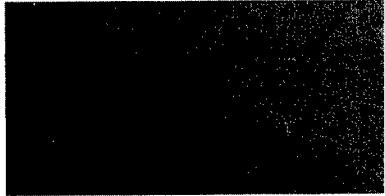
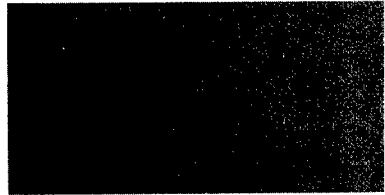


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No. 197

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PEOPLE'S REPUBLIC OF CHINA SCIENTIFIC ABSTRACTS

No. 197

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CONTENTS	PAGE
K'UN-CH'UNG HSUEH-PAO [<u>ACTA ENTOMOLOGICA SINICA</u>] No 2, May 1978	1
TI-CHIH HSUEH-PAO [<u>ACTA GEOLOGICA SINICA</u>] No 1, Febrero 1978	11
TI-CH'IU HUA-HSUEH [<u>GEOCHIMICA</u>] No 2, June 1978	19
TA-LIEN KUNG-HSUEH-YUAN HSUEH-PAO [<u>JOURNAL OF TA-LIEN ENGINEERING INSTITUTE</u>] No 1, March 1978	25

ACTA ENTOMOLOGICA SINICA

AUTHOR: MA Shih-chun [7456 0013 7486]

ORG: Institute of Zoology, Chinese Academy of Sciences

TITLE: "Prospects in the Prognosis of Agricultural Insect Pests"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2, May 78 pp 113-121

EXCERPT FROM ENGLISH ABSTRACT: This paper deals with the problems of prognosis of agricultural insect pests. Discussions are devoted to the following topics: (1) influences on insect fauna and their population fluctuations by the change in cropping systems and environmental reconstructions; (2) synthetic courses and systemization in the schemes for monitoring pest population fluctuations; (3) the suppression of insect pest populations, especially by means of using their natural enemies and changing the spatial structures of their habitats; (4) use of descriptive and mathematical models for forecasting insect population fluctuations; (5) insight into the dynamics of insect population systems by using multiple factor analysis and simulation method; and (6) the significance of local insect population structures and the biological diversity of some species with wide ranges of distribution.

AUTHOR: KUAN Hsueh-ch'ien [7070 7185 6591]

WU Chih-hsin [1566 0037 7451]

WU Ch'iu-yen [0702 4428 7159]

FENG Hui [7458 1979]

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

TITLE: "Studies on Rearing Trichogramma Dendrolimi Matsumura In Vitro"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2, May 78 pp 122-126

TEXT OF ENGLISH ABSTRACT: In recent years the utilization of trichogrammatid wasps for suppressing agricultural and forestial insect pests has been increasing in its scale and also in the pest range. In practice, eggs of oak silkworm Antheraea pernyi and Eri silkworm Philosamia ricini are used as factitious hosts for multiplication, and the adult wasps are liberated into the fields. But supplying silkworm eggs in large enough quantities becomes a difficult problem when the egg parasites are used on a very large scale. Therefore, we studied some artificial media for culturing the parasites and some success has been obtained by using the hanging drop method. Artificial nutritional media originated from hens' eggs or hens' eggs plus hydrolysates of casein and nucleic acids were applied. The lengths of the developing periods of the immature stages were similar to those when intact eggs of oak

[continuation of K'UN-CH'UNG HSUEH-PAO No 2, May 78 pp 122-126]

silkworm were used as hosts. But the media still showed some defects because the growth of some individuals stopped at the larval or prepupal stages. Our results suggested that aside from the nutritional factors, the physical environment provided for the developing parasites is also of great importance.

AUTHOR: HSIA Pang-ying [1115 6721 7336]
KUO Fu [6753 6744]

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

TITLE: "Characteristics of the DNA from Pupal Gonads of Bombyx Mori L."*

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2, May 78 pp 127-132

EXCERPT FROM ENGLISH ABSTRACT: This paper deals with the preparation and determination of some fundamental properties of the DNA from the pupal gonads of Bombyx mori L. The results are as follows: The peak of u.v. absorption of the testicular DNA in 0.1 x SSC (0.015 M NaCl plus 0.0015 M trisodium citrate; pH = 7.0) is at 260 nm; the minimum is at 234 nm. Thermal-hyperchromicity at 260 nm is 1.40. From the thermal denaturation curve it was found that the melting temperature (T_m) is 69.7°C. Calculation according to the equation $GC = (T_m - 53.9) \times 2.44$ gives the percentage content of guanine plus cytosine (G + C) to be 38.6% of the total bases.

* Help was received from comrade KUO Yao-chun [6753 1031 0689] of the Institute of Biophysics in mapping ultraviolet absorption spectra.

AUTHOR: None

ORG: Insect Virus Laboratory, Department of Biology, Hua-chung Teachers College, Hupoh

TITLE: "The Histopathology of Heliothis Armigera Caused By a Nuclear Polyhedrosis Virus VHA-273"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2, May 76 pp 133-136

EXCERPT FROM ENGLISH ABSTRACT: This paper deals with the histopathological changes caused by VHA-273, a recently isolated NPV from H. armigera. This virus infects mainly the fat body, hypodermis and tracheal matrix. However, the damages of the midgut epithelium, muscles, Malpighian tubes, etc., are not detectable.

In serial sections of the diseased larvae, the first symptom to be observed under the microscope is an enlargement of the nuclei of the susceptible tissues which seemed to be affected simultaneously in the haemocoel. After infection, the duration from the appearance of the first symptom to replication and growth of the polyhedra, the hypertrophied nuclei full-filled with polyhedra, and the breakdown of the tissues, lasts only about five to six days. Thereafter, disintegration of the other tissues is extremely rapid, and the peak of mortality might be reached by the seventh day.

AUTHOR: None

ORG: Research Group on the Integrated Control of Soybean Insects of Hui-ming District, Shantung Province

TITLE: "Studies on the Soybean Agromyzid Fly in Shantung Province"^{**}

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2, May 76 pp 137-150

EXCERPT FROM ENGLISH ABSTRACT: The agromyzid fly Melanogromyza sojae is one of the most damaging pests infesting soybeans. It occurs in all the soybean cultivation areas of Shantung province and its host plants include more than nine cultivated and wild legume plants. The larvae tunnel into the stems and interrupt the conduction of water and nutrients. Soybean seedlings may thus be killed, the growth of the older plants is retarded, and the crop yields are greatly reduced.

*Aid in the present work was received from FAN Tzu-te [5400 3320 1795] of the Shanghai Entomological Institute, CHU Ju-teo [4376 3067 0146] of the Chekiang College of Agriculture, and SHIH Yu-liang [4258 3022 0081] and MOU Chi-yuen [3664 0679 0337] of the Shantung Agricultural Academy.

AUTHOR: PEN Kuei-ying [6321 2710 5391]
SU T'i-yun [5685 1879 0061]
CH'EN Hsiu-tao [7115 4423 6670]

ORG: All of the Tsinghai Institute of Biology

TITLE: "Studies on the Bionomics of Three Pyemotid Mites From Tsinghai"*

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2,
May 78 pp 151-160

EXCERPT FROM ENGLISH ABSTRACT: Three pyemotid mites, namely Siteroptes chinghaiensis, S. huangshuiensis and S. avenae, were reared in the laboratory on their associated food fungi and their life cycles, the influences of temperature and humidity on survival and development, and their relationships to the fungi were studied.

* CH'EN Hsin-t'ao [7115 1800 7118] of the Chung-shan Academy of Medical Sciences, LAN Ming-yang [5695 2494 7122] of the Soochow Academy of Medical Sciences and HO Hsin-ch'iao [0149 2450 2890] of our Institute provided guidance.

AUTHOR: LI Ch'uan-lung [2621 0278 7127]

ORG: Institute of Zoology, Chinese Academy of Sciences

TITLE: "The Early Stages of Chinese Rhopalocera--Luehdorfia chinensis Leach (Parnessiidae: Zerynthiinae)**

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2,
May 78 pp 161-163

TEXT OF ENGLISH ABSTRACT: Luehdorfia puziloi Erschoff (1871), L. japonica Leach (1889) and L. chinensis Leach (1893-94) are recognized in this paper to be three sibling species of the genus Luehdorfia.

The present paper deals with the morphological characters of the immature stages of L. chinensis Leach including comparisons of the eggs, larvae and pupae of the above-mentioned three sibling species. Photographic illustrations of the early stages are also given.

* Help was received from the Hangchow Bureau of Parks and Forests and comrade YEN Heng-yuan [7346 5899 0337]. Photographs of L. chinensis Leach were taken by comrade LI Ming-yuan [2621 2494 6678] of the Peking Bureau of Parks and Forests.

AUTHOR: T'ANG Peng-te [3282 4366 1795]

ORG: Agricultural College of Shensi

TITLE: "Discussion on Matsucoccus Matsumurae (Kuw.) With Description of a New Species"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2, May 78 pp 164-170

EXCERPT FROM ENGLISH ABSTRACT: Due to the confusion of the type-species with many others of the genus for a number of years in the world literature, mistakes were often made on the identification of the pine bark scales, an exotic serious pest in eastern China. In this paper, after a review of the related works on this species in the world, a discussion on the species identification is given.

"The present article was reviewed by comrades TS'AI Pang-hue [5591 6721 5476] and LI Ye-chieh [2621 0068 2635].

AUTHOR: WANG Ping-yuan [3769 1627 6678]
SUNG Shih-moi [1345 1102 5912]
LI Ch'eng-cheng [2621 2082 4345]

ORG: WANG and SUNG of the Institute of Zoology, Chinese Academy of Sciences;
LI of the Shanghai Institute of Entomology, Chinese Academy of Sciences

TITLE: "On a New Species of the Genus Niphadareg--Superficially Close to Catagala Adiurella (Lepidoptera: Pynalidae, Schorabiniina)"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2, May 78 pp 171-172

TEXT OF ENGLISH ABSTRACT: Niphadareg denoccolites sp. nov., which superficially resembles the paddy hoper Catagala adiurella but is structurally distinct from it, has recently been found in China. It is closely allied to N. heplites in structure of both male and female genitalia but can easily be distinguished from it by the much curved and sharply hooked sclerotized teguminal process. For detailed description and biology see the text.

AUTHOR: CHAO Hsiu-fu [6392 0208 1788]

ORG: College of Agriculture of Fukien

TITLE: "A Study on Chinese Braconid Wasps of the Tribe Spathiini (Hymenoptera, Braconidae, Doryctinae)**"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2, May 78 pp 173-184

EXCERPT FROM ENGLISH ABSTRACT: This is the second part of a series of two papers dealing with Spathiini of China. Eleven new species belonging to the species-groups of caesidorus Nixon, alipes Wilkinson, laucippus Nixon, testaceitarsis Cameron, rusticulus Wilkinson, labdacus Nixon, ruficeps Smith, alternicoloratus Chao (new species-group), and imbecillus Enderlein of the genus Spathius Nees and one new species of the genus Platyspathius Viereck are dealt with. Besides, one species of the group of alipes Wilkinson is recorded for the first time from China. Type specimens are deposited in the Institute of Zoology of the Chinese Academy of Sciences.

* Part I published in ACTA ENTOMOLOGICA SINICA Vol 20 No 2, pp 205-216.

AUTHOR: HSUEH Wan-ch'i [5641 8001 3823]

ORG: Pen-hsi Municipal Health Station, Liaoning Province

TITLE: "Eight New Species of the Genus Blaesoxipha (S. Lat.) Loew from Liaoning, China (Diptera: Sarcophagidae)**"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2, May 78 pp 185-193

EXCERPT FROM ENGLISH ABSTRACT: These new species dealt herewith were mainly collected from the mountainous region in eastern Liaoning, China, in 1964-1976. The types are preserved in the Pen-shi Municipal Health Station, Liaoning.

* Help was received from FAN Tzu-te [5400 3320 1795], comrade CHAO Chien-ming [6392 1696 6900] of the Institute of Zoology, Chinese Academy of Sciences. Some specimens were supplied by comrade MA Chung-yu [7456 1813 0151] of the Liaoning Hygiene and Quarantine Station, and comrade LIU Chien-sheng [0491 1696 3932] of the Kirin Pai-ch'eng District Hygiene and Quarantine Station.

AUTHOR: FAN Ch'i-sheng [2868 0796 5116]
MA Shao-yuan [7456 4801 2266]

ORG: Both of the Sanitary and Epidemiological Station of Teinghai Province

TITLE: "A New Species of the Genus Calliphora R.-D. From Teinghai Province, China (Diptera: Calliphoridae)"*

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2, May 78 pp 194-196

TEXT OF ENGLISH ABSTRACT: Calliphora (Acrophaga) chinghaiensis sp. nov.
The description of this new species is based on two male specimens collected from the southern part of Teinghai province, China. The holotype (♂) is deposited in the Shanghai Institute of Entomology, Chinese Academy of Sciences.

It is closely related to the boreal Eurasian species Calliphora (Acrophaga) subalpina (Ringdahl, 1931), but differs from the latter in having the following features in the male: (1) two posthumeral bristles, (2) four pairs of marginal scutellar bristles, (3) long and dense echinosity on the basal third of surstylus, (4) the pregonite much more slender and straight, with three bristles distally.

Females unknown.

[continuation of K'UN-CH'UNG HSUEH-PAO No 2, May 78 pp 194-196]

A key to Chinese species of Calliphora is appended.

* Help was received from comrades FAN Tzu-te [5400 3320 1795] and CH'EN Chih-tzu [7115 0037 2737].

AUTHOR: None

ORG: Field Pest Comprehensive Prevention Group, Institute of Plant Protection, Kirin Provincial Academy of Agriculture

TITLE: "Studies on Seed Treatment With Organophosphorous Insecticides for the Control of White Grubs"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2, May 78 pp 207-211

ABSTRACT: In the central plains of Kirin Province, white grubs include mainly the larvae of *Holotrichia diomphalia* Bates. There are also a smaller number of larvae of *Miridiba koreana* N. & K., *Anomala straminea* Semenov, *Eotrichia titanis* Reitter, and *Anomala exoeta* Fald. The severest damage is suffered by young seedlings of kaoliang and corn, and roots of rotated beans and wheat and sugar beet which follows the bean crop. In the past, grain or dirt mixed with 666 [Hexachlorocyclohexanum] was primarily used to control grubs, but the poisonous bait was easily blown away by the strong spring wind. From 1973-76, experiments with treatment of seeds with such organophosphorous pesticides as Phoxim, etc. were carried out by more than twenty production teams in five counties in fields of more than 500 mu. The good results withstood the test of the severe incidence of grubs in 1976. Furthermore, the treatment also appeared to promote sprouting of the seeds. Portions of the experimental results are presented.

AUTHOR: MU Li-i [1970 4539 5030]

ORG: Entomology Teaching and Research Group, Shantung College of Agriculture

TITLE: "Preliminary Experiments on Controlling Cotton Aphids With Granular Carbonfuran"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2, May 78 pp 212-216

ABSTRACT: In view of the fact that cotton aphids (*Aphis gossypii* Glover) is becoming more resistant to common organophosphorous pesticides, while an increased density and frequency of application will cause environmental pollution and death to natural enemies of pests, the author and colleagues made small granules of carbonfuran to be mixed with cotton seeds for aphid control. When 3 catties of the granules of 3 percent furan are used per mu of cotton seeds, effective control of aphids lasts about 55 days. Spraying of pesticide before the wheat harvest to control cotton aphids is no longer necessary, and the furan drug has an obvious action of promoting the growth of the cotton. Carbonfuran (or Curafer, Furadan) acts as an internal absorption pesticide. According to reports in foreign countries, its half-decay period in soil is 30-60 days. On cotton leaves, it disappears completely in 8 days without trace. It does not accumulate in the bodies of animals or men. Toxicity data of this drug are quoted from the book by J.K. Ronald and H.W. Dorough, listed in the reference materials.

AUTHOR: CH'EN Hsing-pao [7115 5201 0202]

ORG: Peng-pu Medical College

TITLE: "Survey of Chigger Mites on Pigs in Southern Kiangsu Province with Descriptions of Two New Species (Acari-formae: Trombiculidae)"¹

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2, May 78 pp 197-203

EXCERPT FROM ENGLISH ABSTRACT: This is a report on the survey of chigger mites parasitic on pigs in southern Kiangsu province. Sixteen species of mites are found, of which two are considered new to science.

¹ Help was received from colleagues HSI Yin-shih [1776 5523 4303] and WEN T'ing-huan [3306 1694 2719] of the Shanghai Academy of Medical Sciences No 1.

AUTHOR: LI Pao-lin [7128 1408 7671]

ORG: None

TITLE: "The Integrated Control of Mosquitoes"

SOURCE: Peking K'UN-CH'UNG HSUEH-PAO [ACTA ENTOMOLOGICA SINICA] in Chinese No 2, May 78 pp 217-232

TEXT OF ENGLISH ABSTRACT: In this paper the trend of mosquito control has been discussed. In integrated control both the mosquitoes and their environment, as well as the factors of safety, effectiveness, economy and simplicity in practice, must be considered as a whole. Various controlling measures, such as chemical, biological, physical and environmental, should be used in reasonable combination according to the suitability of the place and time.

The recent developments in chemical, biological, genetic and environmental controlling measures have been reviewed. In chemical control the use of insect growth regulators and pyrethroids and the ultralow volume (ULV) application of insecticides have been mentioned. In the field of biological and genetic control, although much progress has been made in the past decade, great success in practical use, especially on a large scale (perhaps with the exception of larvivorous fishes) may come in the future. The writer is of the opinion that, with the principle of integrated control

[continuation of TI-CHIH HSUEH-PAO No 1, Feb 78 pp 1-14]

time, brief diagnoses of a few important new forms are given here so as to make the new taxa available to the science.

* The following aided in identifying species appearing in this article: LIU Yu-hai [0491 3768 3189] and CHANG Kuo-jui [1728 0948 3843]; also CH'EN Ch'u-chen [7115 2806 7201], WANG Hui-chi [3769 1920 1015], WANG Shang-ch'i [3769 1424 0796], LU Li-ch'ang [4151 4409 2490], OU-YANG Shu [2962 7122 5289] and WANG Chen [3769 2182], all of the Nanking Institute of Geology and Paleontology, Chinese Academy of Sciences.

AUTHOR: TENG Pao [6772 1405]

ORG: None

TITLE: "On the Discovery of Early Carboniferous Flora From Shanyang, S. Shensi and Its Stratigraphic Significance"

SOURCE: Peking TI-CHIH HSUEH-PAO [ACTA GEOLOGICA SINICA] in Chinese No 1, Feb 78 pp 15-21

TEXT OF ENGLISH ABSTRACT: The flora of Esh-yu Eryu formation collected from Shanyang, S. Shensi, consisting chiefly of Cardiopteridium spitzbergense Nathorst, C. nanum (Eichwald) Nathorst, Archaeocalamites scrobiculatus (Schloth.) Seaward, Triphyllopteris collombiana Schimper, Rhodea hsiang, hsiangensis Sze, Adiantites sp., Cardiopteris? spp., Lepidodendron shanyangense n. sp., is unquestionably Lower Carboniferous Visean in age and its occurrence in E. Ch'in-ling is reported here for the first time.

AUTHOR: CHUO YU [1978, 1979]

ORG: None

TITLE: 10. *Ischnura elegans* (Zett.)

SOURCE: Peking 11-1111-1111 [1978, 1979] in *Science* No 1, Feb 78 pp 22-24

TEXT OF ENGLISH ABSTRACT: The structure of the male genitalia was established on the specimens collected by the author in the mountainous glacial zone of the Lower Paleozoic Ningbo [1978, 1979] in Zhejiang. The subdosome is very large and consists of four components, a basal plate, and measuring more than 110 μ m in length. The distal part of the basal plate, with a width of about 3 mm, has a wide, shallow, U-shaped notch at its distal parts. At the proximal end of the notch, the basal plate is 2.0-3.0 mm in length and 0.8-1.0 mm in width, whereas in the distal portion it is 1.0-1.5 mm in length and 1-1.2 mm in width. Proximally there are 11-12 teeth, and distally 5, but distally 5 in the same space.

AUTHOR: YANG Yu [1978, 1979]

ORG: None

TITLE: 11. *Ischnura elegans* (Zett.)

SOURCE: Peking 11-1111-1111 [1978, 1979] in *Science* No 1, Feb 78 pp 25-32

TEXT OF ENGLISH ABSTRACT: The arcuate structural zone of worm has its extension in the northern part of the Lower Paleozoic Ningbo [1978, 1979] in Zhejiang and the western part of the Lower Paleozoic Ningbo [1978, 1979] in Zhejiang. It is a structural zone of enormous size with a length of more than 100 km, and is composed of three first-order structural units. The geological data available indicates that it may represent a fold belt of the Lower Paleozoic of an orogenic-type structural system, with its backbone located in the arcuate zone of Ningbo in the north.

The arcuate structural zone is considered to be a tectonic and orogenic in its development at the end of the Mesozoic period. It is a tectonic zone, however, even at the present time, it is considered to be an orogenic-type structural system.

AUTHOR: WANG Heng-sheng [3769 1854 0581]
PAI Wen-chi [4101 2429 0679]
WAN Ch'uan-yung [1354 0278 3057]

ORG: None

TITLE: "A Petro-Chemical Classification of Basic and Ultrabasic Rocks"

SOURCE: Peking TI-CHIH HSUEH-PAO [ACTA GEOLOGICA SINICA] in Chinese No 1, Feb 78
pp 33-39

TEXT OF ENGLISH ABSTRACT: Serving as a sequel to "A Method For the Calculation of Chemical Analysis of Basic and Ultrabasic Rocks" (published in ACTA GEOLOGICA SINICA, 1975, No 1), the present paper deals further with the petro-chemical classification.

The question of unifying the petro-chemical classification with the modal mineralogical classification is a subject into which a great many petrologists have been probing for a long time. The present method of calculation provides a good basis for solving such petrological problems.

The petro-chemical classification of this paper has been made on the basis of 222 items of data with more accurate quantitative chemical analyses as well as modal mineralogical composition selected from the literature available both at home and

[continuation of TI-CHIH HSUEH-PAO No 1, Feb 78 pp 33-39]

abroad. The numeric characters calculated from an electronic computer in accordance with the method concerned are projected onto the diagram. In addition, a variate of three different numbers has been adopted, and a Q-type point-group analysis has been calculated for the 222 rocks with the computer.

The comparison between the results of the analyses and the diagrammatic classification shows that the proposed calculation method, the diagram and the petro-chemical classification of this paper are relatively simple and appropriate.

AUTHOR: T'AO K'uei-yuan [7118 1145 0337]
WU Yen [0702 1484]
HUANG Kuang-chao [7806 0342 2507]
CH'EN Chieh-ken [7115 2212 1626]

ORG: None

TITLE: "The Structural and Facies Characteristics of Niang-niang-shan Paleocaldera"

SOURCE: Peking TI-CHIH HSUEH-PAO [ACTA GEOLOGICA SINICA] in Chinese No 1, Feb 78
pp 40-52

TEXT OF ENGLISH ABSTRACT: The paleocaldera of Niang-niang-shan, an oval basin-shaped volcanic structural depression of middle scale, is composed of alkaline volcanic complex. It is a product of later magmatic stages of Nanking-Wuhu volcanic basin of Late Cretaceous age. The volcanic structure is well preserved and consists of crater, vent, parasitic volcanic pipe and others. The relation between volcanic structure and its corresponding volcanic facies is the essential basis in recognizing the nature and history of the volcanism. The facies of the paleovolcano can be divided into facies of pipe zones (the zone surrounding the pipe, including the sub-facies of eruption-explosion, eruption and explosion), facies of pipe-neck (including the sub-facies of hot ash flow and lava extrusion) and the facies of subvolcanic rocks and intrusive pipes. Finally a genetic model diagram is given in this paper.

AUTHOR: None

ORG: Detachment No 8, Comprehensive Geological Brigade of T'ung-hua Region and the Laboratory of Petrology and Mineralogy and Kirin Institute of Geological Sciences

TITLE: "Changbaiite ($PbNb_2O_6$), A New Mineral of Lead and Niobium from Eastern Kirin, China"

SOURCE: Peking TI-CHIH HSUEH-PAO [ACTA GEOLOGICA SINICA] in Chinese No 1, Feb 78
pp 53-62

TEXT OF ENGLISH ABSTRACT: Changbaiite is a new oxide of lead and niobium occurring in kaolin veinlets in kaligranite of east Kirin, China. It occurs as pale brown, yellow brown, creamy white or colorless transparent tabular crystals, and spherulite of 0.2-5 mm in diameter; strongly adamantine to pearly, brittle with cleavage {0001} perfect, transparent to translucent, and white streak. Microhardness 472.4 kg/mm^2 , Mohs' hardness 5.3, D meas. = 6.47, D calc = 6.51.

The crystal morphology of this new mineral as studied on a two-circle goniometer shows forms {0001}, {000 $\bar{1}$ }, {01 $\bar{1}$ 1}, {10 $\bar{1}$ 1}, {10 $\bar{1}$ 2}, {01 $\bar{1}$ 2} and {11 $\bar{2}$ 0} in order of decreasing prominence. The point group is 3 m. The morphological axial ratio c/a is 1.1005 (X-ray axial ratio c/a is 1.1003).

[continuation of TI-CHIH HSUEH-PAO No 1, Feb 78 pp 53-62]

Changbaiite belongs to the trigonal system with a space group $R\bar{3}m$ having $a = 10.499 \text{ \AA} \pm 0.025$, $c = 11.553 \text{ \AA} \pm 0.015$ (from hexagonal cell), $Z = 9$. The strongest diffraction line of the powdered patterns is shown to be 3.100 (10), 3.028 (9), 2.160 (5), 1.919 (4), 1.760 (6), 1.621 (5).

This mineral is optically uniaxial positive, but often biaxial because of its optical anomaly; $N_e = 2.485$, $N_o = 2.476$. Reflectance is 15.86 at 546 nm.

Electron microprobe and chemical analysis of the changbaiite lead to the idealized formula $PbNb_2O_6$.

The results of both infrared absorption spectrum and the differential thermal analysis are given.

The mineral is named after its discovery site near the Ch'ang-pai mountain in east Kirin, China.

AUTHOR: FANG Hua-chu [2455 5478 4554]

ORG: Institute of Geology and Mineral Resources, Chinese Academy of Geological Sciences

TITLE: "Calculation of a Magnetic Anomaly by Three-Dimensional Bodies of High Susceptibility with Arbitrary Shapes"

SOURCE: Peking TI-CHIH HSUEH-PAO [ACTA GEOLOGICA SINICA] in Chinese No 1, Feb 78 pp 63-78

TEXT OF ENGLISH ABSTRACT: A method for calculating a magnetic anomaly by three-dimensional isotropic bodies of high susceptibility with arbitrary shapes in a stable magnetic field (homogeneous or heterogeneous) is presented. The essence of the method is to calculate the magnetic anomalies caused externally by the density of magnetic charges on the surface of the magnetic bodies, which is defined by the second type of Fredholm's integral equation. On the basis of the study of the physical significance of the problem, the integral equation, after discretization, is solved by a constrained Seidel's iteration method. Both the accuracy and the rate of the calculation are comparatively satisfactory.

An approximate method is also proposed to calculate the demagnetization of the "relatively homogeneous magnetized body." For relatively heterogeneous bodies it

[continuation of TI-CHIH HSUEH-PAO No 1, Feb 78 pp 63-76]

is appropriate to take the density of the magnetic charges on the surface deduced by this method as the initial values in the iterative process.

Through calculation of several theoretical models, the author has made some preliminary researches in the aspects of demagnetization of a heterogeneously magnetized body and discrimination of ore from non-ore magnetic anomalies by means of artificially magnetized anomalies.

AUTHOR: None

ORG: None

TITLE: "IUGS Delegation Visits China"

SOURCE: Peking TI-CHIH HSUEH-PAO [ACTA GEOLOGICA SINICA] in Chinese No 1, Feb 78 pp 79-80

TEXT OF ENGLISH ABSTRACT: The IUGS delegation headed by Professor R. Trippy, the IUGS president, visited China from 15 September to 14 October, 1977, at the invitation of the Geological Society of China. The members of the delegation were: Norman Fisher (Australia), Guillermo Salas (Mexico), John Sutton (U. K.), Digby McLaren (Canada), Frances Delany (U. K.), Charles Drake (U. S. A.), K. J. Hsu (Switzerland), Anders Martinsson (Sweden) and William Hutchinson (Canada).

Vice-Premier KUI Mu [6253 3668] met and had cordial talks with the IUGS delegation during their stay in Peking. SUN Ya-kuang [1327 1129 0342], Director of the State Bureau of Geology, met the foreign friends and gave a dinner in their honor.

Our friends toured Kwangchow, Shanghai and Kweilin, visited the Ya-ch'ing oil field, Ch'ang-ch'un Geological College, Kwangtung Bureau of Geology, the Chinese Academy of Geological Sciences and its subordinate organizations--the Institute of

[continuation of TI-CHIH HSUEH-PAO No 1, Feb 78 pp 79-80]

Geomechanics and the Institute of Geology and Mineral Resources, and the Geological Institute of the Chinese Academy of Sciences. They also made a field excursion in Yunnan province. They showed a great interest in the various tectonic phenomena in China and were deeply impressed by the achievements made in geological survey and scientific research after liberation.

The IUGS delegation met a great number of geologists while visiting China. Most of the delegation members gave lectures, and their Chinese colleagues had discussions with them on various geological problems.

Our foreign friends gave an account of the IUGS and IGCP organizations and their activities. Professor HSU Chieh [6079 2638], acting president of the Geological Society of China, and YEH Feng [5509 6912], one of the leading members of the State Bureau of Geology, exchanged views with the IUGS representatives about the further scientific cooperation between the Geological Society of China and IUGS and other organizations. The GSC agreed to participate in the work of the following IUGS subordinate organizations: Subcommittee on Ordovician Stratigraphy, Subcommittee on Silurian Stratigraphy, Subcommittee on Devonian Stratigraphy, Subcommittee on Carboniferous Stratigraphy, Subcommittee on Cretaceous Stratigraphy, Subcommittee on Quaternary Stratigraphy, Working Group on Precambrian-Cambrian Boundary, and IGCP projects: No 1, Accuracy in time; No 24, Quaternary glaciations in the

[continuation of TI-CHIH HSUEH-PAO No 1, Feb 78 pp 79-80]

northern hemisphere; No 29, Precambrian-Cambrian boundary; No 118, Upper Precambrian correlations, No 143, Remote sensing and mineral exploration. Furthermore, GSC will also consider participating in the International Paleontological Association on the basis of having a further knowledge of it.

The visit of the IUGS delegation to China has promoted the scientific cooperation between the Geological Society of China and the IUGS, and the better understanding and friendship between the Chinese geologists and the geologists of the countries concerned.

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CSO: 4009

GEOCHIMICA

AUTHOR: O Mo-lan [6759 5459 1526]

ORG: None

TITLE: "Physicochemical Environment for the Formation of Wu-yang-shan Granite Intrusive, Kwangsi, China"

SOURCE: Peking TI-CH'IU HUA-HSUEH [GEOCHIMICA] in Chinese No 2, Jun 78 pp 89-103

TEXT OF ENGLISH ABSTRACT: Wu-yang-shan granite occurs as a stock of its main body-- Ku-p'o-shan granite batholith, which intruded during the Indosinian movement. Physicochemical analyses for magmatic stages indicate that Ku-p'o-shan granite was formed at 2000 bars and 800-700°C, representing anchi-minimum melts, and Wu-yang-shan granite at 500-1000 bars and 750-710°C, corresponding as well to anchi-minimum melts. The latter seems most likely to be a product of differentiation from the former.

As is obvious from mineral parageneses, the mineral composition of Ku-p'o-shan-Wu-yang-shan granite is simple (Bi + Mi + Pl + Q), which may be attributed to a high $\mu_{\text{Na}_2\text{O}}$ value in the magma.

Late- and post-magmatic metasomatism was extensively developed. Microclinization

[continuation of TI-CH'IU HUA-HSUEH No 2, Jun 78 pp 89-103]

is considered to have taken place at 500-1000 bars, $T = 650\text{ C}$, $(X_{\text{Na}^+} / X_{\text{K}^+})_L = 0.08$, albitization at 500-1000 bars, $T = 600\text{ C}$, $(X_{\text{Na}^+} / X_{\text{K}^+})_L > 2$, $(X_{\text{Na}^+})^2 / X_{\text{Ca}^{2+}} = 18 \times 10^8$, greisenization at 500-1000 bars, $T = 500-400\text{ C}$ accompanied by rare metal mineralization; the solution being acid with $\text{pH} = 5.5-6$.

Mesozoic granites of Nanling are quite similar to Wu-yang-shan granite in composition, while Mesozoic granites of Yenshan exhibit a more complicated composition with less-developed albitization due to high $\mu_{\text{K}_2\text{O}}$ and low $\mu_{\text{Na}_2\text{O}}$ in the magma. This difference would probably be responsible for the ore formation. Whether high $\mu_{\text{Na}_2\text{O}}$ in primary magma favors rare metal mineralization still remains a problem to which more attention should be given in the future.

AUTHOR: YANG Wei-hua [2799 5588 5478]

ORG: None

TITLE: "A Linear Model of Petroleum and Gas Geochemistry"

SOURCE: Peking TI-CH'IU HUA-HSUEH [GEOCHIMICA] in Chinese No 2, Jun 78 pp 104-123

TEXT OF ENGLISH ABSTRACT: Two problems concerning petroleum and gas geochemistry are dealt with in this paper.

First, a logarithmic normal distribution has been revealed with respect to organic carbon and chloroform bitumen A among dispersed organic matters in rocks on the bases of a large number of analysis data. A linear regression equation is then established relating $\log(A_{\text{bitumen}}/C_{\text{organic}})$ and $\log C_{\text{organic}}$ by means of statistical regression analysis. Physical meanings are attached to the coefficients of this equation in the light of a theoretical formula which fits well with the former in accordance with the Mass Action Rule. Percentage of A_{bitumen} transportation has been estimated from these results using a statistical approach, and its implications are discussed with regard to the evaluation of oil generating strata. A linear model is suggested with respect to C_{organic} and A_{bitumen} which would provide more information on oil strata evaluation.

Secondly, multiple linear discriminant analysis has been carried out on Triassic and

[continuation of TI-CH'IU HUA-HSUEH No 2, Jun 78 pp 104-123]

Permian gas strata using normal gas analysis data, leading to the establishment of a linear equation with a probability of 88%. It is therefore apparent that gas beds can be distinguished satisfactorily with the aid of discriminant analysis based on gas analysis data. From this point of view, discriminant analysis has won an advantage over expensive instrumental analysis.

AUTHOR: LIU Ch'ung-hai [0491 1504 4406]

ORG: None

TITLE: "Ion-Combination Characteristics of Some Oil Field Waters From China"

SOURCE: Peking TI-CH'IU HUA-HSUEH [GEOCHIMICA] in Chinese No 2, Jun 78 pp 124-134

TEXT OF ENGLISH ABSTRACT: Three types of oil-bearing structures are recognized in terms of ion-combination on the basis of the chemistry of oil field waters from some major gas-oil basins in China:

1. Low total solid (<10 g/l), Cl^- - HCO_3^- - Na^+ combination with trace SO_4^{2-} ;
2. Medium total solid (10-60 g/l), Cl^- - Na^+ combination, without SO_4^{2-} ;
3. High total solid (40-145 g/l), Cl^- - Na^+ combination containing SO_4^{2-} .

Information on the characteristics of ion-combination would be of practical significance in oil research and prospecting.

AUTHOR: CH'EN Yeh-yu [7115 8518 5713]
CH'EN Te-hui [7115 1795 1920]

ORG: None

TITLE: "Micro-chemical Analysis of Olivine and Pyroxene in Meteorites"

SOURCE: Peking TI-CH'IU HUA-HSUEH [GEOCHIMICA] in Chinese No 2, Jun 78 pp 135-141

TEXT OF ENGLISH ABSTRACT: A closed decomposition technique has been developed for simultaneous determination of SiO_2 , Al_2O_3 , CaO , MgO in an equal aliquot and continuous analysis of ferrous and total iron in the presence of O-phenanthroline hydrate. Only about a 5 mg sample is required for the determination of all the six components mentioned above.

The sample is fused with alkali followed by treatment with acid. Then the solution is taken by one aliquot for the determination of the first four components. SiO_2 is determined with molybdenum blue, and Al_2O_3 analyzed by colorimetric method with eriochrom cyanine R. Ca in the organic phase is titrated with EDTA. Then MgO in the aqueous phase is continuously titrated by EDTA. This method more satisfactorily solves the problems involved in simultaneous determination of large amounts of Mg and minor Ca.

[continuation of TI-CH'IU HUA-HSUEH No 2, Jun 78 pp 135-141]

As the sample is decomposed in a closed container, O-phenanthroline hydrate is added to prevent oxidation of ferrous iron. In this way ferrous iron under the order of a milligram can be determined with certainty and no additional effort has to be made to protect it from oxidation. This method is recommended for the analysis of olivine and pyroxene separates from meteorites.

* Comrade CH'IH Chia-hsiang [3069 1367 4382] participated in some of the work.

AUTHOR: None

ORG: Cooperation Group, Kweiyang Institute of Geochemistry, Institute of Atomic Energy, Chinese Academy of Sciences

TITLE: "A Preliminary Study of Cosmogenic Radionuclide Al^{26} in the Kirin Meteorite"

SOURCE: Peking TI-CH'IU HUA-HSUEH [GEOCHIMICA] in Chinese No 2, Jun 78 pp 142-147

TEXT OF ENGLISH ABSTRACT: Cosmogenic radionuclide Al^{26} has been measured in the Kirin meteorite by non-destructive gamma-ray spectrometry and gamma-gamma coincidence spectrometry. In the light of the specific activity of cosmogenic radionuclide Al^{26} , its "orbital effect" has been discussed, considering the modulation of galactic cosmic ray intensity along the meteorite orbit due to solar magnetic activity. Through the comparison of the measured value of Al^{26} specific activity, with its maximum saturation value obtained on the assumption that the meteorite orbit was always beyond the solar modulation, the aphelion of the orbit of the Kirin meteorite is estimated to be $q' = 2.17 \pm 0.54$ (AU). It is therefore concluded that the Kirin meteorite is most likely derived from asteroids of the Apollo family.

* Personnel participating in this study were CHOU Hsiao-hsia [0719 1420 7209], SUNG Shao-i [1345 4801 0308] and LI Jui-hsiang [2621 3843 7449].

AUTHOR: CHU Ping-ch'uan [2612 3521 3123]

ORG: None

TITLE: "Formation Age and Evolutional History of the Kirin Meteorite"

SOURCE: Peking TI-CH'IU HUA-HSUEH [GEOCHIMICA] in Chinese No 2, Jun 78 pp 148-156

TEXT OF ENGLISH ABSTRACT: It is indicated by isotopic dating that the condensation of the solar nebula started at about 4.7 b.y. ago, and the time interval within which various parent bodies of meteorites were formed is greater than 120 m.y. The radius of the Kirin meteorite is calculated from K-Ar ages to be 200-220 km and the buried depth less than 20 km using the thermal conductive model presented. The Kirin chondrite has a young Ar^{38} exposure age of 8.3 m.y. By plotting the exposure ages of chondrites against their dimensions, the existence of an equilibrium state can be suggested between the formation of chondrites and their extinction through erosion.

AUTHOR: HSIA K'o-ting [1115 0344 1353]

LIU Lien-fan [0491 5114 3879]

CHOU Wei-nan [0719 1983 8189]

TSUNG P'u-ho [1350 2528 0735]

I Wei-hsi [2496 1919 3356]

ORG: HSIA, LIU, CHOU of the Shanghai Nuclear Research Institute; TSUNG, I of the Chinese Academy of Sciences, Kweiyang Institute of Geochemistry

TITLE: "Mössbauer Study of the Kirin Meteorite Shower"

SOURCE: Peking TI-CH'IU HUA-HSUEH [GEOCHIMICA] in Chinese No 2, Jun 78 pp 157-163

TEXT OF ENGLISH ABSTRACT: Mössbauer spectra have been obtained for whole-rock samples, some of the principal ore minerals such as pyroxene, olivine, troilite and Fe-Ni alloys (kamacite and taenite), as well as for the fusion crust of the Kirin meteorite shower. Mössbauer spectra of terrestrial olivine and pyrrhotite have also been measured for comparative purposes. Based on these measurements, discussions are given to the percent content of nickel atom in kamacite and taenite, the perfectness of crystal lattice of troilite and, as is evidenced by the spectra of silicate minerals, the extent of equilibrium and metamorphism in the Kirin meteorite.

AUTHOR: WANG San-hsueh [3769 0005 1331]

ORG: None

TITLE: "Calculation of Principal Refractive Indices with the Aid of a Spindle Stage (I)"

SOURCE: Peking TI-CH'IU HUA-HSUEH [GEOCHIMICA] in Chinese No 2, Jun 78 pp 164-168

TEXT OF ENGLISH ABSTRACT: A ternary simultaneous equation group is established to correlate the three principal refractive indices of a biaxial mineral with its three nonprincipal indices. The deviation between calculated and measured values ranges from 0.0001 to 0.0018, which is similar to the precision obtained by the traditional immersion method in daylight. This technique is suitable for determining the three principal refractive indices, especially when they are difficult to measure in immersion oil because of the lack of desired orientation or some other reason. It can also be used as a check on the validity of refractive index measurement.

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CSO: 4009

JOURNAL OF TA-LIEN ENGINEERING INSTITUTE

AUTHOR: CHUNG Wan-hsieh [6945 8001 0533]
CH'ENG Keng-tung [4453 5105 2639]
CH'IU Ch'un-hang [5941 2504 5300]

ORG: Department of Mathematical Mechanics, Ta-lien Engineering Institute

TITLE: "Some Applications of Group Theory to Structural Analysis"

SOURCE: Ta-lien TA-LIEN KUNG-HSUEH-YUAN HSUEH-PAO [JOURNAL OF TA-LIEN ENGINEERING INSTITUTE] in Chinese No 1, Mar 78 pp 1-20

TEXT OF ENGLISH ABSTRACT: In the present paper, using group theory, systematic and powerful computational methods are established to analyze symmetric structures. Based on the representation theory of finite groups and the isomorphism concept of groups, the invariable subspaces and corresponding bases in displacement space are determined for a variety of symmetric structures, such as television towers, antennas, water towers, etc. The generalized displacement unknowns on the bases are orthogonal to each other, and the coupling terms do not appear in the energy expression. Corresponding linear algebraic equations are decomposable and can be solved block by block. Consequently, in solving by digital computer the required storage and run time is largely saved. According to the results obtained in this paper, a number

[continuation of TA-LIEN KUNG-HSUEH-YUAN HSUEH-PAO No 1, Mar 78 pp 1-20]

of computer programs have been developed to analyze a variety of large-scale symmetric structures. In practice the effectiveness of the methods has been sufficiently proved.

AUTHOR: CHUNG Wan-hsieh [6945 8001 0533]
CH'ENG Keng-tung [4453 5105 2639]
CHENG Lin [6774 3829]
HU Yun-ch'eng [5170 0061 4453]

ORG: CHUNG, CH'ENG both of the Department of Mathematical Mechanics, Ta-lien Engineering Institute; CHENG, HU of Shanghai Municipal Engineering Design Institute

TITLE: "The Calculation of Internal Forces in the Supporting Framework of a Reinforced Concrete Water Tower"

SOURCE: Ta-lien TA-LIEN KUNG-HSUEH-YUAN HSUEH-PAO [JOURNAL OF TA-LIEN ENGINEERING INSTITUTE] in Chinese No 1, Mar 78 pp 21-40

TEXT OF ENGLISH ABSTRACT: In this paper, by virtue of the result of the thesis "Some Applications of Group Theory to Structural Analysis," a computational method which expands the nodal displacement unknowns into a finite Fourier Series is developed to calculate internal forces in the supporting framework of a reinforced concrete water tower. Due to the orthogonality of the finite Fourier Series, the orthogonality of corresponding generalized displacement unknowns and the decomposability of final linear algebraic equations is vividly proved. The details of the related computer program are briefly described. The program has been used to design a number of practical water towers.

AUTHOR: None

ORG: Earthquake Research Laboratory, Department of Water Conservancy, Ta-lien Engineering Institute

TITLE: "The Influence of Finite Deformation on Vibration Modes and Frequencies"

SOURCE: Ta-lien TA-LIEN KUNG-HSUEH-YUAN HSUEH-PAO [JOURNAL OF TA-LIEN ENGINEERING INSTITUTE] in Chinese No 1, Mar 78 pp 41-46

TEXT OF ENGLISH ABSTRACT: The present article discusses the effects on structural vibration modes and frequencies caused by finite deformations of gelatin model during a dynamical model test. As mentioned in the paper, the geometrical non-linear behavior of the model caused by finite deformations will not introduce significant variations to its vibration periods, but its half-periods will be altered. That is, if the first half-period is lengthened, then the second half-period will be shortened and vice versa. For symmetrical-shaped structures, even the half-periods of vibrations will not be affected. In general, the influence of such geometric non-linearizing is not large, and the free vibration of structures may be considered as harmonic.

AUTHOR: FAN Chia-ting [5400 1367 7844]

ORG: Mapping Teaching and Research Office, Department of Water Conservancy

TITLE: "Precision Adjustment of the Position of a Point by the Three-Side Location"

SOURCE: Ta-lien TA-LIEN KUNG-HSUEH-YUAN HSUEH-PAO [JOURNAL OF TA-LIEN ENGINEERING INSTITUTE] in Chinese No 1, Mar 78 pp 47-56

TEXT OF ENGLISH ABSTRACT: By use of an automatic geodimeter we can determine the position of a point by intersection of two sides. In case three sides are employed to locate a point, it becomes necessary to adjust the point location by the method of least squares.

Herein a simple method of adjustment is derived and recommended for application.

AUTHOR: CH'IH Chung-hsien [6688 1813 0314]

ORG: Specialty of Computer Programming

TITLE: "An Economical Algorithm for Static Storage Allocation in FORTRAN Implementation"

SOURCE: Ta-lien TA-LIEN KUNG-HSUEH-YUAN HSUEH-PAO [JOURNAL OF TA-LIEN ENGINEERING INSTITUTE] in Chinese No 1, Mar 78 pp 57-62

TEXT OF ENGLISH ABSTRACT: This paper presents an economical algorithm for static storage allocation in FORTRAN implementation. In this paper, "call" relation is applied between program units to complete repeated allocation for economizing run-time storage. The algorithm can be used in allocation of local, temporary variables and optimal array elements index register.

AUTHOR: CH'IU Ch'un-hang [5941 2504 5300]

ORG: Specialty of Computer Programming

TITLE: "On the Calculation of Shallow Spherical Shells"

SOURCE: Ta-lien TA-LIEN KUNG-HSUEH-YUAN HSUEH-PAO [JOURNAL OF TA-LIEN ENGINEERING INSTITUTE] in Chinese No 1, Mar 78 pp 63-73

TEXT OF ENGLISH ABSTRACT: This paper deals with the calculation of deflections and internal forces of shallow spherical shells under uniform external pressure by means of the finite element method.

Comparing with the well-known approximate formula, that of the boundary effect superposing to membrane solution, the cause producing a considerable error in the formula had been found, using as an example a shallow spherical shell clamped on a square bottom.

Consequently, a modified formula has been proposed by producing a sum of infinite geometric progression. Results obtained in this paper for the above example are identical to those obtained by the finite difference method.

Additionally, for the singularity at corners of shallow spherical shells simply

[continuation of TA-LIEN KUNG-HSUEH-YUAN HSUEH-PAO No 1, Mar 78 pp 63-73]

supported on a hexagonal bottom, successive and automatic computation in fine mesh has been made using an equivalence transformation.

AUTHOR: LO Yuan-ch'uan [5012 6678 6112]

ORG: Specialty of Computer Programming

TITLE: "A New Method to Construct Non-Standard Real Number Field"

SOURCE: Ta-lien TA-LIEN KUNG-HSUEH-YUAN HSUEH-PAO [JOURNAL OF TA-LIEN ENGINEERING INSTITUTE] in Chinese No 1, Mar 78 pp 74-80

TEXT OF ENGLISH ABSTRACT: This paper presents a new method to extend the real number field, which is different from that of A. Robinson. This method defines a non-standard number as a real number pair of infinite sequence and shows that all non-standard numbers constitute an ordered number field. Rigorous definitions of infinity and infinitesimal are given in this paper. Some fundamental conceptions of mathematical analysis are explained on this basis.

AUTHOR: LIU T'ieh-niu [0491 6993 3662]

ORG: Theoretical Mechanics Teaching and Research Office

TITLE: "Dynamic Analysis of Pneumatic Small Amplitude Vibration Mechanism"

SOURCE: Ta-lien TA-LIEN KUNG-HSUEH-YUAN HSUEH-PAO [JOURNAL OF TA-LIEN ENGINEERING INSTITUTE] in Chinese No 1, Mar 78 pp 81-92

TEXT OF ENGLISH ABSTRACT: In this paper the working process of the pneumatic small amplitude vibration mechanism is abstracted into a dynamic system of the second order. Dynamic analysis is performed for the motion process of the system. It makes use of the "subsequent points" method, which makes it easy to understand the transitional process of the impact motion of the system. Based on the demands of engineering techniques with regard to the impact motion process, the calculation formula for choosing the system parameter is worked out. "Phase trace method," a method for calculating the period or frequency of the vibration due to impacts, has been given.

3
AUTHOR: LI Yen-shuo [2621 1750 4311]

ORG: Hydraulics Teaching and Research Office

TITLE: "A Review of Two Formulas on Water Hammer in P. G. Kiselev's 'Handbook of Hydraulic Calculations,' 1972 Edition"

SOURCE: Ta-lien TA-LIEN KUNG-HSUEH-YUAN HSUEH-PAO [JOURNAL OF TA-LIEN ENGINEERING INSTITUTE] in Chinese No 1, Mar 78 pp 93-98

TEXT OF ENGLISH ABSTRACT: A critical analysis is given of two formulas on water hammer in a penstock of a reaction-turbine system, published in the "Handbook of Hydraulic Calculations" of P. G. Kiselev (USSR), 1972. Their errors are demonstrated by concrete examples. Finally, simple and practical formulas are introduced.

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CSO: 4009

END