the area of the brains highly sensitive automatic regulating system. Man hopes to copy the brains automatic regulating abilities in the design of highly automatic control techniques. Up to the present, most international research on human brain waves has been directed at the brains of European people, but the present work of the Institute of Psychology is a systematic study of brain waves of Chinese people.

SHANGHAI HEALTH UNITS STUDY RICE PADDY DERMATITIS -- Peiping, Kuang-ming
Jih-pao, 11 Nov 62, p 2

The Shanghai Municipal Research Institute of Labor Health and Occupational Diseases (Shang-hai Shin Iao-tung Wei-sheng Chih-yeh Ping Yen-chiu So; 0006/3189/1579/0525/0520/5090/3932/5120/2814/4016/4282/4496/2076), the Shanghai First and Second Medical Colleges and other units have achieved some initial progress in the study and prevention of diseases which affect the health of peasants in the area around Shanghai, such as rice paddy dermatitis, vegetable and sunlight dermatitis, and insecticide poisoning.

Rice paddy dermatitis is a skin disease which frequently afflicts peasants during planting and harvesting. During the planting season, when the peasants' hands and feet are immersed in water, the skin becomes wrinkled and whitened,

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and in some cases, the skin erupts. At its most serious stage, the skin peels off, and the flesh is reduced to a pulp. Since those afflicted suffer intense pain, they are not able to work in the fields. In the course of their research, the health units found several medicines which helped to prevent this disease, and also discovered that alternating between dry and wet work was effective in preventing it.

Another common disease in the area around Shanghai is vegetable sunlight dermatitis. This generally occurs between March and May, and exposed portions of the skin develop dropsy, contusions, and water blisters, in some cases resulting in mortification of tissue. Since last year, units from the Shanghai Municipal Research Institute of Labor Health and Occupational diseases and the dermatology teaching and research sections of Shanghai First and Second Medical Colleges separately carried out investigation and research of more than 400 cases of the disease, and have found medicines with a degree of effectiveness against it.

With regard to research on methods of preventing poisoning by organo-phosphorous insecticides, First Shanghai Medical College and other units have collected a great deal of recent domestic and foreign data and material on the subject and have carried out experiments on acute poisoning of animals by three new types of insecticides. The Shanghai Municipal Health and Disease Prevention Station has organized concerned cadres to study the correct use of insecticide sprays and methods to prevent poisoning.

RAPID DEVELOPMENT AT YUNG-CH'UN HOSPITAL -- Canton, Chung-kuo Hsin-wen,
2 Nov 62, p 10

The Yung-ch'un hospital was established in 1888, financed by gifts from overseas Chinese, but developed very little in the 60 years before the liberation. In the period immediately after the liberation, there were less than 10 doctors, surgeons, and nurses on the staff. However, it has developed very rapidly with government support during the last 13 years, and there are now more than 100 staff members in nine departments and laboratories, including the department of internal medicine, the department of surgery, the department of traditional Chinese medicine, the department of obstetrics, the radiology laboratory, and the acupuncture and moxibustion laboratory. In addition, support by overseas Chinese has brought a great deal of new equipment, such as the X-ray equipment, a universal operating table, shadowless lights, an infant incubator, and a refrigerator.

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WUHAN HOSPITAL GIVES TECHNICAL SUPPORT TO HSIEN HOSPITALS -- Peiping, Kuang-ming Jih-pao, 12 Nov 62, p 1

Wuhan Municipal Hospital No 4 recently dispatched a group of medical personnel to the An-lu Hsien Hospital, Hupeh Province, in order that they might render this hospital technical assistance. This is the 12th time that this Wuhan hospital has sent personnel to outside villages since 1959. For quite some time, Wuhan Municipal Hospital No 4 has been working closely with the Huang-p'i and An-lu Hsien Hospitals in clinical and curative work as well as giving technical lecture. In the past three years, this Wuhan hospital has trained over 120 medical personnel in the hospitals of these two hsien. At present, over 95 percent of the patients at the hsien hospitals can be treated immediately, whereas, in the past, it was necessary to send many more serious cases to the Wuhan hospital for treatment. The hsien hospitals are now capable of handling fairly complex large and medium-scale surgery.

Liang Te-ming (2733/1795/2494), head of the Pediatric Department, Wuhan Municipal Hospital No 4, treated roundworms with "p'ai ch'in" [0656 + 0617 + 3044/4440; possibly "paludrin"], thus avoiding surgery. This took place in Huang-p'i Hsien, where roundworms are fairly prevalent among children. Chang Wen-chin (1728/0795/3160), assistant head of the Surgery Department, Wuhan Municipal Hospital No 4, has performed operations in conjunction with doctors of the An-lu Hsien Hospital.

KWEICHOW INSTITUTE PUBLISHES TRADITIONAL CHINESE MEDICINE WORK -- Peiping, Kuang-ming Jih-pao, 14 Nov 62, p 2

Kweichow Folk Medicine, a book compiled by researchers of the Kweichow Provincial Institute of Traditional Chinese Medicine (Kuei-chou Sheng Chung-i Yen-chiu So; 6311/1556/4164/0022/6829/4282/4496/2076), is based on the collection and definition of over 800 folk medicines. The battle waged over a long period against disease by the more than ten nationalities in Kweichow, including Han, Miao, Pu-i, T'ung, and Yi, has given them rich experience in the use of herbs to control disease. Some practitioners of folk medicine are knowledgeable of many kinds of herbs and are masters of proven secret formulas, most of which existed in oral tradition with the names of medicines and materials in a confused state. Since 1957, researchers have gone to 32 hsien, interviewed some 400 practitioners of traditional medicine and herbalists, and collected some 800 proven secret formulas for folk medicines and some 2,000 specimens of medicines. Investigations turned up such rare and valuable medical materials as Chu-chieh Ginseng and "Lo-pu San-ch'i" (vernacular names), both are types of Ginseng.

SURVEY OF SOUTH CHINA TROPICAL BIOLOGICAL RESOURCES COMPLETED -- Peiping, Kuang-ming Jih-pao, 12 Nov 62, p 1

A comprehensive survey of the tropical biological resources of South China, begun in 1950, has been successfully completed. The survey began with a study of Hainan Island; from 1952 to 1955 the survey concentrated on Kwangsi Province and western Kwangtung Province. In 1957, the Comprehensive Expeditions Committee, Chinese Academy of Sciences, established the South China Tropical Biological Resources Survey Team. The following organizations participated in the survey: the Institute of Geography, Chinese Academy of Sciences; the South-Central, Fukien, and Hopeh Institutes of Geography; the South China Institute of Botany; the Institute of Soils; the Institute of Forestry and Soils; Chung-shan University; Amoy University, the South China, Kwangsi, and Fukien Agricultural Colleges; the Kwangtung and Kwangsi Forestry Colleges; the South China, Kwangtung, and Kwangsi Normal Colleges; and the Departments (or Bureaus) of Land Reclamation, Agriculture, Forestry, and Meteorology of each of the Provinces (or districts) in South China.

The findings of the survey were reported in a 22 item report; the report covered such items as the geomorphology, climate, soils, vegetation, and natural regions of South China.

CHINESE WILD ANIMALS BECOMING MORE SCARCE -- Peiping, Chung-kuo Ch'ing-nien Pao, 20 Nov 62, p 4

The number of *Alces alces cameloides* (mine-Edwards) and "tiao-hsiung" [6285/3574; literally, "sable bear"] of the Greater Khingan Range; of *Castor fiber birulai* Serebrennikov of the Sinkiang A-erh Shan; and of wild elephants, "t'a-hou" [3758/3729; literally, "otter monkey"], *Hylobates hoolock* (Harlan), and *Pavo muticus* Linne of southern Yunnan Province are steadily decreasing.

The following ought not be hunted at any time in any place: *Vespertilio murinus superanas* Thomas, any species of *Strigiformes*, any species of *Cuculiformes*, any species of *Apus*, any species of *Muscicapa*, any species of *Sylvia*, the *Oriolus chinensis diffusus* Sharpe, or any species of *Sturnus*.

The "Mei-hua lu" (2734/5363/7773; literally, "plum-blossom deer"), once widely distributed in China, is now found only in the Ch'ang-api Shan, Kirin Province and in the Huang Shan, Anwei Province.

BIRDS NOTED IN TSINGHAI LAKE -- Peiping, Kuang-ming Jih-pao, 5 Jun 62, p 2

Hai-hsi Shan, an island in Tsinghai Lake, is heavily populated with birds during the month of June. The species inhabiting the island include: *Ardea garzetta* Linne, the "pan-t'ou yen" [2432/7333/7159; literally, "striped-head goose"], the "tsung t'ou ou" [2762/7333/7743; literally, "palm-head gull"], *Larus canus heinei* Homeyer, "kuan ya" [0385/7700; literally, "hooded duck"], "huang ya" [7806/7700; literally, "yellow duck"], *Balearica pavonina*, and the *Alauda arvensis* Linne.

PINE CATERPILLAR STUDIED IN HUNAN -- Peiping, Kuang-ming Jih-pao, 13 Nov 62, p 2

P'eng Chien-wen (1756/1696/2429), a research worker in the Pine Caterpillar Laboratory, Hunan Provincial Institute of Forestry, has been studying the pine caterpillar so as to devise means whereby its ravages may be controlled. P'eng and his associates have made extensive studies of the natural enemies of the pine caterpillar; attempts are now being made to propropagate these parasitic species. P'eng and his fellow workers are also considering the introduction of microorganisms foreign to the area that will combat the pine caterpillar.

P'eng has been studying the pine caterpillar since 1953, at which time he began work for the Disease and Pest Prevention Station, Hunan Provincial Department of Agriculture and Forestry; he had just graduated from Ch'ang-sha Agricultural School at that time.

TECHNICAL SCIENCES

CARBURIZATION STUDIED AT CHIAO-T'UNG UNIVERSITY -- Peiping, Kuang-ming Jih-pao, 7 Nov 62, p 2

Prof Chou Hui-chiu (0719/1920/0036), head of the Machinery Department, Chiao-t'ung University, lecturer Huan Ming-chih (7806/2494/1807), Metallography Teaching and Research Section, Machinery Department, Chiao-t'ung University, and Chang Chia-wei (1728/1367/3555), a graduate student, along with other instructors and graduate students, have been conducting research on carburization for the past few years. The recent research grows out of past studies by professor Chou and lecturer Huang on the mechanical properties of metallic materials under multiple and continuous shock. The use of the low-energy multiple and continuous shock testing method was suggested by Professor Chou as a substitute for the high-energy single [pendulum] bob shock testing method after Chou's return from studies abroad, where he had developed doubts about the appropriateness of the latter method.

Fifty three year old Professor Chou and his colleagues have studied the problem of carburization using the multiple and continuous shock method and they decided to increase the carbon content of the core from 0.12-0.2 percent to 0.25-0.3 percent, a development of great practical significance to engineering.

At present, Professor Chou and his colleagues are engaged in research on increasing the lifetime of the three gear bit used in petroleum drilling; working in conjunction with Chiao-t'ung University in this project are the Lanchow Research Institute of Petroleum Machinery (Lan-chow Shih-yu Chi-hsieh Yen-chiu So; 5695/1558/4258/3111/2894/2750/4282/4496/2076) and the Shanghai Petroleum Machinery Parts Factory (Shang-hai Shih-yu Chi-hsieh P'ei-chien Ch'ang; 0006/3189/4258/3111/2894/2750/6792/0115/1681). Other units cooperating in this research include the Research Institute of Electrical Machinery, Harbin Industrial University (Ha-erh-pin Kung Ta Tien-chi Yen-chiu So; 0761/1422/6333/1562/1129/7193/2894/4282/4496/2076); the Shanghai Research Institute of Materials, [Chinese] Research Academy of Machinery (Chi-hsieh K'o-hsueh Yen-chiu Yuan Shang-hai Ts'ai-liao Yen-chiu So; 2894/2750/4430/1331/4282/4496/7108/0006/3189/2624/2436/4282/4496/2076); the T'ai-yuan Heavy Machinery Plant (T'ai-yuan Chung-hsing Chih-shieh Ch'ang; 1132/0626/6850/0992/2894/2750/1681); the Shanghai Diesel Plant (Shang-hai Ch'ai-yu-chi Ch'ang; 0006/3189/2693/3111/3894/1681); and the Wu-hsi diesel plants (Wu-hsi Ch'ai-yu-chi Ch'ang; 2477/6932/2693/3111/3894/1681).

Professor Chou, commenting upon his group's achievements in research, pointed out that scientific research need not wait upon the acquisition of complex equipment. In this, the professor's statement was in accord with the recent pronouncement of Vice-President Wu Yu-hsun (0702/2589/6064), [Chinese] Academy of Sciences, to the effect that some of the best research results came through the use of simple equipment.

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METALLOGRAPHIC RESEARCH CARRIED OUT AT CHIAO-T'UNG UNIVERSITY -- Peiping, Kuang-ming Jih-pao, 7 Nov 62, p 2

Since 1958, the Metallography Teaching and Research Section, Machinery Department, Chiao-t'ung University, has brought several research projects to successful conclusions and has improved the quality of its instruction.

One of the areas in which research has been conducted is the use of low-energy multiple and continuous shock testing. Experiments conducted in this teaching and research section have shown that the previously used high-energy single [pendulum] bob shock test is unsatisfactory; selection of properties of materials to be used under normal dynamic loads according to the results of this latter type test is unsatisfactory because the conditions obtaining under the high-energy single shock test differ from the low-energy multiple and continuous shock conditions obtaining during operation of machinery.

Other topics of research on which progress has been made include the properties of large broken surfaces of nodular graphite cast iron and corrosion-resistant steel iron-aluminum systems. This teaching and research section and the Metallography Teaching and Research Section of the Shanghai Chiao-t'ung [University] compiled the first part of a text for higher schools entitled Chin-shu Chi-hsieh Hsing-neng (The Mechanical Properties of Metals).

Most of the instructors of the Teaching and Research Section are engaged in research. Lecturer Yu Te-kang (0205/1795/0474) is studying mesothermal phase transformations. Lecturer Wang Hsiao-t'ien (3769/4562/1131) has studied several types of alloys in connection with his course on alloy steels. Lecturer Huang Ming-chih (7806/2494/1807) has been engaged for several years on research on the mechanical properties of metals. Four instructors of the Mechanical Properties of Metals Teaching Group were relieved of their lecturing responsibilities by the teaching and research section in order that they might conduct research on this subject. Since 1957, Lecturer Wang Hsiao-t'ung (3765/1420/0681) has been studying the abrasion of nodular graphite cast iron. Instructor Shih Te-k'o (4258/1795/3784) a metallography lecturer, and instructor Liu Yu-men (0491/4416/7024) a specialist in X-ray metallography, have been working together on their research projects. Liu Yu-men has modified an X-ray camera in order to photograph internal metal structure.

NATIONAL RADIO ENGINEERING COMPETITION HELD IN PEIPING -- Peiping, Jen-min Jih-pao, 6 Nov 62, p 5

The 1962 National Radio Engineering Competition opened in Peiping on 5 November. The judging committee, composed of radio specialists and technicians, has already begun their appraisal of almost 500 entries. Most of the entries were built in spare time by radio fans from all parts of the

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country. There are many types of equipment, such as radio surveying instruments, various types of radio transmitting and receiving equipment, radio facsimile, television, and radio remote control, remote measurement, and automatic equipment.

The judging committee has separated the entries into 12 judging classes on the basis of their various uses. Each entry is awarded points according to its electrical capability, level of technology, construction and components, useful value, and cost. Depending upon the number of points earned, they are awarded special class, first class, second class, or third class.

The largest number of entries from a single place, more than 120, came from Peiping. Following this were Szechwan, Shensi, and Kirin, with about 60 entries each. Many of the entries were made by young people. For instance, an automatic tuning receiver from Peiping was built by three young students during the summervacation. The station tuning, volume, and tone of this set can all be regulated by means of voice commands, timer, or wired control.

Although radio engineering and construction activities have developed in various areas of China since 1952, this is the first national competition. The completion will close on 20 November, and the entries will be on display for a period following that.

LIAONING SOCIETY OF METALS HOLDS ANNUAL CONFERENCE Peiping, Kuang-ming Jih-pao, 13 Nov 62, p 1

The Liaoning Provincial Society of Metals held its annual conference in Anshan from 25 October 1962 to 1 November 1962. The conference was divided into nine specialized groups: ore extraction, ore dressing, coking, refractory materials, iron smelting, steel smelting, pressure processing, nonferrous metals, and analytical inspection.

Reports were given on the techniques used in Anshan for the past three years in the production of rolled steel, the correct distribution of flow of coal gas in blast furnaces, and other subjects of nationwide interest. Ch'iu Chu-hsien (8003/4554/6343), Northeast Engineering College, presented a paper, "Economizing on Electric Power During the Electrolysis of Aluminum." Ch'en Hsing-pan (7115/5281/0086-0584), Anshan Central Steel Laboratory (An Kang Chung-yang Shih-yen-shih; 7254/6921/0022/1135/6107/7526/1358), reported on "Rapid, Automatic Determination of Carbon in Iron and Steel and a New Gradation for Carbon Content." Kuo Shu-ts'ai (6753/2885/2088), Dairen Engineering College, submitted a paper, "Heat Transfer of Coal in Coking Furnaces and the Coking Period." In this paper, Kuo presents a formula for the calculation of coking time and suggests that the figure relating coking time to furnace width is 1.57.

Many valuable papers were presented on the contributions of metallurgy and metallurgical technology to agriculture. For example, the Anshan [Central] Steel [Laboratory] offered a paper, "Improved Pass Design for Plough and shovel Steel," designed to improve the quality of the steel. Wang Ch'eng-han (3769/2052/3352), Mukden Foundry (Shen-yang Yeh-lien-ch'ang; 3088/7122/0396/3550/0617), presented a paper entitled "Fume Damage and Its Rectification." Hsieh Yu (6200/6877), Liaoning Provincial Institute of Metallurgy, submitted a research report titled "Four Hydrogenated 'Huang-yao' (7806/5673; Yellow [Sulfur?] Compounds') Substitutes." Finally, the Anshan Design Academy of Coking and Refractory [Materials] (An-shan Chiao-hua Nai-huo She-chi Yen-chiu Yuan; 7254/6921/3542/0553/5082/3499/6080/6060/4282/4496/7108) reported on the production of ammonium chloride by a coking plant.

KIANGSU HYDRAULIC ENGINEERING SOCIETY HOLDS CONFERENCE -- Peiping, Kuang-ming Jih-pao, 12 Nov 62, p 2

The Kiangsu branch of the Hydraulic Engineering Society of China, the East China hydraulic Engineering College, and the Nanking Research Institute of Hydraulic Engineering (Shui-li K'o-hsueh yen-chiu So; 3055/0448/4430/1331/4282/4496/2076) recently held a joint conference. At the conference, separate groups simultaneously discussed hydrology, hydropower and water conservation, hydroengineering and hydrodynamics, earth work, river channels and harbors, materials and structures, and architectural mechanics. A total of 47 papers and reports were submitted. Of these, ten were directly concerned with agricultural production.

The four papers reported to the hydrology group were all closely concerned with flood prevention, irrigation, electric power generation, and hydrology calculations. A paper reported to the hydropower and water conservation group, titled "Problems in Determining Stage Height in Comprehensive Utilization Systems Involving Irrigation and Power Generation," suggests reasonable heights for each stage in the development of medium and small rivers, and will be useful as a guide in the future utilization of water resources. At the meeting of the river channel and harbor group, there were two reports on the problem of sedimentation on the downstream side of tidal locks. These reports analyzed the various causes of this sedimentation, and suggested a method for calculating the amount of floating sediment on the downstream side of the lock. They also proposed a plan for the management of the lock gate. This research result has already been applied, and has not only solved the sedimentation problem at the lock gate which was the subject of the study, but has also showed possibilities for more general application.

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The larger proportion of the papers presented at the conference were concerned with research on the basic theory of hydraulic engineering and actual problems in hydraulic engineering construction. In the field of basic theory, there were papers on "Development of Similar Theories", "Several Basic Theoretical Problems of Modern Soil Mechanics," "Possible Directions for the Development of Theoretical Mechanics", "Summary of Methods for Calculating the Fundamental Beam", and "Theory of Starting Movement in Mud and Sand". This latter paper is the result of many years of experiment and research, and provides important guidance for present work in controlling mud and sand. In the field of actual problems in hydraulic engineering construction, there were reports on "An Investigation of Corrosion of Reinforced Concrete Docks in Shanghai Harbor" "Problems Calculating Flow of Aerated Water," and "A Model Frame for Ship Lifting Machinery and Calculation Methods".

This conference lasted from 28 October to 2 November. It was attended by scientists and technicians from more than 20 higher level schools, scientific research organs and production departments.

SILICATES SOCIETY HOLDS CONFERENCE ON GLASS -- Peiping, Kuang-ming Jih-pao,
9 Nov 62, p 2

The special committee on glass of the Chinese Society of Silicates held its first conference recently in Nanking. The conference received a total of 64 papers on the physical chemistry of glass, heat treatment and furnaces, testing technology, and testing of new products. On the basis of the problems of present and future development of glass specialties, the central topics of discussions at the conference were the physical and chemical properties of glass and heat treatment furnaces. The 16 representative papers read at the conference were discussed by separate groups.

The medium and small scale furnaces used by the Chinese glass industry are of many different types and show great differences in efficiency. In discussing the problem of selecting types of furnaces to be used in the future, delegates agree that the types of furnace should be determined by a great many factors, such as type of product, quality, fuel to be employed, refractory materials, the plant building, and the operational skills. The conference selected the best models of several types of furnaces, and especially recommended the type of heat exchanger tank furnace which has been successfully tested in recent years.

At present both round and square coal gas furnaces are in use in various areas. The square type is technologically backward, but it can vaporize some powdered coal. The round type has good technical qualities, but it can vaporize only lump coal, and is not suited to China's present circumstances. It was noted that the thermal efficiency of the standard brick heat exchanger which is widely used in many areas is very low, and the use of the tube type heat exchanger should be promoted.

There was wide interest in a paper on the utilization of changes in the density of the glass for purposes of controlling the production quality, and it was felt that this could establish a more scientific basic for production control.

KWANGSI PRODUCES LARGE GROUPS OF MINORITY NATIONALITY TECHNICIANS -- Canton,
Chung-kuo Hsin-wen, 30 Oct 62, p 10

At present there are in Kwangsi Province 6,868 specialized technician cadres of such nationalities as Chuang, Moslem, Miao, Yao, T'ung, Mao-nan, and others, an increase of 5.8 times since 1954. They are responsible technicians, agricultural technicians, engineers, general engineers, doctors, teachers, etc., in industry, agriculture, forestry, commerce, hospitals, and higher schools. Most of them have been trained since the liberation by universities and specialized schools. Chuang and Moslem technician cadres were few in number in the early post-liberation period; in 1954 there were only 844; now there are more than 5,000. After the

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liberation, there was not a doctor or a nurse among the Miao, Yao, T'ung, Mao-nan, and others. Now there are not only doctors and nurses but also various grades of technicians in industry, agriculture, forestry, and various other fields.

TELEVISION PHOTOGRAPHY PRACTICE AT PEKING BROADCASTING COLLEGE -- Peiping, Kuang-ming Jih-pao, 12 Nov 62, p 2

Students in the television photograph specialty of the News Department at Peking Broadcasting College (Pei-ching Kuang-po Hsueh-yuan; 0554/0079/1684/2330/1331/7108) recently practiced photographing a television film as a requirement for their course in "Photographic Arts". In accordance with the plan for the course, they made 13 films on parks, memorials, and other points of interest. When they had completed the photography, they composed commentaries on the basis of data they gathered in visiting the various places.

EARTH SCIENCES

STRUCTURE OF SUBTROPICAL HIGHS STUDIES -- Peiping, Ch'i-hsiang Hsueh-pao (Acta Meteorologica Sinica), Vol 31, No 4, Jan 62, pp 339-369

[The following is a translation of a Chinese-language abstract, supplemented with additional material from the text, of an article, "On the Structure of the Subtropical Highs and Some Associated Aspects of the General Circulation of the Atmosphere," by Huang Shih-sung (7806/1102/2646) and Yu Chih-hao (151/1807/6275), both of the Meteorology Department, Nanking University. According to a footnote, Wang Te-han (3769/1795/3466) and Lin Yuan-pi (2651/0337/1732) participated in some of the earlier work reported in the paper; Chiang Jung-cheng (3068/5554/2973), Chu Chin-t'ang (2612/6855/1016), and Wang Yueh-fang (3769/1471/5364), along with over ten fourth-year students (1959-1960) in the Department of Meteorology, including Wang Pi-k'uei (3769/1801/7608), Li Shu-fang (2621/3359/5364), Sun I-wen (1327/3015/2429), and Wang Shui (3769/3055), participated in the graphing and calculating work; Kan Hung-fu (3927/3163/1381) and Tsou Pang-yen (6760/6721/1750) assisted with the graphics; the paper was submitted for publication 22 August 1961.]

The many new structural characteristics of subtropical highs reported in this paper indicate that the structure of subtropical highs is far more complicated than the model ordinarily used would indicate. These characteristics were noted during a detailed study of the Western Pacific subtropical highs in the northern hemisphere during the period 15-23 August 1959 and from 5-day mean meridional cross sections for May-August 1958. The structure of the subtropical highs is complex not only because each cell differs from other cells but also because each part of each cell shows dissimilarities.

Subtropical highs, far from being purely dynamic systems, are importantly affected during the cell development and maintenance by thermal factors this is especially true of continental cells.

The paper's discussion of the atmosphere above the northern and southern sides of the Tibetan plateau during the winter months reveals that the two branches of the westerly jet stream are not due to forced bifurcation by the plateau. Finally, the paper discusses the existence of countercirculation and the relationship between subtropical highs, on the one hand, and convective and advective circulation, on the other.

SECULAR VARIATIONS IN ATMOSPHERIC ACTIVITY STUDIES -- Peiping, Ch'i-hsiang Hsueh-pao (Acta Meteorologica Sinica), Vol 31, No 4, Jan 62, pp 303-317

[The following is a translation of a Chinese-language abstract appearing in an article, "Secular Variation of Centers of Atmospheric Activity," by Wang Shao-wu (3769/4801/2976), Peiping University. This article is said to have been received for publication 10 August 1961. The author acknowledges the assistance of Hsiao Wen-chun (5135/2429/ 0193) in the preparation of the graphs appearing in the article.]

In this article, the annual mid and low latitude positions of the centers of atmospheric activity are determined by means of graphs plotting the January and July atmospheric pressure at sea level in the northern and southern hemispheres during 1873-1934. The secular variations in these positions were analyzed by means of a 10-year sliding mean. Their correlation with world climatic oscillations was studied; the variations were also compared with the 22-year cycle of solar activity. The important results are as follows:

(1) The secular variation in the position of activity centers in January and in July have differing characteristics.

(2) The secular variation in centers of atmospheric activity show definite periodicity; a 22-year cycle and a 35-year cycle are most evident, a century-long cycle (80-90 years) may also exist.

(3) The climatic oscillations in many regions of the earth were found to be explicable by the secular variations in the centers of atmospheric activity. Most significantly, it was found that the east-west swing in the position of the centers of activity was equal to or greater than the north-south swing.

(4) The secular variation in the position of the centers of atmospheric activity are closely correlated with the 22-year cycle of solar activity; this correlation is most evident in the Pacific Ocean region during the summer. The Pacific Ocean may therefore be considered a key region for the influence of solar activity on the troposphere.

SECULAR TEMPERATURE VARIATION IN CHINA STUDIED -- Peiping, Ch'i-hsiang Hsueh-pao (Acta Meteorologica Sinica), Vol 31, No 4, Jan 62, pp 360-370

[The following is a translation of a Chinese-language abstract appearing in an article, "The Characteristics of Temperature Variation in China in the Past 50 years," by Yang Chien-ch'u (2799/7003/0443), Institute of Geophysics, Chinese Academy of Sciences. According to a footnote, this paper was received for publication 16 October 1961]

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This paper reports the use of monthly temperature charts of China during the period 1909-1958 in the analysis of secular temperature variation in China. The monthly temperatures in China were classified into five ranks: cold, warm, slightly cold, slightly warm, and normal. The climatic variation of these five ranks of monthly temperature in China were tabulated. From an analysis of the data, the authors found that the secular variation of warm and cold months in China was definitely correlated with the periodic variations in solar activity. It was also found that, after a cold or a warm period of 1-3 months, the probability of the reoccurrence of the same trend of temperature in the following 6 months will be greater than that of the opposite trend of monthly temperature.

RESEARCH CONDUCTED ON THE CLIMATE OF NANKING -- Peiping, Ch'i-hsiang Hsueh-pao (Acta Meteorologica Sinica), Vol 31, No 4, Jan 62, pp 328-338

[The following is a translation of a Chinese-language abstract appearing in an article, "Climatic Characteristics of the Free Atmosphere of Nanking," by Tsou Chin-shang (6760/6651/0006), Chang Yu-lien (1728/2589/6647), and Yang Chung-ch'iu (2799/0022/4428), all of the Meteorology Department, Nanking University. The authors acknowledge the help of Shih Tsung-hsiang (4258/1350/4382), who drew the graphs used in the article. According to a footnote, this paper was received for publication 22 August 1961.]

This paper presents the seasonal climatic characteristics of Nanking, and examines the distribution of various meteorological factors in the free atmosphere of Nanking as based on atmospheric meteorological data for the period 1954-1959. This paper presents a harmonic analysis of the mean temperature and relative humidity at various altitudes below 600 millibar (mb). The results clearly show that the phase lag of annual temperature variation is not obviously dependent upon altitude; the phase lag, however, of the annual variation in relative humidity is fairly evidently dependent upon altitude. The paper further points out that the vertical temperature gradient during the summer is greater than that during the winter, particularly during the period of June to August in the 1-4 kilometer layer where $\bar{\gamma} > \gamma_w$. Also noted is the fact that this layer is highly unstable and convection clouds tend to develop during this period.

The annual temperature differential tends to diminish with height, except in the mid troposphere where there is a slight increase with altitude. The mean relative humidity was found to decrease exponentially with increasing altitude, and more rapidly in the summer than in the winter. The annual relative humidity differential falls rapidly with increasing altitude; the annual differential at 500 mb is not more than 1/6 of the annual differential at 1,000 mb; the annual differential at 500 mb is not greater than 1/27 of that at 1,000 mb. Aperiodic, daily temperature changes at various altitudes were studied, as was the temperature distribution frequency during the various seasons.

A comprehensive analysis was also made of the distribution of the comparative temperatures, cloud amounts, rainfall, and wind during each year and their seasonal variation.

INFLUENCES BETWEEN STRATOSPHERE AND TROPOSPHERE EXAMINED -- Peiping, . . .
Ch'i-hsiang Hsueh-pao (Acta Meteorologica Sinica), Vol 31, No 4, Jan 62,
pp 319-327

[The following is a translation of a Chinese-language abstract appearing in an article, "The Vertical Influences of Dynamic Disturbances Between the Stratosphere and Troposphere," by Ch'en Hsiung-shan (7115/7160/1472), Institute of Geophysics, Chinese Academy of Sciences. The author acknowledges the help of Yeh Tu-cheng (5509/4648/2973) and Ku Chen-ch'ao (7357/7201/3390); and also of Hsueh Ping-chan (5641/3056/4232), who did all the computations. According to a footnote, this paper was received for publication 11 August 1961.]

In this paper, an equation for vertical velocity was derived from a vorticity equation and a thermodynamic equation; the equation was solved for the conditions of stratospheric activity. The results showed that the stratospheric sources of long wave lengths had an appreciable influence on the troposphere; the stratospheric sources of short wave lengths, however, have little effect. The effects of the tropospheric sources of long wave lengths have a greater effect on the stratosphere than the stratosphere's own sources; the effects of the tropospheric sources of short wave lengths and the stratosphere's own sources have about the same effect.

CHEMISTRY AND CHEMICAL TECHNOLOGY

PEIPING UNIVERSITY IMPROVES CHEMISTRY COURSE -- Peiping, Kuang-ming
Jih-pao, 14 Nov 62, p 1

The Inorganic Chemistry Laboratory of Peiping University's Chemistry Department is continuously improving its classroom and laboratory teaching, strengthening the student's basic technical training, and paying attention to the individual's work capacity and scientific working style.

Inorganic chemistry is the first basic chemistry course for first year students of the chemistry department. To improve this course, the laboratory has used a great deal of effort to improve classroom lectures and clearly explain fundamental concepts. This semester the teachers drew charts and planned experiments that could be demonstrated in the classroom to help students grasp certain fundamental concepts. In explaining Gay-Lussac's law of volumes concerning the combination of gasses, for example, they coordinated demonstration and experiment, and the students observed the changes in volumes. The teachers and laboratory personnel are sure of results in these classroom demonstrations because they usually repeat the exercise six or seven times beforehand.

Laboratory classes, an important part of the inorganic chemistry course, takes up about 60 percent of the total class time. This semester laboratory teachers, in their first lectures, concentrated on a systematic introduction to basic procedural methods, such as cleaning apparatus, etc. The laboratory summarized teacher experience of the past few years and compiled a set of experiment reference cards.

Each card gives the complete procedure for one experiment: objective basic principle, etc. The teacher directs the student to follow the requirements and aims stated on the card. Laboratory personnel make ready the apparatus and materials as indicated by the card. The card also tells what safety measures should be taken and gives directions regarding the content and problem answer of the laboratory report. In the time spent before class, the student reads a pre-exercise report, works out mathematical problems, and asks questions of the teachers.

STUDY ON PERIODIC FUNCTIONS -- Peiping, Scientia Sinica, Vol 11,
No 11, Nov 62, pp 1455-1474

[The following is a full translation of the Russian-language article, "On the Best Approximation of Periodic Differential Functions by Trigonometric Polynomials," written by Sun Yung-sheng (1327/3057/3932) of Peiping Normal University. The article was received for publication on 28 June 1962.]

1. Introduction

This paper is a continuation of the author's previous works [1,2]. S. B. Stechkin introduced in [1] a study of the class of the functions $W^r(\alpha)$ and posed the problem of finding the best approximation for this class by trigonometric polynomials. He solved the problem for the conditions $0 < r < 1$, $r \leq \alpha \leq 2 - r$. In [1] and [2] the author obtained a complete solution for the case when $r > 1$ and α is any substantial number. In this paper we shall solve the problem under the conditions $0 < \alpha < r \leq 1$.

We shall say that the function $f(x)$ belongs to the class $W^r(\alpha)$, if it is represented in the form

$$f(x) = \frac{a_0}{2} + \frac{1}{\pi} \int_0^{2\pi} \Psi_{n,\alpha}(t-x) \varphi(t) dt, \quad (1.1)$$

where

$$\Psi_{n,\alpha}(t) = \sum_{k=1}^n k^{-r} \cos\left(kt - \frac{\pi\alpha}{2}\right), \quad (1.2)$$

$r > 0$, α is any fixed substantial number, and $\varphi(t)$ satisfies the following conditions:

$$\operatorname{ess\,sup}_{0 \leq t < 2\pi} |\varphi(t)| \leq 1, \quad \int_0^{2\pi} \varphi(t) dt = 0. \quad (1.3)$$

$T_{n-1}(x)$ shall denote the trigonometric polynomial of the order $\leq n-1$,

and
$$E_n(f) = \min_{T_{n-1}} \max_x |f(x) - T_{n-1}(x)|, \quad n = 1, 2, \dots \quad (1.4)$$

We shall use all symbols and definitions, introduced in works [1] and [2].

Theorem 1. Let $f(x) \in W^{(\nu)}(a)$, $0 < x < r \leq 1$. Then

$$\sup_{f \in W^{(\nu)}(a)} E_n(f) = \sup_{\substack{f \in W^{(\nu)}(a) \\ |x=r-a}} \|f\|_r = \min_{T_{n-1}} \frac{1}{\pi} \int_0^{2\pi} |\Psi_{n,\nu}(t) - T_{n-1}(t)| dt = \quad (1.5)$$

where
$$= \frac{4}{\pi} \cdot \frac{K_{n,\nu}}{n^{\nu}}, \quad n = 1, 2, 3, \dots$$

$$K_{n,\nu} = \left| \sum_{\nu=0}^n \frac{\sin \left[(2\nu+1)\beta\pi - \frac{\pi\alpha}{2} \right]}{(2\nu+1)^{\nu+1}} \right|, \quad (1.6)$$

$\frac{1}{2} < \beta < 1$, and $\beta\pi$ is the root of the equation:

$$H(\beta\pi) = \sum_{\nu=0}^n \frac{\cos \left[(2\nu+1)\beta\pi - \frac{\pi\alpha}{2} \right]}{(2\nu+1)^{\nu}} = 0. \quad (1.7)$$

The case $0 < r \leq 1, 2 - r < \alpha < 2$ is easily applied to the former.

Namely, there takes place

Theorem 1'. Let $f(x) \in W^{(\nu)}(a)$, $0 < r \leq 1, 2 - r < \alpha < 2$, Then

$$\begin{aligned} \sup_{f \in W^{(\nu)}(a)} E_n(f) &= \sup_{\substack{f \in W^{(\nu)}(a) \\ |x=r-a}} \|f\|_r = \min_{T_{n-1}} \frac{1}{\pi} \int_0^{2\pi} |\Psi_{n,\nu}(t) - T_{n-1}(t)| dt = \\ &= \frac{4}{\pi} \frac{K_{n,\nu}}{n^{\nu}}, \quad n = 1, 2, 3, \dots, \end{aligned} \quad (1.8)$$

where

$$K_{n,\nu} = \left| \sum_{\nu=0}^n \frac{\sin \left[(2\nu+1)\beta\pi - \frac{\pi\alpha}{2} \right]}{(2\nu+1)^{\nu+1}} \right|, \quad (1.9)$$

$0 < \beta < \frac{1}{2}$, and $\beta\pi$ is the root of the equation (1.7).

From Theorem 1' it follows that, for the class of functions $\tilde{W}^{(\nu)}$

when $\frac{1}{2} < r < 1$ (cf [3/]), there takes place

Theorem 2. Let $f(x) \in \tilde{W}^{(\nu)}$, $\frac{1}{2} < r < 1$, i.e., $f(x) = \frac{1}{\pi} \int_0^{2\pi} R_n(t-x)\varphi(t)dt$,

where $\tilde{K}_n(x) = \sum_{k=1}^{\infty} k^{-r} \sin\left(kx + \frac{\pi r}{2}\right)$, $\int_0^{2\pi} \varphi(x) dx = 0$, $\operatorname{ess\,sup}_{0 \leq x < 2\pi} |\varphi(x)| \leq 1$. Then

$$\sup_{\substack{f \in \mathcal{B}(\nu) \\ \|f\|_{r-1} = 1}} E_n(f) = \sup_{\substack{f \in \mathcal{B}(\nu) \\ \|f\|_{r-1} = 1}} \|f\|_r = \min_{r-1} \frac{1}{\pi} \int_0^{2\pi} |K_n(x) - T_{n-1}(x)| dx = \frac{4}{\pi} \frac{K_{n,r+1}}{n^r}, \quad n = 1, 2, 3, \dots \quad (1.10)$$

where

$$K_{n,r+1} = \left| \sum_{\nu=0}^n \frac{\cos\left[(2\nu+1)\beta\pi - \frac{\pi r}{2}\right]}{(2\nu+1)^{r+1}} \right|, \quad (1.11)$$

$0 < \beta < \frac{1}{2}$, and $\beta\pi$ is the root of the equation:

$$H(\beta\pi) = \sum_{\nu=0}^n \frac{\sin\left[(2\nu+1)\beta\pi - \frac{\pi r}{2}\right]}{(2\nu+1)^r} = 0. \quad (1.12)$$

2. Preliminary Discussion of the Function $\mathcal{W}_{n,r}(x)$

1°. Let $0 < \alpha < r < 1$. It is known (cf. [4], p. 186) that when $t \rightarrow 0+$, the following asymptotic equalities take place:

$$\sum_{k=1}^{\infty} k^{-r} \cos kt \approx t^{-1} \Gamma(1-r) \sin \frac{\pi r}{2}, \quad (2.1)$$

$$\sum_{k=1}^{\infty} k^{-r} \sin kt \approx t^{-1} \Gamma(1-r) \cos \frac{\pi r}{2}. \quad (2.2)$$

The following lemma relates to the remaining members in these formulae. Proof of it is elementary, but quite voluminous. We shall omit it.

Lemma 1. Let $0 < \alpha < r < 1$, $0 < t < 2\pi$. Then

$$\mathcal{W}_{n,r}(t) = \frac{\Gamma(1-r) \sin \frac{\pi}{2}(r+\alpha)}{t^{1-r}} + A_1(t) + A_2(t) + A_3(t), \quad (2.3)$$

where

$$A_1(t) = \begin{cases} 0, & \text{when } 0 < t < \pi, \\ \frac{\Gamma(1-r) \sin \frac{\pi}{2}(r-\alpha)}{(2\pi-t)^{1-r}} - \frac{\Gamma(1-r) \sin \frac{\pi}{2}(r+\alpha)}{t^{1-r}} + \frac{2 \cos \frac{\pi r}{2} \sin \frac{\pi \alpha}{2} \Gamma(1-r)}{\pi^{1-r}}, & \text{when } \pi \leq t < 2\pi, \end{cases}$$

when $\pi \leq t < 2\pi$,

$$A_2(t) = \frac{2\Gamma(1-r) \cos \frac{\pi \alpha}{2} \sin \frac{\pi r}{2}}{\pi} g(t); \quad g(t) \text{ is a function, continuous at the}$$

period $0 \leq t \leq 2\pi$, monotonically increasing at the segment $0 \leq t \leq \pi$, and satisfying the condition $g(2\pi - t) = g(t)$.

$A_1(r) = \frac{2\Gamma(1-r) \sin \frac{\pi\alpha}{2} \cos \frac{\pi r}{2}}{\pi} h^*(r) + C_{r,\alpha}$, $h^*(r)$ is a function, continuous and monotonically decreasing at the period $0 \leq t \leq 2\pi$, and satisfying the condition $h^*(\pi + t) = -h^*(\pi - t)$.

The following equality also takes place:

$$\Psi_{r,\alpha}(s) = \frac{\Gamma(1-r) \sin \frac{\pi(r-\alpha)}{2}}{(2\pi-s)^{1-r}} + A_1^*(s) + A_2(s) + A_3^*(s), \quad (2.4)$$

where

$$A_1^*(s) = \begin{cases} \frac{\Gamma(1-r) \sin \frac{\pi(r+\alpha)}{2}}{s^{1-r}} - \frac{\Gamma(1-r) \sin \frac{\pi(r-\alpha)}{2}}{(2\pi-s)^{1-r}} - \frac{2\Gamma(1-r) \cos \frac{\pi r}{2} \sin \frac{\pi\alpha}{2}}{\pi^{1-r}} & \text{npu } 0 < s < \pi, \\ 0 & \text{npu } \pi \leq s < 2\pi. \end{cases}$$

$$A_3^*(s) = \frac{2\Gamma(1-r) \sin \frac{\pi\alpha}{2} \cos \frac{\pi r}{2}}{\pi} h^*(s) + C_{r,\alpha}^*$$

In (2.3) and (2.4) $C_{r,\alpha}$ and $C_{r,\alpha}^*$ are constant numbers, depending on r and α .

2°. Assume that $H(s) = \sum_{\nu=0}^{\infty} \frac{\cos \left[(2\nu+1)s - \frac{\pi\alpha}{2} \right]}{(2\nu+1)^r}$, where $0 < \alpha < r \leq 1$.

There takes place

Lemma 2. There exists a unique number β , such that $\frac{1}{2} < \beta < 1$ and $H(\beta\pi) = 0$.

Proof. First consider the case $0 < r < 1$. Assume that $\Phi(s) = \sum_{\nu=0}^{\infty} \frac{\cos(2\nu+1)s}{(2\nu+1)^r}$, $\chi(s) = \sum_{\nu=0}^{\infty} \frac{\sin(2\nu+1)s}{(2\nu+1)^r}$.

According to one theorem by Fejer [5], we know that $\Phi(t) \downarrow$ in the interval $(0, \pi)$, and also $\Phi(t) \geq 0$ when $0 < t \leq \frac{\pi}{2}$ and $\chi(t) > 0$ when $0 < t < \pi$.

Let us prove that $\chi(t)$ decreases monotonically in the interval $(0, \pi)$.

With this aim, we apply Abel's transformation. We obtain

$$2 \sin t \cdot X(t) = \sum_{\nu=0}^{\infty} \left\{ \frac{1}{(2\nu+1)^r} - \frac{1}{(2\nu+3)^r} \right\} [1 - \cos(2\nu+2)t].$$

Hence, it follows that $2 \sin t \cdot X'(t) + 2 \cos t \cdot X(t) =$

$$\begin{aligned} &= \sum_{\nu=0}^{\infty} (2\nu+2) \cdot \Delta \frac{1}{(2\nu+1)^r} \cdot \sin(2\nu+2)t = \\ &= \sum_{\nu=0}^{\infty} \{ (2\nu+1)^{1-r} - (2\nu+3)^{1-r} \} \sin(2\nu+2)t + \\ &+ \sum_{\nu=0}^{\infty} \left\{ \frac{1}{(2\nu+1)^r} + \frac{1}{(2\nu+3)^r} \right\} \sin(2\nu+2)t. \end{aligned}$$

Keeping in mind that

$$2 \cos t X(t) = \sum_{\nu=0}^{\infty} \frac{1}{(2\nu+1)^r} [\sin(2\nu+2)t + \sin 2\nu t],$$

we obtain $2 \sin t X'(t) = \sum_{\nu=0}^{\infty} \{ (2\nu+1)^{1-r} - (2\nu+3)^{1-r} \} \sin(2\nu+2)t.$

The sequence $\{ (2\nu+3)^{1-r} - (2\nu+1)^{1-r} \}$ is at least twice the monotonically decreasing zero-sequence. Then, on the basis of this same theorem by Fejer /5/, we can assert that $X'(t) < 0$ when $0 < t < \frac{\pi}{2}$. This means that $X(t) \downarrow$ in the interval $(0, \frac{\pi}{2})$. In view of $X(\pi-t) = X(t)$ we obtain $X(t) \uparrow$ when $\frac{\pi}{2} < t < \pi$.

Now it is easy to complete the proof of the first part of our lemma.

Namely, $H(t) > 0$ when $0 < t \leq \frac{\pi}{2}$, but $H(\frac{\pi}{2}) > 0$, $H(\pi-0) = \frac{1}{2} \{ \psi_{r,r}(\pi-0) - \psi_{r,r}(2\pi-0) \} < 0$,

Therefore, in the interval $(\frac{1}{2}, 1)$ there exists one number β such that

$H(\beta\pi) = 0$. The uniqueness of such a number β ensues from the fact that when

$\frac{\pi}{2} < t < \pi$ there takes place $\Phi(t) \downarrow$ and $X(t) \uparrow$.

It remains for us to consider the case $r = 1$. In this case

$$\Phi(t) = \frac{1}{2} \ln \operatorname{ctg} \frac{t}{2} \quad 0 < t < \pi$$

$$X(t) = \frac{\pi}{4} \operatorname{sign} \sin t \quad 0 < t < 2\pi.$$

Then it is easy to obtain the required result with the aid of these elementary expressions. The lemma is completely proven.

Corollary. Let $0 < \alpha < r \leq 1$. Then $H(t) = \text{sign} \sin(\beta\pi - t)$.

(2.5)

Proof. / This fact ensues directly from the proven lemma and from the fact that $H(t + \pi) = -H(t)$ for all t .

3°. The interpolated trigonometric polynomial of the function $\varphi_{n,\alpha}(t)$.

Let us now proceed to construct the interpolated trigonometric polynomial $n-1$ of the order for $\varphi_{n,\alpha}(t)$. For the interpolation junctions we shall take the following $2n$ points at the period:

$$t_1 = \frac{\beta\pi}{n}, \quad t_2 = \frac{\pi}{n} + \frac{\beta\pi}{n}, \quad \dots, \quad t_{2n} = \frac{2n-1}{n}\pi + \frac{\beta\pi}{n}.$$

According to one theorem by M. G. Crane [6], we can assert that there

exists the trigonometric polynomial $U_{n-1}^*(t)$ of the order $n-1$, such that

$$U_{n-1}^*(t_k) = \varphi_{n,\alpha}(t_k), \quad k = 1, 2, \dots, 2n.$$

Analogous to what was done in [1] and [7], it is possible to establish that

$$\varphi_{n,\alpha}(t) - U_{n-1}^*(t) = -2 \sin(n\pi - \beta\pi) W_n(t), \quad (2.6)$$

where

$$W_n(t) = \frac{1}{2} \sum_{\nu=0}^{n-1} \frac{\sin \left[(2\nu+1)\beta\pi - \frac{\pi\alpha}{2} \right]}{(2\nu+1)^{\nu n}} + \sum_{j=1}^{n-1} \sum_{\nu=0}^{n-1} \frac{\sin \left[(2\nu+1)\beta\pi - \frac{\pi\alpha}{2} + j\pi \right]}{[(2\nu+1)n + j]^{\nu n}}, \quad n = 1, 2, 3, \dots \quad (2.7)$$

We shall not prove the last equality. Let us merely note that the trigonometric series on the right side of (2.7) enters into the interval $(0, 2\pi)$ for

all natural n . Thus, the sequences $\left\{ \sum_{\nu=0}^{\infty} \frac{\sin(2\nu+1)\beta\pi}{[(2\nu+1)n + j]^{\nu n}} \right\}, \left\{ \sum_{\nu=0}^{\infty} \frac{\cos(2\nu+1)\beta\pi}{[(2\nu+1)n + j]^{\nu n}} \right\}$

$j = 0, 1, 2, \dots$, where for each fixed n there are monotonically decreasing zero-sequences.

Further examination of our problem consists of investigating the

functions $W_n(t)$ in the period. The following paragraph will establish that when $0 < \alpha < r \leq 1$ for all n at the period $0 \leq t \leq 2\pi$, there takes place

$$W_n(t) > 0.$$

3. Examination of the Functions $W_n(t)$

Lemma 3. There exist sufficiently large numbers $n_1 > 0, K_1 > 0$ such that for all $n > n_1$ there takes place $W_n(t) > 0$ $n\pi \frac{K_1}{n} \leq t \leq 2\pi - \frac{K_1}{n}$.

The proof of this lemma does not differ from the proof of Lemma 5 in the source /1/.

Lemma 4. Let $K_2 > 0$ be any given positive number, and $\alpha |k| \leq K_2$. Then

$$\lim_{n \rightarrow \infty} 4n^{r+1} \sin^2\left(\frac{k}{2n}\right) W_n\left(\frac{k}{n}\right) = W(k) \quad (3.1)$$

takes place uniformly at the segment $|k| \leq K_2$, where

$$W(k) = r \left\{ \sum_{\nu=0}^{\infty} \frac{\sin\left[(2\nu+1)\beta\pi - \frac{\pi\alpha}{2}\right]}{(2\nu+1)^{r+1}} - (r+1) \times \int_0^{+\infty} \sum_{\nu=0}^{\infty} \frac{\sin\left[(2\nu+1)\beta\pi - \frac{\pi\alpha}{2} + k u\right]}{(2\nu+1+u)^{r+1}} du \right\}. \quad (3.2)$$

Proof. Assume that

$$d_j^{(n)} = \sum_{\nu=0}^{\infty} \frac{\sin\left[(2\nu+1)\beta\pi - \frac{\pi\alpha}{2}\right]}{[(2\nu+1)n + j]^r}$$

$$\bar{d}_j^{(n)} = \sum_{\nu=0}^{\infty} \frac{\cos\left[(2\nu+1)\beta\pi - \frac{\pi\alpha}{2}\right]}{[(2\nu+1)n + j]^r} \quad \begin{matrix} n = 1, 2, 3, \dots \\ j = 0, 1, 2, \dots \end{matrix}$$

Applying the Abel transformation twice to (2.7), we obtain

$$4 \sin^2 \frac{t}{2} W_n(t) = \sum_{j=0}^{\infty} \Delta^2 d_j^{(n)} - \left\{ \sum_{j=0}^{\infty} \Delta^2 d_j^{(n)} \cos(j+1)t + \sum_{j=0}^{\infty} \Delta^2 \bar{d}_j^{(n)} \sin(j+1)t \right\}. \quad (3.3)$$

We note that

$$\sum_{j=0}^{\infty} \Delta^j j^{\nu} = \frac{r}{n^{\nu+1}} \sum_{j=0}^{\infty} \frac{\sin \left[(2\nu+1)\beta\pi - \frac{\pi\alpha}{2} \right]}{(2\nu+1)^{\nu+1}} + o\left(\frac{1}{n^{\nu+1}}\right),$$

$$\Delta^{\nu} j^{\nu} = \sum_{j=0}^{\infty} \Delta^j \frac{1}{[(2\nu+1)n+j]^r} \sin \left[(2\nu+1)\beta\pi - \frac{\pi\alpha}{2} \right],$$

$$\Delta^{\nu} j^{\nu} = \sum_{j=0}^{\infty} \Delta^j \frac{1}{[(2\nu+1)n+j]^r} \cos \left[(2\nu+1)\beta\pi - \frac{\pi\alpha}{2} \right],$$

$$n = 1, 2, 3, \dots, \quad j = 0, 1, \dots$$

And on the basis of the aforementioned theorem by Fejer, we have

$$\sum_{j=0}^{\infty} \Delta^j \frac{1}{[(2\nu+1)n+j]^r} \sin(2\nu+1)\beta\pi > 0,$$

$$\sum_{j=0}^{\infty} \Delta^j \frac{1}{[(2\nu+1)n+j]^r} \cos(2\nu+1)\beta\pi < 0,$$

$n = 1, 2, 3, \dots, j = 0, 1, 2, \dots$. Then for any natural number N and any t , there takes place:

$$\left| \sum_{j=N+1}^{\infty} \cos(j+1)t \sum_{j=0}^{\infty} \Delta^j \frac{1}{[(2\nu+1)n+j]^r} \sin(2\nu+1)\beta\pi \right| < \\ < \sum_{j=N+1}^{\infty} \sum_{j=0}^{\infty} \Delta^j \frac{1}{[(2\nu+1)n+j]^r} \sin(2\nu+1)\beta\pi.$$

Considering that

$$\sum_{j=0}^{\infty} \Delta^j \frac{1}{[(2\nu+1)n+j]^r} \sin(2\nu+1)\beta\pi = \\ = \frac{1}{\sin \beta\pi} \sum_{j=0}^{\infty} \Delta_j \Delta^j \frac{1}{[(2\nu+1)n+j]^r} \sin^2(\nu+1)\beta\pi < \\ < \frac{1}{\sin \beta\pi} \sum_{j=0}^{\infty} \Delta_j \Delta^j \frac{1}{[(2\nu+1)n+j]^r} = \\ = \frac{1}{\sin \beta\pi} \Delta^j \frac{1}{(n+j)^r},$$

$$\text{we have } \left| \sum_{j=N+1}^{\infty} \cos(j+1)t \sum_{j=0}^{\infty} \Delta^j \frac{1}{[(2\nu+1)n+j]^r} \sin(2\nu+1)\beta\pi \right| <$$

$$\leq \frac{1}{\sin \beta\pi} \sum_{j=N+1}^{\infty} \Delta^j \frac{1}{(n+j)^r} = \\ = \frac{r}{(nN)^{r+1} \sin \beta\pi} + o\left(\frac{1}{n^{r+2} N^{r+2}}\right).$$

$$\text{By analogy, we can obtain } \left| \sum_{j=N+1}^{\infty} \cos(j+1)t \sum_{j=0}^{\infty} \Delta^j \frac{1}{[(2\nu+1)n+j]^r} \cos(2\nu+1)\beta\pi \right| = \\ = \frac{r}{(nN)^{r+1} \sin \beta\pi} + o\left(\frac{1}{n^{r+2} N^{r+2}}\right).$$

$$\begin{aligned}
 & n^{r+1} \sum_{j=0}^{N-n} \sum_{v=0}^n \frac{r(r+1)}{[(2v+1)n+j]^{r+2}} \sin \left[(2v+1)\beta\pi - \frac{\pi\alpha}{2} + k \left(\frac{j+1}{n} \right) \right] - \\
 & - \frac{1}{n} \sum_{j=0}^{N-n} \sum_{v=0}^n \frac{r(r+1)}{(2v+1+\frac{j+1}{n})^{r+2}} \sin \left[(2v+1)\beta\pi - \frac{\pi\alpha}{2} + k \left(\frac{j+1}{n} \right) \right] + \\
 & + o\left(\frac{1}{n}\right) = \\
 & = r(r+1) \int_0^N \sum_{v=0}^n \frac{\sin \left[(2v+1)\beta\pi - \frac{\pi\alpha}{2} + ku \right]}{(2v+1+u)^{r+2}} du + o\left(\frac{1}{n}\right),
 \end{aligned} \tag{3.7}$$

where $\left| o\left(\frac{1}{n}\right) \right| < \frac{M^r}{n}$, and M^r is a constant, independent of n . By combining (3.4) - (3.7), we obtain

$$\begin{aligned}
 & 4n^{r+1} \sin^2 \left(\frac{k}{2n} \right) W_n \left(\frac{k}{n} \right) - W(k) = \\
 & = -r(r+1) \int_N^\infty \sum_{v=0}^n \frac{\sin \left[(2v+1)\beta\pi - \frac{\pi\alpha}{2} + ku \right]}{(2v+1+u)^{r+2}} du + \\
 & + o\left(\frac{1}{n}\right) + o\left(\frac{1}{N^{r+1}}\right).
 \end{aligned}$$

Taking into consideration that

$$\int_N^\infty \sum_{v=0}^n \frac{\sin \left[(2v+1)\beta\pi - \frac{\pi\alpha}{2} + ku \right]}{(2v+1+u)^{r+2}} du = o\left(\frac{1}{N^{r+1}}\right)$$

uniformly relatively k , we have

$$4n^{r+1} \sin^2 \left(\frac{k}{2n} \right) W_n \left(\frac{k}{n} \right) - W(k) = o\left(\frac{1}{n}\right) + o\left(\frac{1}{N^{r+1}}\right),$$

whence there immediately follows (3.1). The lemma is proven.

Lemma 5. $W(k) > 0$ when $k \neq 0$, and $W(0) = 0$.

Proof. Integrating along the parts, we have

$$\begin{aligned}
 & - (r+1) \int_0^\infty \sum_{v=0}^n \frac{\sin \left[(2v+1)\beta\pi - \frac{\pi\alpha}{2} + ku \right]}{(2v+1+u)^{r+2}} du = \\
 & = - \sum_{v=0}^n \frac{\sin \left[(2v+1)\beta\pi - \frac{\pi\alpha}{2} \right]}{(2v+1)^{r+1}}
 \end{aligned}$$

$$-k \int_0^{\infty} \sum_{\nu=0}^{\infty} \frac{\cos \left[(2\nu + 1)\beta\pi - \frac{\pi\alpha}{2} + k u \right]}{(2\nu + 1 + u)^{r+1}} du.$$

Hence, we obtain

$$W(k) = -rk \int_0^{\infty} \sum_{\nu=0}^{\infty} \frac{\cos \left[(2\nu + 1)\beta\pi - \frac{\pi\alpha}{2} + k u \right]}{(2\nu + 1 + u)^{r+1}} du.$$

Assume that $k > 0$. Then

$$\begin{aligned} & \int_0^{\infty} \sum_{\nu=0}^{\infty} \frac{\cos \left[(2\nu + 1)\beta\pi - \frac{\pi\alpha}{2} + k u \right]}{(2\nu + 1 + u)^{r+1}} du = \\ &= \sum_{\nu=0}^{\infty} \int_0^{\infty} \frac{\cos \left[(2\nu + 1)\beta\pi - \frac{\pi\alpha}{2} + k u \right]}{(2\nu + 1 + u)^{r+1}} du = \\ &= \sum_{\nu=0}^{\infty} \frac{k^r}{(2\nu + 1)^r} \int_0^{\infty} \frac{\cos \left[(2\nu + 1)(\beta\pi + u) - \frac{\pi\alpha}{2} \right]}{(u + k)^{r+1}} du = \\ &= k^r \int_0^{\infty} \frac{1}{(u + k)^{r+1}} \sum_{\nu=0}^{\infty} \frac{\cos \left[(2\nu + 1)(\beta\pi + u) - \frac{\pi\alpha}{2} \right]}{(2\nu + 1)^r} du = \\ &= k^r \int_0^{\infty} \frac{H(\beta\pi + u)}{(u + k)^{r+1}} du = k^r \int_0^{\infty} H(\beta\pi + u) G(u) du, \end{aligned}$$

where we used that fact, that

$$H(u + \pi) = -H(u),$$

and also the following equation

$$G(u) = \sum_{r=0}^{\infty} \frac{(-1)^r}{(\beta\pi + u + |k|)^{r+1}} \quad k \neq 0.$$

Thus, we obtain

$$W(k) = -rk^{r+1} \int_0^{\infty} H(\beta\pi + u) G(u) du \quad \text{when } k > 0.$$

By analogy, we may obtain

$$W(k) = r|k|^{r+1} \int_0^{\infty} H(\beta\pi - u) G(u) du, \quad \text{when } k < 0.$$

On the basis of the corollary to Lemma 2, we are convinced that $W(k) > 0$

when $k \neq 0$. The equality $W(0) = 0$ is obvious. The lemma is proven.

Lemma 6. For any two given numbers $0 < \delta < K$, there exists a sufficiently large number $n_3 > 0$, such that when $n > n_3$ there takes place $W_n\left(\frac{k}{n}\right) > 0$ where $\delta < |k| \leq K$.

Lemma 7. Let $0 < \alpha < r < 1$. Then the following asymptotic equalities

take place:

1°. When $0 < nt \leq \delta$, $\delta \rightarrow 0$.

$$W_n(t) = \frac{\Gamma(1-r) \sin \frac{\pi}{2}(r+\alpha)}{2 \sin \beta\pi} \{t^{-r}[1+o(1)]\}, \quad (3.8)$$

2°. When $t < 0$, $0 < |nt| \leq \delta'$, $\delta' \rightarrow 0$

$$W_n(t) = \frac{\Gamma(1-r) \sin \frac{\pi}{2}(r-\alpha)}{2 \sin \beta\pi} \{|t|^{-r}[1+o(1)]\}. \quad (3.9)$$

In both expressions, the magnitudes $o(1)$ tend to zero, uniformly relative to all sufficiently large natural numbers and where δ (correspondingly δ') tends to zero.

Proof. In Lemma 1, it was established that

$$W_n(t) = \frac{\Gamma(1-r) \sin \frac{\pi}{2}(r+\alpha)}{t^{1-r}} + A_1(t) + A_2(t) + A_3(t). \quad (2.3)$$

Assume that $0 < nt \leq \delta$, where $0 < \delta < \frac{1}{2} \beta\pi$. Let us take $\{t_1, \dots, t_n\}$ for interpolation functions and, for each of these functions standing on the right side of (2.3), construct an interpolated trigonometric polynomial of the order $n-1$ at these points. Let these polynomials be $T_{n-1}(t)$, $T_{n-1}^{(1)}(t)$, $T_{n-1}^{(2)}(t)$, $T_{n-1}^{(3)}(t)$, which interpolate, respectively, $\{t^{-r}, A_1(t), A_2(t), A_3(t)\}$.

Obviously, we have

$$U_{n-1}^{(0)}(t) = \Gamma(1-r) \sin \frac{\pi}{2}(r+\alpha) \cdot T_{n-1}(t) + \sum_{i=1}^3 T_{n-1}^{(i)}(t).$$

Then we obtain

$$W_n(t) = \Gamma(1-r) \sin \frac{\pi}{2}(r+\alpha) \left\{ \frac{t^{-r} - T_{n-1}(t)}{2 \sin(\beta\pi - nt)} \right\} + \sum_{i=1}^3 \frac{A_i(t) - T_{n-1}^{(i)}(t)}{2 \sin(\beta\pi - nt)}. \quad (3.10)$$

By virtue of $0 < nt \leq \delta$, $0 < \delta < \frac{1}{2} \beta\pi$ we have

$$\frac{1}{2 \sin(\beta\pi - nt)} = O(1). \quad (3.11)$$

Besides, taking into consideration the expressions of the functions $A_i(t)$,

given in Lemma 1, we have

$$\frac{A_i(t)}{2 \sin(\beta\pi - nt)} = O(1), \quad i = 1, 2, 3. \quad (3.12)$$

Let us now prove that

$$\frac{T_{n-1}(t)}{2 \sin(\beta\pi - nt)} = O(n^{1-r}) \quad (3.13)$$

$$\frac{T_{n-1}^{(1)}(t)}{2 \sin(\beta\pi - nt)} = O(n^{1-r}), \quad (3.14)$$

$$\frac{T_{n-1}^{(2)}(t)}{2 \sin(\beta\pi - nt)} = O(1), \quad (3.15)$$

$$\frac{T_{n-1}^{(3)}(t)}{2 \sin(\beta\pi - nt)} = O(1) \quad (3.16)$$

take place uniformly relatively to all sufficiently large n when $0 < nt \leq \delta_1$.

To obtain a value in (3.13) - (3.16), following V. K. Dzyadyk in source /7/,

we apply the interpolated formula by M. Riesz, to which it is possible

to write $T_{n-1}(t)$ in the following form:

$$T_{n-1}(t) = \frac{\sin(nt - \beta\pi)}{2n} \sum_{k=1}^{2n} (-1)^k T_{n-1}(t_k) \operatorname{ctg} \frac{t - t_k}{2}.$$

Noting that $T_{n-1}(t_k) = t_k^{r-1}$ when $k = 2, 3, \dots, 2n$, and also $\sum_{k=1}^{2n} (-1)^k \times$

$\dots \times T_{n-1}(t_k) = 0$, we have $T_{n-1}(t) = \sum_{k=1}^{2n} (-1)^k t_k^{r-1}$.

Therefore, $\frac{T_{n-1}(t)}{2 \sin(nt - \beta\pi)} = \frac{1}{4n} \left\{ T_{n-1}(t_1) \operatorname{ctg} \frac{t - t_1}{2} + \sum_{k=2}^{2n} (-1)^k t_k^{r-1} \operatorname{ctg} \frac{t - t_k}{2} \right\}$.

$$|T_{n-1}(t_1)| = \left| \sum_{k=2}^{2n} (-1)^k t_k^{r-1} \right| < t_1^{r-1}.$$

Further, considering that $t_k^{r-1} \operatorname{ctg} \frac{t_k - t}{2} \downarrow$, $k = 2, 3, \dots, n$, we have

$$\begin{aligned} & \left| \sum_{k=1}^n (-1)^k t_k^{r-1} \operatorname{ctg} \frac{t - t_k}{2} \right| < t_2^{r-1} \operatorname{ctg} \frac{t_2 - t}{2} < t_1^{r-1} \operatorname{ctg} \frac{t_1 - t}{2}, \\ & \left| \sum_{k=n+1}^{2n} (-1)^k t_k^{r-1} \operatorname{ctg} \frac{t - t_k}{2} \right| = \left| \sum_{s=1}^n (-1)^s t_{n+s}^{r-1} \operatorname{tg} \frac{t - t_s}{2} \right| = \\ & = \left| \frac{1}{n^{1-r}} \sum_{s=1}^n (-1)^s \operatorname{tg} \frac{t - t_s}{2} - \sum_{s=1}^n (-1)^s \left\{ \frac{1}{n^{1-r}} - t_{n+s}^{r-1} \right\} \operatorname{tg} \frac{t - t_s}{2} \right|. \end{aligned}$$

But $0 < \frac{1}{n^{1-r}} - t_{n+s}^{r-1} \uparrow$, $s = 1, 2, \dots, n$, $0 < \operatorname{tg} \frac{t - t_s}{2} \uparrow$, $(1 \leq s \leq n)$

Thus

$$\begin{aligned} \left| \sum_{k=n+1}^m (-1)^k t_k^{-1} \operatorname{ctg} \frac{t_k - t}{2} \right| &\leq \frac{1}{n^{1-r}} \left| \sum_{k=1}^n (-1)^k \operatorname{tg} \frac{t_k - t}{2} \right| + \\ &+ \left| \sum_{k=1}^n (-1)^k \left\{ \frac{1}{n^{1-r}} - t_k^{-1} \right\} \operatorname{tg} \frac{t_k - t}{2} \right| \leq \\ &\leq \frac{1}{n^{1-r}} \operatorname{tg} \frac{t_n - t}{2} + \left(\frac{1}{n^{1-r}} - t_n^{-1} \right) \operatorname{tg} \frac{t_n - t}{2} < \frac{2}{n^{1-r}} \operatorname{tg} \frac{t_n - t}{2} = \\ &= O \left(\operatorname{tg} \frac{t_n - t}{2} \right) = O \left(\operatorname{ctg} \frac{t_1 - t}{2} \right). \end{aligned}$$

Thus we obtain

$$\begin{aligned} \left| \frac{T_{n-1}(t)}{2 \sin(n\pi - \beta\pi)} \right| &\leq \frac{1}{4n} \left\{ 2t_1^{-1} \operatorname{ctg} \frac{t_1 - t}{2} + O \left(\operatorname{ctg} \frac{t_1 - t}{2} \right) \right\} = \\ &= \frac{1}{2n} O \left(t_1^{-1} \operatorname{ctg} \frac{t_1 - t}{2} \right) = O(t_1^{-1}) = O(n^{1-r}). \end{aligned}$$

(3.13) is proven.

Proceed to the proof of (3.14). In considering that $T_{n-1}^{(1)}(t_k) = A_1(t_k) = 0$

when $k = 2, 3, \dots, n$, we obtain

$$\begin{aligned} \frac{T_{n-1}^{(1)}(t)}{2 \sin(n\pi - \beta\pi)} &= \frac{-1}{4n} \left\{ T_{n-1}^{(1)}(t_1) \operatorname{ctg} \frac{t_1 - t}{2} + \right. \\ &\left. + \sum_{k=2}^n (-1)^k T_{n-1}^{(1)}(t_k) \operatorname{ctg} \frac{t_k - t}{2} \right\}, \end{aligned}$$

where $T_{n-1}^{(1)}(t_k) = \sum_{k=n+1}^m (-1)^k A_1(t_k)$. In view of the fact that $A_1(t) \uparrow, \gg 0$ where $n < t < 2\pi$, we have

$$|T_{n-1}^{(1)}(t_k)| \leq A_1(t_k) = O(n^{1-r}),$$

$$\begin{aligned} \left| \sum_{k=n+1}^m (-1)^k A_1(t_k) \operatorname{ctg} \frac{t_k - t}{2} \right| &\leq A_1(t_m) \cdot \operatorname{tg} \frac{t_n - t}{2} = \\ &= O \left(n^{1-r} \operatorname{ctg} \frac{t_1 - t}{2} \right). \end{aligned}$$

Thus,

$$\left| \frac{T_{n-1}^{(1)}(t)}{2 \sin(\beta\pi - n\pi)} \right| \leq \frac{1}{4n} O \left(n^{1-r} \operatorname{ctg} \frac{t_1 - t}{2} \right) = O(n^{1-r}).$$

It remains to prove (3.15) and (3.16). They are proven by analogy,

Let us prove (3.15), for example:

$$\frac{T_{n-1}^{(2)}(t)}{2 \sin(n\pi - \beta\pi)} = \frac{-1}{4n} \left\{ T_{n-1}^{(2)}(t_1) \operatorname{ctg} \frac{t_1 - t}{2} + \right.$$

$$\left. + \sum_{k=2}^n (-1)^k A_2(t_k) \operatorname{ctg} \frac{t_k - t}{2} \right\}.$$

$$+ \sum_{k=n+1}^{\infty} (-1)^k A_2(t_k) \operatorname{ctg} \frac{t-t_k}{2} \Big\}.$$

The function $A_2(t)$ is continuous at the period $0 \leq t \leq 2\pi$. Moreover, $A_2(t) \uparrow$ where $0 \leq t \leq \pi$ and $A_2(t) \downarrow$ where $\pi \leq t \leq 2\pi$. Therefore

$$|T_{n-1}^{(n)}(t)| = O(1),$$

$$\left| \sum_{k=1}^n (-1)^k A_2(t_k) \operatorname{ctg} \frac{t-t_k}{2} \right| = O\left(\operatorname{ctg} \frac{t_1-t}{2}\right),$$

$$\left| \sum_{k=n+1}^{\infty} (-1)^k A_2(t_k) \operatorname{ctg} \frac{t-t_k}{2} \right| = O\left(\operatorname{ctg} \frac{t_n-t}{2}\right) = O\left(\operatorname{ctg} \frac{t_1-t}{2}\right).$$

Hence, it follows that

$$\left| \frac{T_{n-1}^{(n)}(t)}{2 \sin(n\pi - \beta\pi)} \right| = O\left(\frac{1}{n} \operatorname{ctg} \frac{t_1-t}{2}\right) = O(1).$$

(3.15) is proven. (3.16) is proven by analogy. On the basis of (3.13) - (3.16)

$$\begin{aligned} \text{we have } W_n(t) &= \frac{\Gamma(1-r) \sin \frac{\pi}{2}(r+\alpha)}{2 \sin(\beta\pi - n\pi)} \cdot t^{r-1} + O(n^{1-r}) = \\ &= \frac{\Gamma(1-r) \sin \frac{\pi}{2}(r+\alpha)}{2 \sin(\beta\pi - n\pi)} \{t^{r-1} + O(n^{1-r})\} = \\ &= \frac{\Gamma(1-r) \sin \frac{\pi}{2}(r+\alpha)}{2 \sin \beta\pi} \{t^{r-1} + O(n^{1-r})\} + \\ &\quad + \frac{\Gamma(1-r) \sin \frac{\pi}{2}(r+\alpha)}{4 \sin \beta\pi \sin(\beta\pi - n\pi)} \cdot 2 \cos\left(\beta\pi - \frac{n\pi}{2}\right) \sin \frac{n\pi}{2} \{t^{r-1} + O(n^{1-r})\} = \\ &= \frac{\Gamma(1-r) \sin \frac{\pi}{2}(r+\alpha)}{2 \sin \beta\pi} \{t^{r-1} + O(n^{1-r})\} + O(\delta_1 \cdot t^{r-1}) + O(\delta_1 \cdot n^{1-r}) = \\ &= \frac{\Gamma(1-r) \sin \frac{\pi}{2}(r+\alpha)}{2 \sin \beta\pi} \{t^{r-1} [1 + o(1)]\}, \end{aligned}$$

where δ_1 is a magnitude tending to zero uniformly relatively n where δ_1 tends to zero. Thus, (3.8) is established. By analogy, it is possible to establish formula (3.9) with the aid of (2.4).

Lemma 8. Let $0 < \alpha < r < 1$. Then there exists a sufficiently large number $n_5 > 0$, such that when $n > n_5$ there takes place $W_n(t) > 0$ $0 \leq t \leq 2\pi$.

The proof is easily obtained on the basis of Lemmas 3, 5 and 6.

For the functions $W_n(t)$, the following lemma takes place.

Lemma 9. For any two natural m and N

$$W_m(t) = \frac{1}{(2N)^{1-\alpha}} \sum_{s=0}^{2N-1} W_{2Nm} \left(\frac{t}{2N} + \frac{2s\pi}{N} \right), \quad 0 \leq t \leq 2\pi.$$

This identity was first established by V. K. Dzyadyk, under the conditions $0 < \alpha = r < 1/7$. In general, it also takes place so that it is possible to prove it directly.

With the aid of Lemmas 8 and 9, it is easy to prove the following lemma.

Lemma 10. Let $0 < \alpha < r < 1$. Then, for every natural n

$$W_n(t) > 0 \quad \text{при} \quad 0 \leq t \leq 2\pi.$$

It remains to examine the case of $0 < \alpha < r = 1$, for which it is possible to establish the following lemma.

Lemma 11. Let $\Psi_{1,\alpha}(t) = \sum_{k=1}^n k^{-1} \cos\left(k t - \frac{\pi \alpha}{2}\right)$, where α is any substantial number. Then, for any trigonometric polynomial $T_{n-1}(t)$ of an order not higher than $n-1$, the function $\Psi_{1,\alpha}(t) - T_{n-1}(t)$ in the interval $(0, 2\pi)$ has no more than $2n$ zeros (whereby each multiple root is calculated as many times as there are units in its multiplicity).

The proof may be done by analogy to that done by N. I. Akhiezer in /9/, where $\alpha = 0, 1$. We shall omit that.

As a corollary of Lemma 11, we obtain that

$$\text{sgn} \{ \Psi_{1,\alpha}(t) - U_{n-1}^*(t) \} = \varepsilon_n \text{sgn} \sin(n t - \beta \pi),$$

where $|\varepsilon_n| = 1$. Moreover, it is evident from Lemmas 3 and 9 that $\varepsilon_n = -1$ for all natural n .

4. Proof of Theorems 1, 1' and 2

Proof of Theorem 1. According to one theorem by S. M. Nikol'skiy

[10], we have

$$\begin{aligned} \sup_{\{\epsilon \in W^{(r)}(\epsilon)\}} E_n(f) &= \sup_{\substack{\{\epsilon \in W^{(r)}(\epsilon)\} \\ |L|_{n-1}} \|f\|_L = \frac{1}{\pi} E_n[\Psi_{r,n}(\epsilon)]_L = \\ &= \frac{1}{\pi} \int_0^{2\pi} |\Psi_{r,n}(\epsilon) - U_{n-1}^*(\epsilon)| d\epsilon = \\ &= \frac{1}{\pi} \left| \int_0^{2\pi} \{\Psi_{r,n}(\epsilon) - U_{n-1}^*(\epsilon)\} \operatorname{sign} \sin(n\epsilon - \beta\pi) d\epsilon \right| = \\ &= \frac{4}{\pi} \frac{K_{r,n}}{n^r}, \quad n = 1, 2, 3, \dots \end{aligned}$$

Theorem 1 is proven.

Proof of Theorem 1' easily leads to proof of Theorem 1. In fact, let $0 < r \leq 1$, $2 - r < \alpha < 2$, assuming $\alpha' = 2 - \alpha$. Then $0 < \alpha' < r \leq 1$

and $\Psi_{r,n}(\epsilon) = -\Psi_{r,n}(-\epsilon)$. Then we shall have

$$\begin{aligned} \sup_{\{\epsilon \in W^{(r)}(\epsilon)\}} E_n(f) &= \sup_{\substack{\{\epsilon \in W^{(r)}(\epsilon)\} \\ |L|_{n-1}} \|f\|_L = \frac{1}{\pi} E_n[\Psi_{r,n}(-\epsilon)]_L = \\ &= \frac{4}{\pi} \frac{K_{r,\alpha'}}{n^r}, \quad n = 1, 2, 3, \dots \end{aligned}$$

where $K_{r,\alpha'} = \left| \sum_{\nu=0}^{\infty} \frac{\sin \left[(2\nu+1)\beta'\pi - \frac{\pi\alpha'}{2} \right]}{(2\nu+1)^{r+1}} \right|$, $\frac{1}{2} < \beta' < 1$,

$\beta'\pi$ is the root of the equation $\sum_{\nu=0}^{\infty} \frac{\cos \left[(2\nu+1)\beta'\pi - \frac{\pi\alpha'}{2} \right]}{(2\nu+1)^r} = 0$.
Assuming that $\beta' = \frac{1}{2} - \beta$, $\alpha' = 2 - \alpha$, we obtain (1.8) and (1.9).

There remains Theorem 2 to be proved. In this case $R_r(\epsilon) = \sum_{k=1}^{\infty} k^{-r} \sin \left(k\epsilon + \frac{\pi r}{2} \right) = -\Psi_{r,r+1}(-\epsilon)$.

By virtue of $\frac{1}{2} < r < 1$, $2 - r < r + 1 < 2$, we can reduce Theorem 2 to the examined case of Theorem 1'. Thus

$$\begin{aligned} \sup_{\{t \in \mathbb{R}\}} E_n(t) &= \sup_{\substack{\{t \in \mathbb{R}\} \\ \{1, 2, \dots, n\}}} \|f\|_L = \frac{1}{\pi} E_n(K_n(t))_L = \\ &= \frac{1}{\pi} E_n(\Psi_{n+1}(-t))_L = \frac{4}{\pi} \frac{K_n}{n}, \quad n = 1, 2, 3, \dots \end{aligned}$$

where $K_n = K_{n+1}$. Theorem 2 is proven.

In conclusion, we note that, according to one theorem by S. M. Nikol'skiy [10], Theorems 1, 1' and 2 are converted in the case when the approximation is examined in the metrics L .

MISCELLANEOUS

APPOINTMENTS AND DISMISSALS MADE BY STATE COUNCIL -- Peiping, Kuang-ming
Jih-pao, 9 Nov 62, p 2

The following appointments were announced by the 117th Session of
the State Council on 20 October 1962:

Chang Chin-fu (1728/0513/1133) was made vice-chairman of the Scientific and Technological Commission; Ch'en Wai-ou (7115/1120/2962) was made director, State Bureau of Surveying and Cartography; Li Ting-tsan (2621/1694/6363) was made deputy director of this same bureau; Huang Sung-ling (7806/2646/7881) was made vice-president of China People's University; Huang I-jan (7806/0001/3544) was made vice-president of Peiping University; Ch'eng Chin-wu (4453/0093/0710) was made vice-president of Peiping Teachers University; Wen Chien-p'ing (3306/1696/1627) was made vice-president of Szechwan University; Ho Hsi-lin (0149/6932/7792) was made vice-president of Nan-k'ai University; Ts'ui Hsi-mo (1508/1585/7817) was made vice-president of Tientsin University; Cheng Hsu-ch'u (6774/2485/0443) and Chou Chih-hung (0719/1807/1347) were made vice-presidents of Shanghai Chiao-t'ung University; Chiang Jui-yuan (1203/3843/0337) was made president of Heilungkiang August First Agricultural and Land Reclamation University (Heli-lung-chiang Pa 1 Nung-k'ien Ta-hsueh; 7815/7893/3068/0360/0001/6593/1083/1129/1331); Liang Hsin-ming (2733/1800/2494) was made vice-president of Kirin Industrial University; Yu Wei (0060/5517) was made president of a branch of the Foreign Affairs College (Wai-chiao Hsueh-yuan Fen-yuan; 1120/0074/1331/7108/0433/7108) Ch'en Yang-shan (7115/7402/1472) and Feng Wen-yao (7458/2429/5069) were made vice-presidents of the same branch; Yeh Shang-chih (5509/1424/1807) was made vice-president of a branch of the Central Nationalities College; Ma Chin-ch'ih (7450/6855/3069) was made vice-president of Peiping Chemical Engineering College; Hu Jen-k'uei (5170/0088/1145) was made president of the Peiping Forestry College; Wang Yu-ch'in (3769/0645/3830) and Tan Hung (0830/3163) were made vice-presidents of this same college; Yang Hsien-chin (2799/0341/2516) was made vicepresident of Northeast Forestry College; Wang Hsint'ien (3769/1800/3944) was made president of Nanking Forestry College; Ma Ta-p'u (7456/1129/3184) and Ch'en Kuei-sheng (7115/2710/7105) were made vice-presidents of this same college; Hsu Liang (6079/0081) was made vice-president of Shantung Oceanography College; Yu Chien-chang (0205/1696/4545) and Chao Ting (6392/7844) were made vice-presidents of Ch'ang-ch'un Geology College; Kao Hung-yu (7559/7703/5038) was made vice-president of the Darien Engineering College; Lo La (5012/2139) was made vice-president of the South Central Mining and Metallurgy College (Chung-nah K'uang-yeh Hsueh-yan; 0022/0589/4349/0396/1331/7108); Ch'en Yun-ko (7115/0061/7041) was made president of Chen-chiang Agricultural Mechanization College; Hu Yang (5170/2254) was made vice-president of this college; Su Yun (5658/6663) and Lo [Hui?]-k'uo (5012/3499-3500/1674) were made vice-presidents of the Lo-yang Agricultural Mechanization College.

The following dismissals were made by the State Council:

Li T'ing-tsan (2621/1649/6363), as chairman of the State Bureau of Surveying and cartography; Li Hsiang-fu (2621/4161/4596), as president of Peiping Forestry College; Cheng Wan-chun (6774/8001/6874) and Wang Hsin-t'ien (3769/1800/3944), as vice-presidents of Nanking Forestry College; Huang Shu-p'ei (7806/0647/4014), as vice-president of Kirin Industrial University; Ho Hsi-lin (0149/6932/7792), as vice-president of Peiping Teachers University; and Li Lan (7812/1526), as vice president of Northeast Petroleum College.

STATE COUNCIL APPOINTS NEW COLLEGE PRESIDENT -- Peiping, Kuang-ming Jih-pao, 11 Nov 62, p 2

On 3 November, the 119th plenary session of the State Council appointed Yu Te-yuan (0827/1795/3220) president of Ch'ang-ch'un Geology College.

STATE COUNCIL APPOINTS COLLEGE OFFICIALS -- Peiping, Kuang-ming Jih-pao, 18 Nov 62, p 2

The following appointments and dismissals were announced at the 120th plenary session of the state council:

Feng Ping-ch'uan (7458/4426/6898) was made vice-president of South China Engineering College; Chin Chao-chun (6855/0340/0971) was made vice-president of Shanghai Physical Education College; and Yang Sen (2799/2733) was removed as vice-president of Ch'ang-sha Railway College.

ACADEMY OF SCIENCES DELEGATION LEAVES FOR ALBANIA -- Peiping, Jen-min Jih-pao, 8 Nov 62, p 2

A three-man delegation from the Chinese Academy of Sciences, headed by Chou P'ei-yuan (0719/1014/3293), left by plane for Tirana, on 7 November in response to an Albanian invitation to attend the International Conference of Albanologists. At the airfield to see the delegation off were Chiang Chun-chien (1203/0689/6591), deputy director of the Department of Philosophy and Social Sciences, Chinese Academy of Sciences; and Huang I-jan (7806/0001/3544), vice-president of Peking University.

SEVENTH SESSION OF STANDARDIZATION CONFERENCE HELD IN CHINA -- Peiping, Kuang-ming Jih-pao, 14 Nov 62, p 1

The seventh session of a conference of delegates of standardization organizations of socialist countries opened in Peiping on 12 November 1962. Delegations from Albania, Bulgaria, Hungary, the German Democratic Republic, China, the Democratic People's Republic of Korea, Mongolia, Poland

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Rumania, the Soviet Union, and Czechoslovakia were in attendance. Cuba and the Democratic Republic of Vietnam are observing the session for the first time.

Chang Yu-hsuan (1728/2589)5503), vice-chairman, Chinese Scientific and Technological Commission, led the Chinese delegation.

JAPANESE MEDICAL DELEGATION ARRIVES IN CHINA -- Peiping, Jen-min Jih-pao 21 Nov 62, p 2

The six-member Japanese medical delegation sent by the Seventh Division (Medicine) of the Japan Science Council, at the invitation of the Chinese Medical Association, arrived in Peiping on 20 November 1962. The delegation, led by Prof Kentaro Hieta, was welcomed at the railway station by Huang Ting-ch'en (7806/7844/5256), vice-president, Chinese Medical Association.

CUBAN NURSING EDUCATION LEADER RETURNS HOME -- Peiping, Jen-min Jih-pao, 8 Nov 62, p 2

Maria Eulalia Besala, member of the National Nursing Education Commission, Cuban Ministry of Public Health, returned to Cuba by plane, on 3 November 1962, after visiting Peiping, Wuhau, Canton, and Shanghai.

PUBLISHING COMPANY ANNOUNCES LIST OF PERIODICALS -- Peiping, Jen-min Jih-pao, 15 Nov 62, p 6

[The following list of periodicals to be published in 1963 is taken from an advertisement by K'o-hsueh Ch'u-pan-she (Science Publishers)]:

The following 36 publications are issued by the Postal Bureau and can be obtained from the Postal Bureau in any area by completing the procedure for a 1963 subscription. Readers will please contact their local Postal Bureau.

K'o-hsueh T'ung-pao [Scientia], monthly, .45 yuan

Chung-kuo K'o-hsueh [Scientia Sinica] (foreign language), monthly 3.20 yuan

Shu-hsueh T'ung-pao [Mathematics Bulletin], monthly, 1.28 yuan

Shu-hsueh Hsueh-pao [Acta Mathematica Sinica], quarterly, 1.60 yuan

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- Li-hsueh Hsueh-pao [Acta Mechanica Sinica], quarterly, .90 yuan
- Wu-li T'ung-pao [Physics Bulletin], bimonthly, .32 yuan
- Wu-li Hsueh-pao [Acta Physica Sinica], monthly, .80 yuan
- Yuan-tzu-neng [Atomic Energy], monthly, 1.20 yuan
- ~~Yuan-tzu-neng T'su'ung [Atomic Energy Transitions], monthly, 1.00 yuan~~
- ~~Hua-hsueh T'ung-pao [Chemistry Bulletin], monthly, .30 yuan~~
- ~~Hua-hsueh Hsueh-pao [Acta Gallica Sinica], bimonthly, .90 yuan~~
- Yao-hsueh Hsueh-pao [Acta Pharmaceutica Sinica], Monthly, .80 yuan
- Sheng-wu-hsueh T'ung-pao [Biology Bulletin], bimonthly, .32 yuan
- T'u-jang T'ung-pao [Pedology Bulletin], bimonthly, .40 yuan
- Tung-wu Hsueh-pao [Acta Zoologica Sinica], quarterly, 2.00 yuan
- Chih-wu Hsueh-pao [Acta Botanica Sinica], quarterly, 1.20
- K'un-ch'ung Hsueh-pao [Acta Entomologica Sinica], quarterly, 1.40 yuan
- Wei-sheng-wu Hsueh-pao [Acta Microbiologica Sinica], quarterly, 1.20 yuan
- Chieh-p'ou Hsueh-pao [Acta Anatomica Sinica], quarterly, 1.30 yuan
- Sheng-li Hsueh-pao [Acta Physiologica Sinica], quarterly, 1.20 yuan
- Sheng-li K'o-hsueh Chin-chan [Advances in Physiological Sciences], quarterly, 1.70 yuan
- Sheng-wu Hua-hsueh Yu Sheng-wu Wu-li Hsueh-pao [Acta Biochimica et Biophysica Sinica], quarterly, 1.50 yuan
- Hai-yang yu Hu-chao [Oceanologia et Limnologica Sinica], quarterly, 1.10 yuan
- Hsin-li Hsueh-pao [Acta Psychologica Sinica], quarterly, .65 yuan
- T'u-jang Hsueh-pao [Acta Pedologica Sinica], quarterly, 1.30 yuan
- Lin-yeh K'o-hsueh [Forestry Science], quarterly, 1.10 yuan
- Shui-li Hsueh-pao [Journal of Hydraulic Engineering], bimonthly, .90 yuan
- Ti-li [Geography], bimonthly, .36 yuan

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- Ti-li Hsueh-pao [Acta Geographica Sinica], quarterly, 1.10 yuan
Ti-chih K'o-hsueh [Geological Science], quarterly, .75 yuan
Ti-chih Hsueh-pao [Acta Geologica Sinica], quarterly, 1.20 yuan
Ts'e-hui Hsueh-pao [Acta Geodetica et Cartographica Sinica], quarterly,
.90 yuan
Ch'i-hsiang Hsueh-pao [Acta Meteorologica Sinica], quarterly, 1.70 yuan
Ku-sheng-wu Hsueh-pao [Acta Paleontologica Sinica], quarterly, 1.60 yuan
Ku-Chi-ch'ui Tung-wu yu Ku Jen-lei [Vertebrate Paleontology and Anthro-
pology], quarterly, 1.30 yuan

The following publications are issued by the Hsin-hua bookstore and by the retail outlets of this company [Science Publishers]. The reader may register to purchase them at his local Hsin-hua bookstore or his local retail outlet of this company, or he may buy them directly from the issuing section of this company at No 117 Ch'ao-wei Ta-chieh, Peiping.

- T'ien-wen Hsueh-pao [Acta Astronomica Sinica], semiannual
T'ien-wen Hsueh-pao Fu-k'an [Acta Astronomica Sinica supplement], semi-
annual
Ti-ch'iu Wu-li Hsueh-pao [Acta Geophysica Sinica], semiannual
Shin-yen Sheng-wu Hsueh-pao [Acta Experimentalis Biologica Sinica], semi-
annual

[The following list of periodicals to published in 1963 was taken from an advertisement by Jen-min Wei-sheng Ch'u-pan-she (People's Hygiene Publishers). The advertisement announces that subscriptions may be arranged through local postal bureaus. All are edited by the Chinese Medical Association.]

- Chung-hua I-hsueh Tsa-chih [National Medical Journal of China], monthly
Chung-hua I-hsueh Tsa-chin Wai-wen Pan [National Medical Journal of
China, Foreign Language Edition], monthly
Chung-hua Nei-k'o Tsa-chih [Chinese Journal of Internal Medicine], monthly
Chung-hua Wai-k'o Tsa-chih [Chinese Journal of Surgery], monthly
Chung-hua Erh-k'o Tsa-chih [Chinese Journal of Pediatrics], bimonthly
Chung-i Tsa-chih [Journal of Chinese Medicine], monthly

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2. Sun Yung-sheng. Ibid. (Second Report). Publication Academy of Sciences USSR, Mathematics Series, Volume 25, 1961, pages 143-152.
3. Stechkin, S. B., On the Best Approxiamtion of Certain Classes of Periodic Functions By Trigonometric Polynomials. Publication Academy of Sciences USSR, Mathematics Series, Volume 20, 1956, pages 643-648.
4. Zygmund, A. Trigonometric Series, Volumes 1 and 2. London, Cambridge University Press, 1959.
5. Fejer, L. Trigonometrische Reihen und Potenzreihen mit Mehrfach Monotoner Koeffizientenfolge. Translated by the American Mathematical Society, Volume 39, 1936, pages 18-59.
6. Crane, M. G. On the Theory of the Best Approximation of Periodic Functions Reports of the Academy of Sciences USSR, Volume 18, Number 4-5, 1938, pages 245-249.
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8. Polia, G. and Sege, G., Problems and Theorems of Analysis, Volume 1, Moscow, State Publishing House of Theoretical and Technical Literature, 1956.
9. Akhiezer, N. I., Lectures on the Theory of Approximation, Moscow, State Publishing House of Theoretical and Technical Literature, 1947.
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QUALITATIVE CHANGES IN BIOLOGY AND PHYSICS DEBATED BY KWANGTUNG SCIENTISTS
-- Peiping, Jen-min Jih-pao, 15 Nov 62, p 5

Ch'u Yuan-ch'ueh (0575/0337/1952), in his paper "Partial Qualitative Changes Observed in Botanical Organisms During Their Development," which appeared in Hsueh-shu Yen-chiu, No 5, 1962, argues that the phenomena occurring during the development of botanical organisms is observed closely, partial qualitative changes are observable during general qualitative changes. T'ien Yun-kuang (3944/0061/0342) disagrees. In his paper titled "Partial Qualitative Changes in Biological Organisms During Their Development," Hsueh-shu Yen-chiu, No 5, 1962, he states that qualitative changes are actually quantitative changes in a new organism.

Hou Ts'an (0186/3605) and Mo Yu-li (5459/1635/4539) discussed partial qualitative changes from the point of view of the several stages in the "death process" in higher animals.

Another scientific worker in Kwangtung Province, Wu Shih-huan (0702/0013/1360), expressed his opinion on the phase change from the liquid to the gaseous state. Li Liang-te (2621/5328/1795), Physics Department, Chungshan University, has concluded, from his analysis of the problem of partial qualitative changes in simple mechanical and dynamic processes, that partial qualitative changes are generally present in the total process of quantitative change.

SIAN CHIAO-T'UNG UNIVERSITY TWINS INSTRUCTORS -- Peiping, Kuang-ming
Jih-pao 1 Nov 62, p 2

For several years, the Theoretical Mechanics Teaching and Research Section at Sian Chiao-t'ung University has been relatively successful in promoting refresher training for instructors from other schools, by establishing strict requirements, definite procedures, and a specific person to be responsible. Since 1958, this teaching and research section has provided refresher training for more than 10 instructors from outside the school, and all were relatively well able to undertake teaching duties upon their return. Since the teaching and research section is relatively busy with its major duties, they appointed an experienced lecturer to be the principal director. When instructors arrived at the teaching and research section for refresher training, he first becomes familiar with their past training and then appoints a directing instructor for them. Throughout the training, he audits the performance of both the directing instructor and the student instructors and prepares the final examination.

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During the first year, instructors getting refresher training attend all lectures and laboratories with the students and get a basic command of the content of theoretical mechanics. During their second year, they take over supplementary teaching duties with small classes, at the same time continuing to study one or two related courses. During the final semester, they listen to lectures by several instructors and compile the best points of these into lecture drafts of their own.

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BIOGRAPHIC INFORMATION

[The following biographic information on selected Chinese Communist scientific and technical personnel was taken from sources cited in parentheses.]

- AN Hsin-ku (1344/2450/0942), Surveying and Planning Institute, Ministry of Agriculture; author of an article, "Suggestions on Leveling Paddies." (Peiping, T'u-jang Soil, No 7, Aug 61, pp 58-60)
- CHANG Chun-sen (1728/3182/2773), Machinery Teaching and Research Section, Ch'ang-ch'un Geology School; author of an article, "The Secret of the 'Compass Cart.'" (Peiping, K'o-hsueh Ta-chung Popular Science, No 10, Oct 62, p 299)
- CHIAO Ch'eng-chai (6392/6134/7872)
- HSU Meng-hsing (1776/1125/3574)
- Both of the Institute of Soils, Chinese Academy of Sciences; co-authors of an article, "A Preliminary Investigation of Mechanized Plowing in the Banked-Field Region Around Nanking." (Peiping, T u-jang Soil, No 9, Dec 61, pp 39-45)
- CH'EN Ch'ing-shih (7115/3237/4311), Anhwei Agricultural College; author of an article, "Improvement of Soil Utilization in the Hilly Region Between the Yangtze River and the Huai Ho." (Peiping, T'u-jang Soil, No 2, Feb 61, pp 5-9)
- Ch'EN I-hsien, Moscow Technological Institute of the Food Industry; author of article, "Slow Processes in the Crystallization of Sugar," in Russian. (Moscow, Sakharnaya Promyshlennost', No 11, Nov 62, pp 12-14)
- CH'EN Jung-fan, Moscow State University; coauthor with A. A. Semenov of article, "On the Output Signal Fluctuation at Interference Reception of Radiowaves on Earth Routes," in Russian, Moscow, Akademiya Nauk SSSR, Radiotekhnika i Elektronika, Vol 7, No 11, Nov 62, pp 1890-1895)

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- CH'EN Sung-hung (7115/2646/1347), Agrotechnology Office, Shantung Provincial Department of Agriculture; author of an article, "The Experiences of Tsinan Municipality in Using Waste Water for Irrigation." (Peiping, T'u-jang Soil, No 2, Feb 61, pp 29-30)
- CH'EN Tso-chung (7115/0146/1813), Soil Chemistry Department, Peiping Agricultural University; author of an article, "Soil Conditions Ensuring Good Sprouting of Corn." (Peiping, T'u-jang Soil, No 7, Aug 61, pp 63-64)
- CH'ENG Lu (4453/6424), Optics Teaching and Research Section, Physics Department, Nan-k'ai University; author of an article, "High Speed Photography." (Peiping, K'o-hsueh Ta-chung Popular Science, No 10, Oct 62, pp 314-315)
- CHIA Tsui-kung (6328/6816/0361), Hunan Provincial Institute of Agricultural Sciences; author of an article, "The Effectiveness, Quality, and Storage of Hog Manure." (Peiping, T'u-jang Soil, No 4, Apr 61, pp 6-13)
- CHIANG Hao (1203/3185), Heilungkiang Province Sungari River Special District Institute of Agricultural Sciences; author of an article, "The Cultivated Black Earth of the Sungari River Region." Peiping, T'u-jang Soil, No 3, Feb 61, pp 12-13)
- CHIEN Yu-t'ai, Kharkov State University imeni A. M. Gorkiy; coauthor with A. G. Sitenko of article, "On the Coefficients of Dynamical Friction and Diffusion in a Plasma," in Russian. (Leningrad, Akademiya Nauk SSSR, Zhurnal Tekhnicheskoy Fiziki, Vol 32, No 11, Nov 62, pp 1324-1332)
- CHOU Kuan-yuan, coauthor with D. G. Kudlay and S. V. Prozorovskiy of article, "The Mutagenic Action of Antibiotics. Report 2. The Properties of Auxotrophic Mutants Obtained From the Prototrophic Lysogenic Culture S. Typhi Murium by the Action of Various Antibiotics," in Russian; first published in Antibiotiki, No 5, May 1962, pages 460-464. (Moscow, Meditsinskiy Referativnyy Zhurnal, No 11, Nov 62, Section 3, p 80)

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- CHU Hsien-mo (2612/7359/6206), Northwest Institute of Agrobiolgy, Chinese Academy of Sciences; author of an article, "A Discussion of Some Problems in Classifying the Soils of the Loess Region." (Peiping, T'u-jang [Soil], No 4, Apr 61, p 1-5)
- CHU Hung-yuan (2612/3163/0337), author of an article, "Basic Particle Physics." Peiping, Jen-min Jih-pao, 30 Oct 62, p 5)
- CHU K'o-chen (4555/0668/2823), Chinese Academy of Sciences; author of an article, "The Pulsation of World Climate During Historical Times." (Peiping, Ch'i-hsiang Hsueh-pao [Acta Meteorologica Sinica], Vol 31, No 4, Jan 62, pp 275-288)
- CHU Lien-ch'ing (2612/5571/7230), Wasteland Surveying and Planning Institute, Ministry of State Farms and Land Reclamation; author of an article, "A Discussion of the Work 'Some Trends in the Development of Pedology and Geography.'" (Peiping, T'u-jang [Soil], No 7, Aug 61, pp 47-49)
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- FANG I-lang, author of article, "Behavior of Some Respiratory and Enteric Virus in Tissue Cultures," in Russian; first published in Voprosy Virusologii, No 3, March 1962, pages 359-361. (Moscow, Meditsinskiy Referativnyy Zhurnal, No 11, Nov 62, Section 3, p 55)
- HOU Hsueh-yu (0816/1331/3558), Institute of Soils, Chinese Academy of Sciences; author of an article, "The Relationship Between the Soil Salination and the Vegetation of the Natural Regions of China." (Peiping, T'u-jang [Soil], No 7, Aug 61, pp 1-13)
- HSIANG Li-p'ing (0686/3810/1627), Production Office, Tsinghai Provincial Department of Agriculture and Forestry; author of an article, "The Masses' Experiences in Improving the Saline Soil of the Tsaidam Basin." (Peiping, T'u-jang [Soil], No 1 Jan 61, pp 21-22)

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HSIN Khun-kan (6580/0981/0051), Clay Fertilizer Office, Kiangsi Provincial Department of Agriculture; author of an article, "Good Composts Using Phragmites sp. and Miscanthus sp." (Peiping, T'u-jang [Soil], No 2, Feb 61, p 24)

HSIUNG Chen-min (3574/2182/3046), Chekiang Agricultural College; author of an article, "The Experiences of the Farmers of the Hai-ning Region of Chekiang Province in Planting Crops Suitable to the Soil." (Peiping, T'u-jang [Soil], No 1, Jan 61, pp 29-30)

HUANG Jui-p'ing (7806/3843/1627), Lien-yang Agricultural School, Fukien Nan-p'ing Special District Institute of Agricultural Sciences; author of an article, "The Prevention of Exhaustion in 'Exhausted Fields.'" (Peiping, T'u-jang [Soil], No 2, Feb 61, p 33)

KAO Hsien-sheng (7559/0341/5116), Chinese Institute of Agricultural Mechanization (Chung-kuo Nung-yeh Chi-hsieh-hua K'o-hsueh Yen-chiu Yuan; 0022/0948/0653/2914/2894/2750/0553/4430/1331/44282/4496/7108); author of an article, "Standardization of Drainage and Irrigation Equipment." (Peiping, K'o-hsueh Ta-chung [Popular Science], Oct 62, pp 289-290)

KAO Liang (7559/2733), Biogeocoenology Station, Chinese [Academy of] Sciences (Chung-kuo K'o-hsueh Sheng-wu-Ti-li Ch'un-lo Chan; 002/0948/4430/1331/3932/3670/0966/3810/5028/5507/4541)

CH'AI Yin (2693/6147), K'un-ming Institute of Botany (K'un-ming Chih-wu So; 2492/2494/2784/3670/2076), Chinese Academy of Sciences
Coauthors of an article, "Carbon Dioxide of the Tropical Soils of Southern Yunnan Province." (Peiping, T'u-jang [Soil], No 9, Dec 61, pp 29-38)

KAO Yuan (7559/0626), deputy director, Department of Technical Sciences, Chinese Academy of Sciences; author of article, "Research on Friction, Abrasion, and Lubrication and Its Significance in the National Economy." (Peiping, Kuang-ming Jih-pao, 18 Nov 62, p 2)

KU Kuo-ts'ai (0657/0948/5932)

FAN Sheng-p'ing (5400/4141/5493)

P'EI Te-an (5952/1795/1344)

All of the Kiangsi Provincial Institute of Agricultural Sciences; coauthors of an article, "The Genesis and Transformation of the Red Sandy Soil in the Kao-an Region." (Peiping, T'u-jang [Soil], No 1, Jan 61, pp 14-16)

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- LI Fen-i, Moscow State University, author of dissertation for the scientific degree of Candidate of Chemical Sciences, "Investigation of the Physical Nature of Active Centers of Nickel During Degradation of Cyclohexane by Magneto-Granulometric Methods," in Russian. (Moscow, Vechernyaya Moskva, 3 Nov 62, p 4)
- LI Hsiao-fang (2621/1321/5364), Geology and Geography Department Peiping University; author of an article, "Some Opinions After Reading the Work, 'Some Trends in the Development of Pedology and Geography' (Peiping, T'u-jang [Soil], No 7, Aug 61, pp 50-51)
- LI Hsiu-nan (2621/4423/3948), Peiping Plant Physiology Laboratory, Chinese Academy of Sciences; author of an article, "The Determination of Hydrogen Sulfide in Soil." (Peiping, T'u-jang [Soil], No 1, Jan 61, pp 31-32)
- LI Hsueh-chu (2621/1331/2691), Peiping Agricultural University; author of an article, "The Relationship Between the Control of Night Soil and Deep Fertilization of Winter Wheat." The author acknowledges the suggestions of Prof Li Lien-chieh (2621/6647/2212). (Peiping, T'u-jang [Soil], No 7, Aug 61, pp 14-33)
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- CHAO Keng-shen (6392/1649/3947)
- Both of the Northwest Institute of Agrobiolgy, Chinese Academy of Sciences; coauthors of an article, "The Drab Soils of the Han Chiang River Valley Within the Borders of Shensi Province and Their Improvement." The authors acknowledge the review of their article's manuscript by Chu Hsien-mo (2612/7359/6206) and Yao Chen-hao (1202/182/6964), as well as the assistance of Huang K'ai (7806/0418), Kuo Chin-ju (6753/6855/1172), Tu Pao-chen (2629/1405/3791), Chao Ch'iu-fang (6392/4428/5364), and Chang Chih-lin (1728/1807/2651). (Peiping, T'u-jang [Soil], No 9, Dec 61, pp 46-54)
- LI Yu-shan (2621/3768/1472), Northwest Institute of Agrobiolgy, Chinese Academy of Sciences; author of an article, "The Effects of Deep Plowing on Furrow Structure and on the Water-Retaining Capacity of the Soil." (Peiping, T'u-jang [Soil], No 3, Mar 61, pp 6-12)
- LI Yuan (2621/2606-0037), Peiping Planetarium; author of an article, "The Crystal in the Form of Layer Candy." (Peiping, K'o-hsueh, Tu-chung [Popular Science], No 10, Oct 62, pp 308-309)

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- LIANG Tseng-shou (2733/1073/1108), Institute of Electrical Equipment (Tien-ch'i K'o-hsueh Yen-chiu Yuan; 7193/0892/4430/1331/4282/4496/7108); author of an article, "Silicon -- Treasure of the Sand." (Peiping, K'o-hsueh Ta-chung [Popular Science], No 10, Oct 62, pp 300-301)
- LIN Ching-liang (2651/2529/0081), Soil and Agrochemical Department, Fukien Agricultural College; author of an article, "Rapid Increases in Soil Fertility To Support Agricultural Production." (Peiping, T'u-jang [Soil], No 7, Aug 61, pp 39-41)
- LIU Chia-sung (0491/1367/2646), Radio Department, Tientsin University; author of an article, "The Science of Mimicking Living Beings." (Peiping, K'o-hsueh Ta-chung [Popular Science], No 10, Oct 62, pp 302-303)
- LIU Fen-ch'ai, Moscow Geological Prospecting Institute imeni S. Ordzhonikidze; author of dissertation for the scientific degree of Candidate of Geological-Mineralogical Sciences, "Geological Structure and Conditions of the Formation of the Starobinsk Deposits of Potassium Salts," in Russian. (Moscow, Vechernyaya Moskva, 3 Nov 62, p 4)
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- CHOU Wei-chin (0719/0251/6855)
Both of the Institute of Soils, Chinese Academy of Sciences, coauthors of an article, "Application of Phosphorous Fertilizers to the Calcareous Soils of Kiangsu Province." The authors acknowledge the guidance of Li Ch'ing k'uei (2621/1987/6652) and the assistance of Wang K'uan-t'ing (3769/1401/0080), Wu Ta-kao (0702/6671/7559), and Hsu Cheng-ch'uan (1776/1767/3123). (Peiping, T'u-jang [Soil], No 9, Dec 61, pp 13-16)
- LO Hsin-mao, Kiev Medical Institute imeni A. A. Bogomolets; author of dissertation for the scientific degree of Candidate of Medical Sciences, "Role of Hormonal and Nerve Factors in the Development of Induced Tumors in Mammary Glands of Mice," in Russian. (Kiev, Pravda Ukrainy, 4 Nov 62, p 4)
- MAI Mao-ying (7769/5399/5391), Microbiology Teaching and Research Section, Soil Chemistry Department, Shantung Agricultural College; author of an article, "An Investigation of the Effectiveness of Nitrogen-Fixing Bacterial Fertilizers and Suggestions on Their Use." (Peiping T'u-jang [Soil], No 7, Aug 61, pp 55-57)
- T'ANG Hsi-k'o (3282/6932/3784), Institute of Botany, Chinese Academy of Sciences; author of an article, "A Discussion of the Relation Between the Vegetation and Subsurface Water of the Arid and Semiarid Regions of China." (Peiping, T'u-jang [Soil], No 7, Aug 61, pp 34-38)

- T' IEN Chao-shun (3944/0340/7311), Institute of Soils, Chinese Academy of Sciences; author of an article, "The Composition of the 'Hua-chien-t'u' (5363/4354/0960; "Spent Alkaline Soil") of Northern Anhwei Province and Its Improved Use." (Peiping, T'u-jang [Soil], No 9, Dec 61, pp 17-28)
- T' IEN Shu-sen, Moscow Institute of Steel and Alloys; coauthor with Yu. A. Skakov of article, "Mosaic Structure of Aluminum," in Russian. (Moscow, Metallovedeniye i Termicheskaya Obrabotka Metallow, No 11, Nov 62, pp 10-13)
- TS'AO Sheng-keng (2580/0581/6342), Institute of Soils, Chinese Academy of Sciences; author of an article, "An Index of Hardness of Rice-Paddy Soil and Its Application." (Peiping, T'u-jang [Soil], No 9, Dec 61, pp 7-12)
- TS'ENG Shui-ch'uan (2582/3055/3123), Botany and Pedology Teaching and Research Section, Geology and Geography Department, Chung-shan University; author of an article, "The Acidity of the Soils of Kwangtung Province." (Peiping, T'u-jang [Soil], No 7, Aug 61, pp 42-46)
- TSOU Ch'eng-hsi (6760/2110/3556), Soil Surveying and Planning Institute, Ministry of Agriculture; author of an article, "Some Opinions on Land Utilization in the Loess Plateau Region." (Peiping, T'u-jang [Soil], No 1, Jan 61, pp 23-24)
- WANG Tsun-ch'in (3769/6690/6024)
- LIU Wen-ch'i (0491/2429/2978)
- YU Wen-ju (1429/2429/3843)
- SUNG Jung-jua (1345/2837/5478)
All of the Institute of Soils and Water and Soil Conservation (T'u-jangchi Shui-t'u Pao-ch'ih Yen-chiu So; 0960/1099/0644/3055/0960/0207/ 2170/4282/4496/2076), Chinese Academy of Sciences; author of an article, "Canalization and Water-Control Paddies As an Important Trend in the Improvement of the Saline Soils in Chinese Plain Regions." (Peiping, T'u-jang [Soil], No 3, Mar 61, pp 1-7)
- WEI Pao-ning, Moscow State University; coauthor with Z. A. Iofa of article "Effect of pH on Rate of Corrosion and Anodic Dissolution of Cobalt," in Russian. (Moscow, Akademiya Nauk SSSR, Zhurnal Fizicheskoy Khimii Vol 36, No 11, Nov 62, pp 2558-2560)

C-O-N-F-I-D-E-N-T-I-A-L

WU Chung-hsien (0702/0112/6343), author of an article, "A New Age of Biological Sciences." (Peiping, Kuang-ming Jih-pao, 14 Nov 62, p 2)

WU [Yun?] (0702/0391/0542), Institute of Soils, Chinese Academy of Sciences
Author of an article, "Economical Methods of Applying Phosphorus Fertilizers to Paddy-Rice Soils." The author acknowledges the assistance of Hsu Yung-fu (1776/3057/4395) and Chou Huo-kuei (0719/3499/0964). (Peiping, T'u-jang [Soil], No 9, Dec 61, 58-59)

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7 September 2004

Ms. Roberta Schoen
Deputy Director for Operations
Defense Technical Information Center
7725 John J. Kingman Road
Suite 0944
Ft. Belvoir, VA 22060

Dear Ms. Schoen:

In February of this year, DTIC provided the CIA Declassification Center with a referral list of CIA documents held in the DTIC library. This referral was a follow on to the list of National Intelligence Surveys provided earlier in the year.

We have completed a declassification review of the "Non-NIS" referral list and include the results of that review as Enclosure 1. Of the 220 documents identified in our declassification database, only three are classified. These three are in the Release in Part category and may be released to the public once specified portions of the documents are removed. Sanitization instructions for these documents are included with Enclosure 1.

In addition to the documents addressed in Enclosure 1, 14 other documents were unable to be identified. DTIC then provided the CDC with hard copies of these documents in April 2004 for declassification review. The results of this review are provided as Enclosure 2.

We at CIA greatly appreciate your cooperation in this matter. Should you have any questions concerning this letter and for coordination of any further developments, please contact Donald Black of this office at (703) 613-1415.

Sincerely,

A handwritten signature in black ink that reads "Sergio N. Alcivar".

Sergio N. Alcivar
Chief, CIA Declassification Center,
Declassification Review and Referral
Branch

Enclosures:

1. Declassification Review of CIA Documents at DTIC (with sanitization instructions for 3 documents)
2. Declassification Status of CIA Documents (hard copy) Referred by DTIC (with review processing sheets for each document)



Processing of OGA-Held CIA Documents

The following CIA documents located at DTIC were reviewed by CIA and declassification guidance has been provided.

OGA Doc ID	Job Num	Box	Fldr	Doc	Doc ID	Document Title	Pub Date	Pages	Decision	Proc Date
AD0335308	78-03117A	194	1	23	4363	Scientific Information Report Chemistry And Metallurgy (26)	3/7/1963	71	Approved For Release	3/25/2004
AD0335625	78-03117A	197	1	3	4460	Scientific Information Report Chemistry And Metallurgy (27)	4/4/1963	51	Approved For Release	3/25/2004
AD0336825	78-03117A	199	1	26	4562	Scientific Information Report Chemistry And Metallurgy (28)	5/9/1963	70	Approved For Release	3/25/2004
AD0332150	78-03117A	183	1	5	3916	Scientific Information Report Chinese Science (11)	10/4/1962	52	Approved For Release	3/29/2004
AD0332434	78-03117A	183	1	40	3951	Scientific Information Report Chinese Science (12)	10/19/1962	59	Approved For Release	3/29/2004
AD0332795	78-03117A	184	1	37	3988	Scientific Information Report Chinese Science (13)	11/5/1962	48	Approved For Release	3/29/2004
AD0333069	78-03117A	186	1	7	4028	Scientific Information Report Chinese Science (14)	11/16/1962	30	Approved For Release	3/29/2004
AD0333148	78-03117A	187	1	19	4078	Scientific Information Report Chinese Science (15)	11/29/1962	44	Approved For Release	3/29/2004
AD0333835	78-03117A	189	1	6	4144	Scientific Information Report Chinese Science (16)	12/21/1962	65	Approved For Release	3/29/2004
AD0334108	78-03117A	190	1	2	4179	Scientific Information Report Chinese Science (17)	1/10/1963	56	Approved For Release	3/29/2004
AD0334105	78-03117A	191	1	12	4230	Scientific Information Report Chinese Science (18)	1/18/1963	25	Approved For Release	3/29/2004
AD0334378	78-03117A	192	1	21	4277	Scientific Information Report Chinese Science (19)	2/1/1963	27	Approved For Release	3/29/2004
AD0334433	78-03117A	193	1	22	4322	Scientific Information Report Chinese Science (20)	2/15/1963	28	Approved For Release	3/29/2004
AD0335021	78-03117A	194	1	37	4377	Scientific Information Report Chinese Science (21)	3/8/1963	59	Approved For Release	3/29/2004
AD0335847	78-03117A	198	1	33	4526	Scientific Information Report Chinese Science (22)	4/18/1963	61	Approved For Release	3/29/2004
AD0336327	78-03117A	200	1	3	4578	Scientific Information Report Chinese Science (23)	5/2/1963	68	Approved For Release	3/29/2004
AD0337167	78-03117A	201	1	26	4643	Scientific Information Report Chinese Science (24)	5/23/1963	95	Approved For Release	3/29/2004
AD0337777	78-03117A	202	1	27	4687	Scientific Information Report Chinese Science (25)	6/6/1963	52	Approved For Release	3/29/2004
AD0338474	78-03117A	203	1	27	4727	Scientific Information Report Chinese Science (26)	6/20/1963	83	Approved For Release	3/29/2004
AD0338687	78-03117A	204	1	32	4772	Scientific Information Report Chinese Science (27)	7/5/1963	80	Approved For Release	3/29/2004
AD0339386	78-03117A	206	1	4	4820	Scientific Information Report Chinese Science (28)	7/17/1963	32	Approved For Release	3/29/2004
AD0339147	78-03117A	207	1	11	4862	Scientific Information Report Chinese Science (29)	7/30/1963	48	Approved For Release	3/29/2004
AD0340927	78-03117A	208	1	35	4924	Scientific Information Report Chinese Science (30)	8/21/1963	53	Approved For Release	3/29/2004
AD0341855	78-03117A	209	1	43	4974	Scientific Information Report Chinese Science (31)	9/5/1963	46	Approved For Release	3/29/2004
AD0342464	78-03117A	210	1	38	5013	Scientific Information Report Chinese Science (32)	9/16/1963	43	Approved For Release	3/29/2004
AD0342608	78-03117A	211	1	36	5054	Scientific Information Report Chinese Science (33)	9/27/1963	41	Approved For Release	3/29/2004