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No. 54

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18 October 1976

USSR AND EASTERN EUROPE SCIENTIFIC ABSTRACTS

BIOMEDICAL AND BEHAVIORAL SCIENCES

No. 54

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BIOMEDICAL SCIENCES
Aerospace Medicine

EAST GERMANY

KAMMEL, H., MD, senior lieutenant, and KORN, F., graduate psychologist, MD,

DEGREE OF ALERTNESS AND FLIGHT SAFETY. FIRST RESULTS ON THE QUANTITATIVE
OBJECTIVIZATION OF SUBCLINICAL FLUCTUATIONS IN THE DEGREE OF ALERTNESS
IN A PILOT

East Berlin ZEITSCHRIFT FUER MILITAERMEDIZIN in German Vol 17 No 3, Jun 76
signed to press 11 Sep 75, pp 145-147

[Abstract] Studies were carried out on a pilot to establish the fluctuations
in the degree of alertness. Acoustical stimuli were administered in such a
manner that they systematically varied in the range of normal and abnormal
bioelectrical cerebral activity. The reaction time between the stimulus and
the operation of a hand-held pushbutton was measured over a series of 200
stimuli. The reaction times and periods were superimposed on the electro-
phalogram, and it was possible to compare the normal and abnormal cerebral ac-
tivities. The tests demonstrated clearly that with decreasing degrees of alert-
1/2

EAST GERMANY

KAMMEL et al ZEITSCHRIFT FUER MILITAERMEDIZIN, Vol 17 No 3, Jun 76 pp 145-147

ness the reaction time to acoustic stimuli varies. The degree of alertness,
capable of being measured on the basis of the electroencephalogram, may be
translated into flight safety when operating a fighter aircraft. However, the
results of these tests are unsuitable for determining the degree of fitness
of the test person as a fighter aircraft pilot. But it helps in monitoring
changes in fitness in these terms in an active pilot. Figures 3; references 3:
2 German and 1 Western.

USSR

UDC 612.014.482.5+613.693

YAZDOVSKIY, V. I.

ARTIFICIAL BIOSPHERE

Moscow ISKUSSTVENNAYA BIOSFERA [Translation above] in Russian, Nauka Press 1976, 224 pages

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (III) 1976 Abstract No 7R533 K]

[Text] The book deals with the creation of an artificial biosphere. Resolution of this problem is extremely important in designing spacecraft, submarines, interplanetary stations, etc. The book describes methods of satisfying man's basic physiological needs under these conditions. Possible patterns of turnover of chemical elements and compounds are given. Considerable attention is focused on the development of closed ecological systems.

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USSR

UDC 613.693

KAS'YAN, I. I.

ADAPTATION TO WEIGHTLESSNESS

Moscow IZVESTIYA AKADEMII NAUK SSSR. SERIYA BIOLOGICHESKAYA in Russian No 4, 1976 pp 495-508

[Abstract] The results of animal experiments and the experience of 29 cosmonauts on several kinds of spacecraft show that animals and man can adapt to prolonged weightlessness from one flight to another and during the same flight. The nature and intensity of the sensory, vestibular-autonomic, and motor reactions as well as the speed of adaptation were determined mainly by the individual characteristics of the cosmonauts (compensatory and adaptive capacity), the quality of special, ground, and flight training, and the number of training periods under conditions of temporary weightlessness in specially equipped planes. Figures 5; tables 7; references 14: 9 Russian, 5 Western.

1/1

Agrotechnology

USSR

UDC 575.113

KORDYUM, V. A., doctor of biological sciences and CHERNIKH, S. I., candidate of biological sciences

POSSIBILITIES AND PERSPECTIVES OF GENETIC ENGINEERING IN HIGHER PLANTS

Kiev VISNYK AKADEMIY NAUK UKRAYNS'KOY RSR in Russian No 6, Jun 76 pp 47-58

[Abstract] The following directions in genetic engineering are reviewed: transformation, transduction, viral conversion, transgenosis, directed mutagenesis and a complete control of the reconstruction of heredity. One of the most important problems in genetic engineering is to produce plants capable of fixing atmospheric nitrogen. Several important steps have been already accomplished in this area. References 54: 5 Russian, 49 Western.

1/1

USSR

UDC 631.528:633.511

AVAKHODZHAYEV, M. KH., EGAMBERDIYEV, A. E., GAYBULLAYEV, I. KH., and ZHUMANIYAZOV, I. ZH., Institute of Experimental Plant Biology, Academy of Sciences of the Uzbek SSR

THE NATURE OF WILT RESISTANCE OF NEW COTTON CHEMOMUTANTS

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 3, 1976 signed to press 2 Sep 75 pp 60-62

[Abstract] A key factor in wilt resistance is the production of phytoalexine as an inhibitor in the plant tissues after infection. The investigation concentrated on one such chemical compound, known as isohemigossypol, as produced in several hybrids of the cotton S-4727 grown in sterilized quartz sand. At the stage of 6-7 true leaves, the cotton plants were infected with the fungus *Verticillium dahliae*, by injection. Results indicated that the hemomutants L-3 and L-4 produced more isohemigossypol in the incubation period of wilt than did the original hybrid S-4727. This explains the higher wilt resistance of the new varieties, and the frequent rejection of the infection entirely. Tables 2, references: 7 Russian.

1/1

USSR

OGANOVA, EVELINA, Scientific Secretary of the Scientific Council of the Academy of Sciences USSR for Problems in Genetics and Breeding

ALL-UNION COORDINATING CONFERENCE ON PLANT GENETICS

Tallinn IZVESTIYA AKADEMII NAUK ESTONSKOY SSR in Russian No 3, 1976
pp 252-256

[Abstract] The above-named conference was held in April 1975 to discuss the Five-Year Plan for joint research by various institutes of the Academy of Sciences USSR and All-Union Order of Lenin Academy of Agricultural Sciences on the "Genetic Basis of Breeding and Creation of New Plant Varieties". The plan includes the following sections (tasks): theoretical basis of selection and optimization of the selection process; patterns of intraspecific hybridization of crops; patterns of distant hybridization and selection of highly productive forms and species of crops; genetic, physiological, and biochemical nature of heterosis; genetic basis of the effect of ploidy and methods of obtaining and using polyploids; theoretical basis of experimental mutagenesis and creation of new varieties and selection material; physiological and genetic basis of crop productivity; theoretical basis of breeding varieties
1/2

USSR

OGANOVA, EVELINA, IZVESTIYA AKADEMII NAUK ESTONSKOY SSR No 3, 1976
pp 252-256

combining high quality and high yielding capacity; genetic basis of formation and inheritance of crop resistance to unfavorable environmental factors; genetic basis of increasing crop resistance to diseases and pests; genetics of apomixis and haploidy and methods of using them for breeding purposes; methods of using cell cultures to facilitate and accelerate genetic and selection processes; genetics of plant ontogeny; descriptive genetics. Individuals responsible for the various sections of the conference reported on the status of research and leading institutions and scientists working on the individual problems.

2/2

USSR

SHCHERBINOVSKAYA, T. N.

ANNUAL GENERAL MEETING OF THE DEPARTMENT OF GENERAL BIOLOGY, ACADEMY OF SCIENCES USSR

Moscow IZVESTIYA AKADEMII NAUK. SSSR. SERIYA BIOLOGICHESKAYA in Russian No 4, 1976 pp 628-631

[Abstract] Department secretary M. S. Gilyarov reported the following research achievements of the last year of the 9th Five-Year-Plan: elucidation of the genetic effects of environmental pollution on living organisms, including man, creation of a new variety of a winter wheat-couch grass hybrid exhibiting excellent baking qualities and drought resistance, creation of new chemical mutagens and supermutagens, use of chromosome engineering to obtain only male offspring from the silkworm, elaboration of a theory of insect population dynamics, development of a method for biological conditioning of soils to improve soil structure and accelerate the biological cycle of matter, new information on the life cycles of pathogenic helminths of useful animals, practical application of a new approach to the control of the dangerous cattle pest the horn fly, artificial breeding and creation of conditions for the
1/2

USSR

SHCHERBINOVSKAYA, T. N., IZVESTIYA AKADEMII NAUK. SSSR. SERIYA BIOLOGICHESKAYA No 4, 1976 pp 628-631

natural reproduction of herbivorous fishes in new habitats, discovery that drastic change in the insect fauna in the middle of the Cretaceous altered the terrestrial flora, generalization of long-term data on hydrobiological and hydrological conditions in the Volga and its reservoirs, and completion of work on a map of the vegetation of the European USSR. Two papers were read at the evening session: "Protection of the Plant World" by B. P. Kolesnikov and "Conservation and Replenishment of Marine Biological Resources" by A. V. Zhirmunskiy.

2/2

USSR/HUNGARY

UDC 575.24:633.16

GILYAROVSKAYA, T. T., Institute of General Genetics, Academy of Sciences USSR, Moscow; Botanical Institute, Hungarian Academy of Sciences, Budapest

STUDY OF THE EFFECT OF PRELIMINARY ETHYLENE IMINE TREATMENT OF BARLEY SEEDS ON THE MUTAGENIC EFFECT OF GAMMA IRRADIATION DURING STORAGE

Moscow GENETIKA in Russian No 7 1976, pp 18-23

(Text: English language abstract supplied by author) The effect of preliminary treatment of air dried barley seeds with ethylene imine (EI) at a concentration of $2,3 \cdot 10^{-3}M$ on the mutagenic action of gamma-irradiation at a dose of 10 kr was studied just after the irradiation and during storage of seeds within 125 days. Combined treatment with EI and gamma irradiation induced changes in the general mutability level and in the spectrum of structural chromosome mutations of stored barley seeds. Interaction between EI and gamma-irradiation is demonstrated. The effect of the combined treatment is higher in non-stored seeds and lower in stored seeds as compared

1/2

USSR/HUNGARY

GILYAROVSKAYA, T. T., GENETIKA No 7 1976 pp 18-23

with the additive effect. The additional treatment with gamma-rays increased the number of chromatid type aberrations as compared with the EI treatment alone. At the same time, preliminary treatment with EI and the following storage of treated seeds decreased the number of chromosome type mutations, reducing the effect of gamma-irradiation.

2/2

USSR

UDC 575.113:576.354.4:633.11

KOZLOVSKAYA, V. F., and KHVOSTOVA, V. V., Institute of Cytology and Genetics, Siberian Department, Academy of Sciences USSR, Novosibirsk

CYTOGENETIC ANALYSIS OF 56-CHROMOSOME TRITICALE MUTANTS. COMMUNICATION II.
CYTOGENETIC ANALYSIS OF SQUAREHEAD MUTANTS OF TRITICALE AND TRITICUM
AESTIVUM VARIETY LUTESCENS 62

Moscow GENETIKA in Russian Vol 12 No 6 1976 signed to press 16 Oct 76
pp 5-13

(Text: English language abstract supplied by authors) Analysis of two squarehead mutants, one obtained in 56-chromosome triticale and the other one obtained in common spring wheat (*T. aestivum*) variety Lutescens-62 was carried out. The expression of the mutant character in triticale varies depending both on genotype and on environmental conditions. The appearance of the squarehead character in the two forms studied is apparently associated with the doubling of a small section of the chromosome 5A containing the gene Q. In the triticale mutant meiosis is more regular, and the number of grains per spike is higher, than in the initial form of triticale. Figures 5; Tables 2; References 26: 8 Russian, 18 Western.
1/1

USSR

UDC 575.246

ALEKPEROV, U. K., ABUTALYBOV, M. G., and BAGIROVA, A. D., Institute of Botany imeni V. L. Komarov, Academy of Sciences Azerbaidzhan SSR, Baku

STUDIES OF THE MECHANISM OF ANTIMUTAGEN ACTION. I. SPECIFIC MODIFICATION
BY IONOL OF ABERRATIONS INDUCED BY DIFFERENT FACTORS

Moscow GENETIKA in Russian No 7 1976 pp 41-46

(Text: English language abstract supplied by authors) The capacity to decrease the frequency of chromosome aberrations, spontaneous or induced by ionizing radiation (gamma-rays) and alkylating compounds (ethylene imine), was established to be inherent in ionole (2,6-di-tertbutyl-4-methylphenole). *Crepis capillaris* was used as the experimental material. Ionole was particularly efficient with respect to aberrations induced by ethylene imine. The decrease of the frequency of spontaneous and induced aberrations did not affect their spectrum.

1/1

USSR

UDC 575.125:633.15

SOKOLOV, V. A., KOSTYUK, G. V., and SHUMNYI, V.K., Institute of Cytology and Genetics, Siberian Department, Academy of Sciences USSR, Novosibirsk

ACTIVITY OF AMYLOLYTIC ENZYMES IN CORN LINES AND HYBRIDS

Moscow GENETIKA in Russian Vol 12 No 6 1976 signed to press 11 Aug 75
pp 14-19

(Text: English language abstract supplied by authors) Amylolytic activity in endosperms and scutella in maize lines VIR 38, VIR 40, VIR 44, VIR 133, Odesskaya 301 and their heterozygous hybrids VIR 38 x VIR 40, VIR 40 x VIR 38, VIR 44 x VIR 40 and VIR 133 x Odesskaya 301 is studied. The amylase activity in the endosperm of hybrids VIR 38 x VIR 40 and VIR 40 x VIR 38 was observed to be higher than in the parental lines during the five days of germination. In the hybrids VIR 44 x VIR 40 and VIR 133 x Odesskaya 301 the amylase activity in scutella exceeded that in the parental lines on the 3rd, 4th, 5th days of seedling development respectively. A conclusion is drawn that the amylase activity is not sufficiently reliable as a criterion for the selection of heterotic hybrids. Figures 3; Table 1; References 15: 1 Russian, 14 Western.

1/1

Biochemistry

USSR

UDC 612.398.145.1.014.46:547.495.2

GORIN, A. I., SEREBRYANYI, A. J., ANTONOVA, L. V., ATKOCHYUNAYTE, V. K., KHARITONENKOV, I. G., ZOZ, N. N., and TSEYTLIN, P. I., Institute of Medical Genetics, Institute of Chemical Physics, Institute of Virology imeni D. I. Ivanovskiy, Academy of Medical Sciences USSR, Moscow

SOME ASPECTS OF STRUCTURAL DISTURBANCES IN DEOXYRIBONUCLEOPROTEIN COMPLEX DAMAGED BY N-NITROSO-N-METHYLUREA TREATMENT

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian Vol 81 No 6 Jun 76 signed to press 12 Aug 75 pp 674-677

(Text: English language abstract supplied by authors) The effect of deoxyribonucleoproteid (DNP) solubilization under conditions of the ionic strength of the medium approaching the physiological depended greatly, after the treatment with a mutagen N-nitroso-N-methylurea (NMU), on the NMU concentration. Apparently, for the change of DNA into a soluble state, the critical number of groups in the DNA and protein has to be modified. On the basis of the data 1/2

USSR

GORIN, A. I., SEREBRYANYI, A. M., ANTONOVA, L. V., ATKOCHYUNAYTE, V. K., KHARITONENKOV, I. G., ZOZ, N. N., and TSEYTLIN, P. I., BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY Vol 81 No 6, Jun 76 pp 674-677

obtained by circular dichroism and viscosimetry, a conclusion was drawn that after the NMU treatment the DNP complex became soluble in the solvents with the ionic strength approaching the physiological, chiefly as the result of labilization and dissociation of DNA-protein bonds. Figures 3; Table 1; References 7: 5 Russian, 2 Western.

2/2

USSR

KOCHEREZHKIN, V. G.

ANNUAL GENERAL MEETING OF THE DEPARTMENT OF BIOCHEMISTRY, BIOPHYSICS, AND CHEMISTRY OF PHYSIOLOGICALLY ACTIVE COMPOUNDS, ACADEMY OF SCIENCES USSR

Moscow IZVESTIYA AKADEMII NAUK SSSR. SERIYA BIOLOGICHESKAYA in Russian
No 4, 1976 pp 625-628

[Abstract] Among the research achievements of the last year of the 9th Five-Year-Plan reported by department secretary A. A. Bayev at the annual general meeting held in March 1976 were: progress in the study of the origin of life, elucidation of the structure of the enzyme glutamic-oxaloacetic transaminase, determination of the tridimensional structure of the protein enzyme pepsin, spatial structure of the plant protein leghemoglobin, chemical synthesis of the polypeptide chain of the natural protein alpha-bungarotoxin (a powerful inhibitor of nerve impulse transmission), functional study of ribosomes, establishment of the general principles of organization of molecules of the nuclear precursors of information-RNA, advances in membrane biology, experimental proof of a new function of proteins as generators of

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USSR

KOCHEREZHKIN, V. G., IZVESTIYA AKADEMII NAUK SSSR. SERIYA BIOLOGICHESKAYA
No 4, 1976 pp 625-628

electric current, methods of isolating, from microorganisms, highly purified preparations of enzymes participating in the genetic processes, utilization of oxidized hydrocarbon derivatives (methyl alcohol, ethyl alcohol, organic acids) as raw material for fodder protein and for food purposes, elaboration of a comprehensive theory of photosynthesis, and publication of a 1:10,000,000 world soil map and a soil map of the Central Asian republics.

2/2

USSR

UDC 582.282.23.095:577.164.12:575.24

SHAVLOVSKIY, G. M., FEDOROVICH, D. V., and ZVYAGIL'SKAYA, R. A., Lvov Branch, Institute of Biochemistry, Academy of Sciences, Ukrainian SSR imeni A. V. Palladin and Institute of Biochemistry imeni A. N. Bakh, Academy of Sciences USSR

FLAVINOGENOUS MUTANT OF THE YEAST *PICHIA GUILLIERMONDII* WITH DAMAGED TRANSPORT OF IRON

Moscow MIKROBIOLOGIYA in Russian Vol 45, No 2, mar/Apr 76, signed to press 2 Jul 76, pp 313-318

[Abstract] An ultraviolet-induced mutant of the yeast *Pichia guilliermondii* produced excess riboflavin in the presence of a high-iron medium. Total and nonhemin iron, cytochrome c and catalase activity were lower in mutant cells. Riboflavin synthetase activity was higher. Iron content increased in mutant cells on media containing citric acid, siderochromes of *Klebsiella aerogenes*, *Neurospora crassa*, *Rhodotorula glutinis*, cultural broth of *Pichia ohmeri* or autolysate of brewer's yeast, whereas flavinogenous activity decreased. Flavogenesis is not controlled by nonhemin iron of the respiratory chain since rotenone-inhibited intact mutant cells produced excess riboflavin.
1/2

USSR

SHAVLOVSKIY, G. M., FEDOROVICH, D. V. and ZVYAGIL'SKAYA, R. A., MIKROBIOLOGIYA Vol 45, No 2, Mar/Apr 76 pp 313-318

Excess riboflavin production by the mutant is a recessive trait. Tables 3; figures 3; references 21: 5 Russian, 16 Western.

2/2

USSR

UDC 612.821.6:612.821.7

VORONIN, L. G., corresponding member, Academy of Sciences USSR,
KONOVALOV, V. F., and FEDOROV, A. U., Institute of Biophysics, Academy of
Sciences USSR, Pushchino, Moscow Oblast

SOME DATA ON CHANGE IN EEG RHYTHMS OF MAN DURING ELECTROSTIMULATION
(ELECTROSLEEP)

Moscow DOKLADY AKADEMII NAUK SSSR in Russian No 1, 1976, signed to press
23 Feb 76, pp 230-232

[Abstract] Four healthy young men received 5 sessions of electrosleep, each session lasting 45 minutes during which the electrical activity of the occipital region was recorded. After 10 to 30 minutes of electrostimulation, the delta and theta rhythms intensified, constituting 140 to 150% of the base-line values, while alpha activity decreased 15 to 20% and remained at that level until the electrosleep apparatus was turned off. At the end of a session, the delta and theta oscillations lost an average of 20 to 25% of the energy exhibited earlier while the energy of the alpha rhythm increased 50 to 55%. Thus, there was an inverse relationship between the three rhythms: the

1/2

USSR

VORONIN, L. G., KONOVALOV, V. F. and FEDOROV, A. U., DOKLADY AKADEMII NAUK
SSSR No 1, 1976 pp 230-232

alpha rhythm decreased when the delta and theta rhythms increased and it increased when the latter weakened. These changes are indicative of the depth of induced sleep and possibly of the efficacy of combination therapy that includes the use of electrosleep. The authors comment briefly on the apparently favorable effect of electrosleep on short-term memory. References 5: 3 Russian, 2 Western.

2/2

POPOVA, A. M. and FAYTEL'BERG-BLANK, V. R., Department of Pathological Physiology and Biophysics, Odessa Agricultural Institute

RESORPTION OF STREPTOMYCIN FROM PLEURAL CAVITY AS A FUNCTION OF INDUCTOTHERMY CURRENT

Kiev FIZIOLOGICHNIY ZHURNAL in Russian Vol 22, No 4, Jul/Aug 76 pp 546-548

[Abstract] Streptomycin was injected into the pleural cavity of albino rats and the speed of its absorption by the blood and its accumulation in lungs, kidneys, liver, and spleen were observed during application of 120, 160, 200 and 280 mA current for 10-20 min. The concentration of streptomycin in the blood reached, on the average, 16.45% in 30 min. after injection of it into the pleural cavity when 120 mA current was applied for 10 min., while it was only 13.74% (norm) without the current application. Its concentration in liver, kidneys and lungs was higher than normal but remained unchanged in the spleen. The level of streptomycin in the blood reached 18.04% (norm 13.23%, $p < 0.05$) in 20 min. after injection when 160 mA current was applied for 10 min. This increase, on the average, amounted to 19.6% (norm 11.96%) in 15 min. after injection when 200 mA current was applied for 10 min. At the same 1/2

USSR

POPOVA, A. M. and FAYTEL'BERG-BLANK, V. R., FIZIOLOGICHNIY ZHURNAL Vol 22, No 4, Jul/Aug 76 pp 546-548

time, the accumulation of it in liver, kidneys, spleen and lungs reached, on the average, 22.27, 28.55, 15.12 and 33.01% (norm 13.43, 12.18, 10.45, 11.70%), respectively. A maximum absorption of streptomycin from the pleural cavity was observed with the application of 280 mA current for 10 min; concentration of it in liver, lungs, spleen and kidneys was 19.77, 33.24, 13.59 and 35.58%, respectively. The speed of absorption of streptomycin from the pleural cavity also increased when the application time of the 120 mA current was increased to 20 min; accumulation of streptomycin in vital organs was also higher, but not as high as in the case of 200 and 280 mA current applied for 10 min. Figures 1; tables 1, references 16: 14 Russian, 2 Western.

2/2

USSR

RUSYAYEV, V. F., KUKSINSKIY, V. YE., and SHEFTEL', I. YE., Chita State Medical Institute

EFFECT OF PHYSICAL FACTORS ON THE ELECTROKINETIC PROPERTIES OF FORMED BLOOD ELEMENTS

Moscow BIOFIZIKA in Russian Vol 21, No 4, Jul/Aug 76, signed to press 17 Dec 74, pp 679-683

[Abstract] Changes in the surface properties of canine and human erythrocytes and thrombocytes were studied after they were exposed in vitro to several physical factors: constant magnetic field (300 oe), sound oscillations (40 db, 50 to 20,000 Hz), and electromagnetic field (3 v/cm, 50 to 20,000 Hz). In some experiments, dogs were exposed to a variable electric field (0.05 to 0.2 mA/cm², 50 to 20,000 Hz). Canine erythrocytes exhibited the highest electrophoretic mobility. All 3 physical factors decreased the electrophoretic mobility of the blood cells, both human and canine. In the in vivo experiments, the decrease was greatest in the 500 to 100 Hz range. The decrease in electrokinetic potential is assumed to be due to local destruction

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USSR

RUSYAYEV, V. F., KUKSINSKIY, V. YE and SHEFTEL', I. YE, BIOFIZIKA Vol 21, No 4, Jul/Aug 76, pp 679-683

of the cell membranes and resulting release of phospholipids, thereby intensifying blood coagulation and, by the weakening of the electrical repulse force, facilitating the aggregation of formed elements and, consequently, clumping of cells in the bloodstream. Table 1; references 16: 9 Russian, 7 Western.

2/2

SAPRYKIN, V.A., and NIKITIN, YU. K., Institute of Evolutionary Physiology and Biochemistry imeni I.M. Sechenov, Academy of Sciences USSR, Leningrad

PRINCIPLE OF HUMAN AUDITORY ANALYZER INVARIANCE RELATIVE TO SCALE CHANGE IN THE DIFFERENTIATION OF TONAL IMPULSE SIGNALS

Moscow DOKLADY AKADEMII NAUK SSSR in Russian Vol 229 No 1 Jul-Aug 1976 signed to press 19 Dec 75 pp 244-246

(Abstract) The authors continue a study (Biofizika 13, 1085, 1968, and subsequent referenced articles) of perception efficiency as dependent on the frequency-time indeterminance of the signal, i.e., on the number of its waves rather than on the frequency or duration of the sound separately. The technique used has been described in the earlier reports. The sound stimulus is defined mathematically as the sum of two signals:

$$\bar{V}\alpha s(\alpha t) + \bar{V}\alpha\mu s(\alpha\mu(t-\tau)), \quad (1)$$

1/2

USSR

SAPRYKIN, V.A., et al, DAN SSSR, 229, 1, Jul-Aug 76, pp 244-246

where alpha is the parameter defining a time-scale change, mu the parameter defining resolution of a second signal with respect to the first, tau the parameter defining the interval between the first and second signal, s(t) the signal form. The capacities of the human auditory analyzer to distinguish tonal-impulse signals and to detect them against a noise background are invariant to change of scale in one and the same range of changes of parameter alpha. The maximum resolving capacity of the analyzer is reached in the neighborhood of 256 waves of the signal, in contrast to perception effectiveness during detection of tonal-impulse signals where the maximum is at 42 impulse waves.

2/2

USSR

612.115:615.849.19

KUDRYASOV, B. A., PASTOROVA, V. YE., BAZAZ'YAN, G. G., LYAPINA, L. A.,
UMAROVA, B. A., BASKOVA, I. P., LYUBARSKAYA, I. I., PODOL'SKAYA, O. V.,
and STRUKOVA, S. M., BIOLOGICAL FACULTY, Department of Human and Animal
Physiology (Moscow University)

CHANGE IN FUNCTION OF THE ANTICOAGULATING SYSTEM UNDER THE ACTION OF
PULSED NEODYMIUM LASER RADIATION OF THE REGION OF THE MEDULLA OBLONGATA
AND MESENCEPHALON OF WHITE RATS

Moscow VESTNIK MOSKOVSKOGO UNIVERSITETA, BIOLOGIYA, POCHVOVENDENIYE in
Russian No 2 Mar-Apr 76 signed to press 6 May 75 pp 7-12

(Text: English language abstract supplied by authors) Depression of the
function of the anticoagulating system after pulsed neodymium laser irradi-
ation ($P=10 \text{ J/cm}^2 \times 3$) of the region of medulla oblongata and mesencephalon
in rats was established. The enzymatic and non-enzymatic fibrinolytic
activity and the level of heparin in blood of experimental animals were
decreased. 37% irradiated rats perished from thrombosis after the intraven-
ous injection of tissue thromboplastin. In the control group of animals
the mortality was about 5% after injection of the same doses of thrombo-
plastin. Tables 4; References 15: 8 Russian, 7 Western.
1/1

Environmental and Ecological Problems

USSR

UDC 634.0.181.228

REVA, M. L., FILATOVA, R. YA

THE INFLUENCE OF TREES AND SHRUBS ON MICROCLIMATE AND SANITARY STATE OF AIR LAYERS CLOSE TO THE GROUND SURFACE AT INDUSTRIAL SITES OF METALLURGICAL WORKS

Moscow EKOLOGIYA in Russian No 3, 1976, signed to press 5 May 75, pp 89-91

[Abstract] The effect of trees and shrubs on working conditions was investigated at metallurgical works in the Ukraine. Indices used included air temperature and humidity, sulfuric anhydride, carbon monoxide and nitrogen oxide content. Indices were measured at varying distances from the sources of the industrial waste. In areas with trees and shrubs, air temperature was 3-5 degrees lower and relative humidity 8-10 degrees higher than out in the open. The level of industrial waste given off as gas was consistently less prevalent in areas with trees and shrubs than out in the open. Trees and shrubs were concluded to be essential for the health and well-being of the workers. Tables 2; references: 5 Russian.

1/1

Epidemiology

USSR

UDC 616.853.8+616.988.25-002.954.2

SHAPOVAL, A. N., GARNISHINA, M. F., Department of Nervous Diseases, Perm Medical Institute

DEVELOPMENT OF KOZHEVNIKOV'S EPILEPSY IN RUSSIAN TICK-BORNE ENCEPHALITIS

Kiev VRACHEBNOYE DELO in Russian No 7, Jul 76 pp 116-120

[Abstract] The development of Kozhevnikov's epilepsy was observed in the Perm region in 0.91 percent of patients with a past history of Russian tick-borne encephalitis. The incidence of this form of epilepsy was observed in severe encephalitis at various periods of convalescence. Local hyperkinesias were most frequently the first manifestation of formation of the epileptic syndrome. In 50 percent of the patients, the syndrome had a stable character; in 15.3 percent, improvement was seen and sometimes disintegration of the syndrome; 33.5 percent of the patients showed a progressive deterioration, advanced symptoms of local affection of the nervous system and development of epileptic states resulting in fatal outcomes. Table 1; references: 21 Russian.

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Food Supply

USSR

UNDERWATER GARDENS

Moscow SOVETSKAYA TORGOVLYA in Russian 29 May 76, p 3

[Text] Nakhodka (Tass). Along the shorelines of the Sea of Japan, washing on Primorskiy Kray [Maritime Province] new, so-called underwater gardens are being built. They are intended for the raising of sea cabbage--Laminaria--a valuable raw material for the food industry. It is expected that in the immediate years ahead the area devoted to such underwater gardens will increase to 300 hectares. Scientists and practical workers are resolving problems in the artificial raising of other similar inhabitants of the ocean depths.

1/1

Hydrobiology

USSR

UDC 628.394:597

MAZMANADI, N. D., KOVALEVA, G. I., KOTOV, A. M., BAZHASHVILI, T. R., DIASAMIDZE, N. M., and ZAMBAKHIDZE, N. P., The Georgian Branch, All-Union Scientific Research Institute of Sea Fisheries and Oceanography

THE EFFECTS OF PETROLEUM PRODUCTS ON BLACK SEA HYDROBIONTS

Moscow RYBNOYE KHOZYAYSTVO in Russian No 5, May 76 pp 24-28

[Abstract] Studies were carried out on fish (*Spicara smaris*, 10-13 cm), mollusks (*Mytilus galloprovincialis* 4-5 cm), and crustaceans (*Leander adspersus* 4-5 cm); developing roe and larvae of *Platichthus flesus luscus* were also tested. Specimens at various stages of development were placed in tanks of 12 and 80 liters and observed as they were subjected to specific concentrations of petroleum products in the water. The maximum length of time was 40 days, and measurements of blood substances were taken at intervals of 7-10 days. Low concentrations of 0.01 mg/l resulted in no statistically significant variation from the control, but with other, higher concentrations, clear toxic effects were registered. The results indicate that toxic effects can be expected where petroleum products are dissolved in water at levels of more than 0.05 mg/l. Thus the maximum allowable concentration of dissolved petroleum products in the Black Sea should not exceed 0.01 mg/l. Tables 3.
1/1

USSR

UDC 639.2.053,8"405"

MALKIN, YE. M., candidate of biological sciences, All-Union Scientific Research Institute of Sea Fisheries and Oceanography

PREDICTING THE NUMBERS OF FISH GENERATIONS ON THE BASIS OF CATCHES OF YOUNGER AGE GROUPS

Moscow RYBNOYE KHOZYAYSTVO in Russian No 5, May 76 pp 15-17

[Abstract] The biostatic method of estimating catches and other, more direct methods, provide satisfactory results where fluctuations in population are not great. For species and zones with greater variations, the method presented by the author is based on the notion of a direct relation between the quantity of maturing fish and the overall fish population. It includes preparation of a biostatic table and calculation of the catch in successive generations, evaluation of the correlation between these data, and evaluation of the significance of regressions in the correlation. The aim of the study was to utilize previous information to develop methodology for predictions for those species of fish where commercial catch is determined by augmentation through maturing of generations. The best results might be anticipated where commercial operations have already been established. Table 1, figures 2.
1/1

Marine Mammals

USSR

KRASNOSEL'SKIY, S.

ON THE APPETITE OF WHALES

Moscow KHIMIYA I ZHIZN' in Russian No 3, Mar 76 pp 122-124

[Abstract] The role of whales in the ocean food chain is briefly examined. In 1970 A. G. Tomilin calculated that whales and similar mammals consumed at least 2,320,000 tons of plankton, crustaceans, squid, and fish daily. The shares of certain species of marine mammals in this total are examined. Large whales only account for 170,000 tons, and sperm whales consume 450,000 tons daily. The remaining daily consumption is not discussed. The theme of discussion is interrupted by a short description of an alleged case of a latter day Jonah. This is refuted. As consumers of krill, whales have helped control this predator upon plankton. As phytoplankton account for 75% of the oxygen produced by the world plant population, the control of krill is vital. The reduction of the whale population has had an effect on this ecological control. Dolphins, porpoises, and other mammals are also in danger, primarily from accidental netting during tuna and salmon fishing operations in the Pacific.

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USSR

KRASNOSEL'SKIY, S., KHIMIYA I ZHIZN' No 3, Mar 76 pp 122-124

In addition, there is a problem of controlling the fishery in the Black Sea. A survey in 1974 indicated that there were only about 233,000 dolphin left in that Sea. The USSR, Bulgaria, and Romania have declared a moratorium on this fishery, but Turkey has not. Figures 3.

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USSR

SERGEYEV, B. F.

THE BLUE WONDER

Moscow KHIMIYA I ZHIZN' in Russian No 3, Mar 76 pp 119-122

[Abstract] A general survey of the ecology of whales, especially of the blue whale (*Balaenoptera musculus*). The life cycle, especially the raising of young, is described. It is perhaps too late to learn about whales as there are now so few. Whales have several predators and parasites. The latter are examined in some detail. These include crustaceans and worms which dig into skin. Whale hunting, although controlled by an international commission, has adversely affected the population. The long reproductive cycle creates conditions of slow population growth. It will take many years to return the population to a size eliminating the danger of extinction. Commercial whale farming operations, and even whale dairy operations, are recommended. A female whale can produce 600 liters of 53% fat-content milk daily. In 80 days this would produce as much fat as rendering of an adult. No details of such operations are given. Special emphasis is given to the relationship between whales, plankton, and the small crustaceans feeding upon the plankton. Excessive
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USSR

SERGEYEV, B. F., KHIMIYA I ZHIZN' No 3, Mar 76 pp 119-122

killing of whales could disturb this. This article is a popular presentation, primarily devoted to description, and no analysis is presented. Figures 3.

2/2

USSR

UDC 576.852.1

ISMAILOVA, T. KH., Tashkent Order of the Red Banner of Labor State University imeni V. I. Lenin

THE NATURE OF ACTINOMYCETES THAT DESTROY RESIN

Tashkent UZBEKSKIY BIOLOGICHESKIY ZHURNAL in Russian No 3, 1976 signed to press 25 Dec 75 pp 13-15

[Abstract] The investigators gathered 259 strains of Actinomycetes from the rhizospheres of resin-bearing plants and placed them on agar cultures on the surface of a rubber sheet. The appearance of clarified zones indicated destruction of the rubber. Morphological culture properties were studied for the active fungi. Soils of the Tashkent area yielded practically all types of actinomycetes, classified by color, while the Leningrad area had chiefly white and gray strains. The most destructive came from brown strains of the southern group. A wide range of carbon sources were used and all supported good growth. Brown strains similar to the species *Actinomyces fuscus* were the most active resin-destroying types to be found in both northern and southern soils. Tables 2, references 10: 5 Russian, 5 Western.

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USSR

UDC 576.8:577.472(265+267)

MITSKEVICH, I. N., and KRISS, A. YE., Institute of Microbiology, Academy of Sciences USSR

TOTAL NUMBER, BIOMASS AND PRODUCTION OF BACTERIA IN WATER OF SUBTROPIC AND EQUATORIAL-TROPIC REGIONS OF THE WORLD OCEAN

Moscow MIKROBIOLOGIYA in Russian Vol 45, No 2, Mar/Apr 76 signed to press 23 May 75 pp 350-357

[Abstract] Capillary microscopy was used to determine total number and biomass of 168 samples of bacteria from different levels (0-5000 m) of the subtropic and equatorial regions of the central Pacific Ocean (135 and 150 degrees W.) and the western half of the Indian Ocean (65 degrees E.) One-ml water samples contained tens of thousands to hundreds of thousands of cells in most cases, and biomass ranged from more than 10 to less than 100 mg/m³. Biomass production per day was also measured. High bacterial concentrations occurred at large depths as well as near the surface. In the euphotic layer (0-200 m) the mean value of bacterial biomass was similar to that of phytoplankton in mesotrophic waters of tropic divergences and subpolar zones. Vertical distribution of microorganisms was similar to that of saprophytic bacteria of an earlier study. Tables 8, figures 2, references: 7 Russian.

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EAST GERMANY

OPITZ, B., senior physician, and SCHAU, Gudrun, graduate biologist, Institute of General Hygiene (Director: HORN, H., medical counsellor, professor, Dr of Medical Sciences) at the Medical Academy, Erfurt

EXPERIMENTAL STUDIES ON THE INFECTION HAZARD WITH INJECTIONS ADMINISTERED WITH THE JET-INJECTOR

East Berlin DAS DEUTSCHE GESUNDHEITSWESEN in German Vol 31 No 24, Jun 1976 signed to press 10 Jan 76 pp 1138-1142

[Abstract] The authors describe the design, construction, operation, performance and applications of the jet injector (Model K3 Hypospray R Jet-Injector made by the Scherer Corporation in Detroit, which is the type used in East Germany). Experimental studies were carried out on the infection hazard which may be introduced with this instrument which is not sterilized between consecutive uses. The studies were carried out by means of contact infection simulation using skin samples and various nutrients and micro-organisms. It was found that the jet spray might carry germs from the skin
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EAST GERMANY

OPITZ et al DAS DEUTSCHE GESUNDHEITSWESEN Vol 31 No 24, Jun 76 pp 1138-1142

surface into deeper tissue layers. There may be blood or tissue particles left behind on the injector nozzle after an injection. This constitutes a hazard under some conditions. It was not established whether the pressure of the spray creates some effects on the patient's skin. The findings were discussed in connection with the concern about the possibility of inoculation hepatitis. A preliminary judgment indicates that the hazard of inoculation hepatitis is higher than the Hughesian deposition risk. Tables 3; Figures 3; References 7: 5 German and 2 Western.

2/2

EAST GERMANY / WEST GERMANY

FRANK, H. K., professor, Dr of natural sciences, Federal Research Institute for Nutrition, Karlsruhe, West Germany

THOUGHTS ON THE MAXIMUM PERMISSIBLE LIMITATION OF MYCOTOXINS IN GENERAL AND AFLATOXINS IN PARTICULAR

East Berlin DAS DEUTSCHE GESUNDHEITSWESSEN in German Vol 31 No 21, May 76
pp 961-964

[Abstract] In his lecture presented at the 29-31 May 1975 conference of the East-German Association of Medical Mycology, held in Halle, the author discussed the regulations governing the maximum permissible limits of mycotoxins and aflatoxins in various countries, the "no-effect" level for Aflatoxin B₁, and the transfer of mycotoxins of animal origin into foods. As of 1 January 1976, the maximum permissible concentration of Aflatoxin B₁ in animal feed in West Germany is between 0.02 and 0.05 mg/kg (parts per million). This is expected to ensure that no hazardous amounts will be found in milk, meat, and eggs. Figure 1, Tables 2; References 17: 10 German and 7 Western.

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Military Medicine

YUGOSLAVIA

PETROVIC, Dragoljub, Doctor, Medical Corps Colonel, Institute for Hygiene, Belgrade

OCCUPATIONAL HEALTH PROBLEMS IN AN OPERATIONAL ARMY

Belgrade NARODNO ZDRAVLJE in Serbo-Croatian No 3-4, Mar-Apr 75 pp 90-93

[Abstract] Today's army is exposed to many hazards of both mechanical and chemical nature. Among the former are: noise, infra and ultra-sonic sounds, vibrations, abnormal atmospheric pressure, various forms of radiation; among the latter are: exhaust and gun powder gases, fuels and lubricants, organic solvents and diluents, missile propellents, chemical warfare. All these harmful elements will be more intensified during a war. For this reason army medicine must follow closely any changes in armament and war technology; study the environmental conditions of war operations as well as the health condition of the general population; undertake preventive measures, and promote health education. A close cooperation between occupational medicine and all the departments and special services of the armed forces is necessary for the realization of the above.

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Molecular Biology

USSR

UDC 547.963.3

KHRISTOVA, M. L., YAROSLAVTSEVA, N. G., BUSSE, T. L., KHARITONENKOV, I. G., and BUKRINSKAYA, A. G., Institute of Virology imeni D. I. Ivanovskiy, Academy of Medical Sciences USSR, Moscow

PHYSICAL CHEMICAL PROPERTIES OF SENDAI VIRUS RNA. II. INFLUENCE OF IONIC STRENGTH ON RNA THERMOSTABILITY

Moscow MOLEKULYARNAYA BIOLOGIYA in Russian Vol 10 No 4, Jul-Aug 76 signed to press 22 Apr 75 pp 785-791

(Text: English language abstract supplied by authors) The melting temperature and the width of the melting range of double-stranded portions of Sendai virus RNA after isolation from virus particles were examined as a function of ionic strength and pH. It has been demonstrated that the melting temperature is a linear function of the logarithm of sodium ion concentration (within the range 10^{-1} - 10^{-4} M), with a slope of 11.5°C . The width of the melting interval increases insignificantly with a decrease $1/2$

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KHRISTOVA, M. L., YAROSLAVTSEVA, N. G., BUSSE, T. L., KHARITONENKOV, I. G., and BUKRINSKAYA, A. G. MOLEKULYARNAYA BIOLOGIYA Vol 10 No 4 Aug 76 pp 785-791

of the ionic strength. The change of pH from 5 to 8 does not exert any effect on the melting temperature and melting interval. The level of purification of RNA preparations and the presence of EDTA in solution have been found to affect strongly the pattern of the dependence of the melting temperature on a logarithm of sodium ion concentration, in particular at low ionic strengths. Figures, 4; Table, 1; References 13: 3 Russian, 10 Western.

Pharmacology

USSR

UDC 615.217.32.015.43:612.82.015.14

TONKOPIY, V. D., and PROZOROVSKIY, V. B., Military Medical Academy imeni S. M. Kirov, Leningrad

STUDY OF THE FEATURES OF INTERACTION OF GALANTAMINE WITH MOUSE BRAIN ACETYLCHOLINESTERASE IN VIVO

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian Vol 82 No 7 Jul 76 signed to press 29 Oct 75 pp 823-825

(Text: English language abstract supplied by authors) Armine treatment of mice against the background of preliminary galanthamine injection diminished the inhibition of acetylcholinesterase of the brain caused by a reversible inhibitor. This effect was connected with acetylcholine accumulation and the displacement by it of galanthamine from the active centers of the enzyme. Thus, a competitive character of galanthamine-acetylcholinesterase interaction was shown in vivo. Figure 1; Table 2; References 4: 3 Russian, 1 Western.

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USSR

UDC 616-006-07:616.15-097.2:547.672.7

KOROSTELEVA, T. A., KLYUCHAREV, V. B., MEL'NIKOV, R. A., and BELOKHVOSTOVA, A. T., Scientific Research Institute of Oncology imeni N. N. Petrov, Ministry of Health USSR, Leningrad

DETECTION OF AN ANTIGEN CONTAINING 3-HYDROXYANTHRANYLIC ACID IN THE BLOOD SERUM OF PATIENTS WITH TUMORS OF VARIOUS LOCALIZATIONS

Moscow BYULLETEN' EKSPERIMENTAL'NOY BIOLOGII I MEDITSINY in Russian Vol 82 No 7 Jul 76 signed to press 8 Dec 75 pp 850-852

(Text: English language abstract supplied by authors) An unusual antigen containing a carcinogenic tryptophan metabolite--3-hydroxyanthranilic acid as a hapten (3-HAA-antigen) was found to be present in the blood serum in the overwhelming majority of patients with malignant tumors of various stages and localizations. The 3-HAA-antigen was rarely determined in the patients with nonmalignant diseases and was not detected in the blood serum of healthy donors and patients with benign tumors. The significance of the data obtained for the diagnosis of the tumor process, irrespective of its localization, is discussed. Figure 1; Table 1; References 6: 3 Russian, 3 Western.

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USSR

UDC 616.89-008.441.13-036.12-085.214

IVANETS, N. N., IGONIN, A. L., and SAVCHENKO, L. M., Central Scientific Research Institute of Forensic Psychiatry imeni Professor V. P. Serbskiy, Moscow

EXPERIENCE IN USE OF KARBIDINE IN TREATMENT OF CHRONIC ALCOHOLISM PATIENTS

Moscow SOVETSKAYA MEDITSINA in Russian No 7 Jul 76 signed to press 20 Nov 75 pp 120-124

(Text: English abstract supplied by authors) Carbidine was given to 40 patients with chronic alcoholism, 27 of whom were in the II, 13--in the II-III and III stages of the disease. With the use of carbidine the abstinence symptoms were noted to diminish in a particularly spectacular way, the duration of abstinence decreasing quite noticeably (down to 1-2 days). Carbidine was administered to 29 patients for one year as maintenance therapy. A control group, composed according to the principle of "doubles", 1/2

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IVANETS, N. N., IGONIN, A. L., and SAVCHENKO, L. M., SOVETSKAYA MEDITSINA No 7 Jul 76 pp 120-124

served in appraising the effectiveness of the treatment. The effect of the latter was judged by the duration of remissions. Among carbidine advantages were found to be its ability to suppress the craving for alcohol, to influence affective disorders, and to correct the patients' behavior. Low toxicity of the drug, the absence of any adynamic effect, good tolerance, greatly broaden indications for its use. An inference is drawn on the effectiveness of carbidine in dealing with chronic alcoholism, which in a number of cases proves superior to that of other psychotropic agents. References: 3 (Russian).

2/2

Physiology

USSR

UDC 616-092:616.891

SINITSKIY, V. N. and USHERENKO, L. S., Department of Pathology of Higher Nervous Activity, Institute of Physiology imeni A. A. Bogomolets, Academy of Sciences, UkrSSR, Kiev

PECULIARITIES OF CHANGES IN BIOELECTRICAL ACTIVITY OF BRAIN, VASCULAR AND VEGETATIVE TONUS, AND METABOLISM OF BIOGENIC AMINES IN THE PRESENCE OF SOMATOGENIC DEPRESSION

Kiev FIZIOLOGICHNYY ZHURNAL in Russian Vol 22, No 4, Jul/Aug 76 signed to press 3 Feb 75 pp 457-464

[Abstract] No correlation was found between the brain bioelectric activity, vascular and vegetative tonus, excretion of catecholamines and psychopathological picture in patients suffering from somatogenic depression. Administration of adrenaline or aminazine to these patients intensified still further the dissociation of the indices of the functional state of the body. Figures 2, tables 1, references 39: 22 Russian, 17 Western.

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USSR

YUGANOV, YE. M. and SOLODOVNIK, F. A.

PATHOGENESIS OF MOTION SICKNESS

Moscow IZVESTIYA AKADEMII NAUK SSSR. SERIYA BIOLOGICHESKAYA in Russian No 4, 1976 pp 485-494

[Abstract] Motion sickness is a manifestation of a pronounced parasympathetic crisis caused by prolonged stimulation of some afferent systems (vestibular, visual, auditory, interoceptive) in individuals with a constitutional or acquired (due to infection or reflexes from diseased organs or systems) insufficiency of the limbic-reticular complex in the brain. The pronounced autonomic reactions to prolonged vestibular stimulation are regarded to some extent as protective. An individual predisposed to motion sickness upon exposure, for example to acceleration finds it necessary to neutralize its effect. He does so chiefly by losing interest in the environment and limiting his motor activity, thereby helping to overcome the disagreeable sensations that are intensified by moving his head. Some of the practical implications of this theory are discussed. References 79: 57 Russian, 22 Western.

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USSR

UDC 612.014.42

SHABAN, V. M., Institute of Physiology imeni A. A. Bogomolets Academy of Sciences of the Ukrainian SSR, Kiev

THE ELECTROPHYSIOLOGY OF THE HIPPOCAMPUS

Moscow USPEKHI FIZIOLOGICHESKIKH NAUK in Russian Vol 7, No 3, Jul/Sep 76
pp 57-81

[Abstract] The author surveys experimental data related to the electrophysiology of the hippocampus in domestic and foreign literature, with additional attention to studies of features of the morphology of the hippocampal structure. Careful analysis is offered of electrophysiological properties of hippocampal neurons, possible mechanism of their interaction, and stimulation and suppression. The effects of certain neurological activity on the electrical activity of the hippocampus is also investigated. Electrohippocampograms and potential reactions are considered, along with hypotheses concerning the nature of such phenomena. The significance of this data is assessed for understanding the functional organization of the hippocampus, as well as for investigating certain fundamental problems of electrophysiology in general. The discussion
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USSR

SHABAN, V. M., USPEKHI FIZIOLOGICHESKIKH NAUK Vol 7, No 3, Jul/Sep 76 pp 51-81

of electrical activity of hippocampal neurons is divided into considerations of pyramidal neurons, non-pyramidal neurons, and the interaction of hippocampal neurons. Results indicate generally that synaptic processes are involved that originate in dendrites and other nerve bodies, and that various nerve components are involved. Investigations currently do not permit definite conclusions concerning the functional importance of the hippocampus. References 199, 28 Russian, 171 Western.

2/2

USSR

UDC 612

MEYERSON, F. Z., The Institute of General Pathology and Pathophysiology,
Academy of Medical Sciences of the USSR, Moscow

LONG-TERM ADAPTATION OF THE HEART TO HEAVY LOADING

Moscow USPEKHI FIZIOLOGICHESKIKH NAUK in Russian Vol 7, No 3, Jul/Sep 76
pp 34-56

[Abstract] This survey of current research is devoted to a basic problem of adaptation, since the heart's ability to increase its functioning is often the key to the adaptability of the entire organism. There are two types of adaptation discussed, training of the heart in a healthy organism, and compensatory hypertrophy in diseased cardiovascular systems. At the core of both processes lies activation of nucleic acid synthesis and protein synthesis. The results of adaptation, however, vary. The work of the trained heart per unit of mass can be increased, while in compensatory changes the work per unit of mass is reduced. The survey, which involves the function of RNA and DNA, is organized into sections including compensatory hypertrophy, training of the heart, signalling which activates the genetic apparatus as heart function is

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USSR

MEYERSON, F. Z., USPEKHI FIZIOLOGICHESKIKH NAUK Vol 7, No 3, Jul/Sep 76, pp 34-56

increased, and a summation. Internal divisions in each section refer to the various levels of functioning, that of the organ, the tissue, the cell, intracellular materials, and molecules. Conclusions indicate that a drop in phosphorous compounds in myocardia, whatever the cause, activates synthesis of nucleic acids and proteins and heart hypertrophy. Isometric hyperfunction seems to be the key to this activation, and the signal is related to RNA synthesis. Tables 2; figures 2, references 84: 31 Russian, 53 Western.

2/2

USSR

KHRUSHCHOVA, V. M.

ANNUAL GENERAL MEETING OF THE DEPARTMENT OF PHYSIOLOGY, ACADEMY OF SCIENCES USSR

Moscow IZVESTIYA AKADEMII NAUK. SERIYA BIOLOGICHESKAYA in Russian No 4, 1976 pp 631-632

[Abstract] Secretary P. G. Kostyuk reported on the work of the department in 1975, the last year of the 9th Five-Year-Plan, at its annual general meeting held in March 1976. The following were the main research achievements discussed: completion of long-term studies on cortical projection of visceral systems and determination of the principles controlling these systems, analysis of spatial synchronization of the activity of various cortical regions and their role in spreading excitation and eliciting conditioned reflexes, new information on the mechanisms of short-term and long-term memory and mediation on the mechanisms of short-term and long-term memory and mediation of emotions and memory by the monoaminergic system, comparison of the lipid characteristics of the nervous system in different fish species, structural and functional

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USSR

KHRUSHCHOVA, V. M., IZVESTIYA AKADEMII NAUK. SERIYA BIOLOGICHESKAYA No 4, 1976 pp 631-632

organization of the adrenergic apparatus of blood vessels, analysis of human neuronal impulses during various kinds of mental activity, and progress in the study of the physiology of speech perception and recognition, specialization of the right and left hemispheres and their role in regulating emotions, man's adaptation to weightlessness and an altered gaseous atmosphere, membrane and molecular mechanisms of excitability, mechanisms of transport of substances to and from the cell, and transmission of information, genesis of chemical mediators and their mechanism of action on postsynaptic membranes.

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USSR/POLAND

UDC 612.014.461.2

KURENKOV, GARRI IVANOVICH

BIOMEDICAL ASPECTS OF DIVING

Gdynia BULL. INST. MARIT. AND TROP. MED. GDYNIA (PRL) in Russian 1975, Vol 26, No 2, pp 215-224

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (III) 1976 Abstract No 7R540 by A. V. Sterlikov]

[Text] The paper, read at the 6th International Symposium on Marine Medicine, discussed the proceedings as they related to underwater biomedicine. A total of 18 reports in this field were presented at the symposium. Among the key problems studied in physiology and industrial hygiene were: physiological evaluation of man's fitness, substantiation of work and rest routines, and planning of measures for the prevention of occupational diseases. One of the most useful ways of increasing the efficiency of diving and decreasing the incidence of occupational diseases is to set up a system of safety standards for work under water, including the classification of dangerous and injurious
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USSR/POLAND

KURENKOV, GARRI IVANOVICH, BULL. INST. MARIT. AND TROP. MED GDYNIA (PRL) 1975 Vol 26, No 2 pp 215-224

production factors, with regulation of the maximum permissible parameters of their action, and indication of protective measures. The view was voiced of a need for cooperation among all interested countries in creating such a system of safety standards. USSR, Moscow, Scientific Research Institute of Water Transport Hygiene, Ministry of Health USSR.

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USSR

UDC 612.221

MONOGAROV, V. D. and ANTIKOVA, V. A., Problem Laboratory, Institute of Physical Culture, Kiev

INFLUENCE OF TRAINING LOADS IN VARIOUS DIRECTIONS ON EFFICIENCY OF EXTERNAL RESPIRATION IN HIGH-RANK CYCLISTS

KIEV FIZIOLOGICHNIY ZHURNAL in Ukrainian Vol 21 No 6 1975 signed to press 13 Dec 74 pp 807-812

(Text: English language abstract supplied by authors) Data are presented on changes in minute volume of respiration, alveolar ventilation and their ratios, utilization of oxygen from the alveolar air, and on certain peculiarities of carbonic acid gas removal from the organism under physical load of different intensity in cyclists, depending on direction of the training process. The effect of the training process direction on the efficiency of the external respiration and development of aerobic productivity of an organism is determined. It is shown that a higher efficiency of external respiration observed in the cyclists specializing in pursuing races (track) contributes to reaching both great absolute and relative (per 1 kg of weight, 1 kg of fatless mass, 1 m² of body surface) maximal values of oxygen uptake and carbonic acid gas excretion and to an increase in total efficiency of cyclist trainees. Figures 3; Tables 2; References 7: 5 Russian, 2 Western.

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USSR/POLAND

UDC 612.014.461.2

DOBOSZYNSKI, TADEUSZ and LOKUCIJEWSKI, BOGDAN

PHYSIOPATHOLOGICAL AND HYGIENIC PROBLEMS OF THE UNDERWATER ACTIVITY OF MAN (CO-REPORT ON THE DISCUSSION OF THE PROCEEDINGS OF THE 6TH INTERNATIONAL SYMPOSIUM ON MARINE MEDICINE)

Gdynia, BULL. INST. MARIT. AND TROP. MED. GDYNIA (PRL) in English 1975, Vol 26, No 2 pp 225-238

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (III) 1976 Abstract No 7R541 by A. V. Sterlikov]

[Text] Eighteen papers were presented by scientists from 4 countries at the underwater biomedicine section of the 6th Symposium on Marine Medicine. These papers were discussed in terms of their scientific value and from the standpoint of world scientific achievements and problems in these areas. The authors suggest that the countries represented at the symposium agree to exchange bibliographic materials and information on the organization in their countries of national conferences, consultations, and meetings to discuss the problems of underwater medicine. Bibl. references 32 Poland, Gdynia, Military Medical Academy.

1/1

USSR

UDC 611.13-018:612.014.47)-092

KOSOurov, A. K., Department of Normal Anatomy, First Leningrad Order of Labor's Red Banner Medical Institute imeni Academician I. P. Pavlov

STRUCTURE OF THE WALL OF MAIN ARTERIES UNDER THE EFFECTS OF EXPERIMENTAL HYPERGRAVITATION AND HYPOKINESIS

Leningrad ARKHIV ANATOMII GISTOLOGII I EMBRIOLOGII in Russian Vol 70
No 6 Jun 76 signed to press 24 Feb 76 pp 47-54

(Text: English language abstract supplied by authors) The structure of the wall of the carotid, humeral and femoral arteries and the aorta was studied by histological methods in 260 rabbits under effects of positive longitudinal unendurable stresses, stresses of a training character, and hypokinesia. Under study also was the structure of components of the aorta adventitia microcirculatory bed using the V. V. Kupriyanov technique of impregnation of tissue sections. The reversibility of morphological changes in the wall was studied after effects of the above factors and their different combinations. The experiments have shown the morphological changes in the wall to be of similar type and to consist of hyperelastosis and
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USSR

KOSOurov, A. K., ARKHIV ANATOMII GISTOLOGII I EMBRIOLOGII in Russian Vol 70
No 6, 24 Feb 76 pp 47-54

atrophy of the media under chronic stimuli. In the microcirculatory bed there occurred dilation of postcapillaries and venules and diapedesic hemorrhages suggesting phenomena of stagnation. All the morphological changes were reversible which suggests great adaptive potentialities of the vascular system. Figures 6; References 23 (Russian).

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Public Health

EAST GERMANY

HEINE, H., professor, MD, Second Clinic for Internal Medicine (director: DUTZ, H., professor, MD), and ANDERS, G., professor, MD, head of the Cardiovascular Research Department, Internal Medicine Area (Charite) at Humboldt University, East Berlin; BAUMANN, R., professor, MD, director of the Central Institute for Cardiovascular Regulation Research, Academy of Sciences of the German Democratic Republic, East Berlin; and SCHMIDT, H., Academy of Advanced Medical Education (president: WINTER, K., professor, MD).

RESEARCH STRATEGY AND RESULTS OF THE FIGHT AGAINST CARDIOVASCULAR DISEASES IN THE GERMAN DEMOCRATIC REPUBLIC

East Berlin DAS DEUTSCHE GESUNDHEITSWESEN in German Vol 31 No 7, Feb 76 signed to press 25 Nov 75 pp 319-330

[Abstract] The fight against cardiovascular diseases involves research, procedure development for screening and therapy, preventive measures, and record-keeping. These functions were reviewed. The cardiac infarct program includes activities aimed at preventing, treating, and rehabilitation. Detailed data
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EAST GERMANY

HEINE et al DAS DEUTSCHE GESUNDHEITSWESEN Vol 31 No 7, Feb 76 pp 319-330

are presented about mortality (58.3% of all deaths in East Germany), stationary morbidity (13.1% in 1973), disability (6.9% of all cases in 1974), permanent disability (11,470 in 1974), cardiovascular centers (offering diagnostic, therapy and rehabilitation, as well as research and retraining of former patients), cardiovascular diagnostics (18,546 special diagnoses during 1974 in the various centers), cardiac surgery (3,104 operations in 1974), vascular surgery (3,516 operations in 1974), and cardiovascular clinics (297 clinics, which performed 1,445,279 consultations in 1974). Tables 13; Figures 9; no references.

USSR

UDC 612.825.8:616.1-07

STOLBUN, B. M., and YUR'YEVA, T. I., Moscow Scientific Research Institute of Hygiene imeni F. F. Erisman

THE CONDITION OF THE CARDIOVASCULAR SYSTEM IN PEOPLE ENGAGED IN MENTAL WORK

Kiev VRACHEBNOYE DELO in Russian No 7, Jul 76 pp 123-125

[Abstract] Three types of examination of the cardiovascular function in people engaged in mental work have been singled out: characteristics of background data in conditions of relative rest; comparison of data before and after work; direct observation in the course of occupational activity and performance of psycho-physiological tests. Differentiated methods of evaluation of the cardiovascular activity in various types of mental work are considered among personnel of a computer center, administrative and management personnel and students. The informative character of biotelemetry for examination of electrocardiographic data, dynamics of pulse rate and tone of head arteries under mental and emotional strain, has been established.

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USSR

UDC 616.057:616.127-005.8-02

DUDKO, Ye. M., professor, and PIVEN', I. D., Department of Social Hygiene and Organization of Public Health, Kiev Medical Institute

MYOCARDIAL INFARCTION MORBIDITY AMONG PEOPLE ENGAGED IN PHYSICAL AND MENTAL WORK

Kiev VRACHEBNOYE DELO in Russian No 7, Jul 76 pp 147-151

[Abstract] The effect of age, sex, occupation, environment and general health on the prevalence of myocardial infarction was investigated in Kiev in 1969-1970. Of those suffering from infarction, 64 percent were men and 36 percent were women, however, the significance of sex diminished considerably with age. Infarction was less prevalent in Kiev than in Moscow, but was on a par with other large cities. Infarction was 1-1/2 times as common among white collar employees as among laborers. Male employees suffered from infarction 7 times as often as females. The work of employees engaged in mental activities was most often accompanied by nervous-psychological tension or connected with management positions. The work of those engaged in physical activities was

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USSR

DUDKO, Ye. M. and PIVEN', I. D., VRACHEBNOYE DELO No 7, Jul 76 pp 147-151

often accompanied by significant physical or nervous-psychological tension. Infarction was common among people suffering from cardiovascular diseases who neglected their rest, food and health regimes. Tables 3, references: 12 Russian.

2/2

USSR

SHEVCHENKO, R. M., candidate of medical sciences and MILOV, O. P.

THEORETICAL AND PRACTICAL APPROACH FOR THE DEVELOPMENT OF AUTOMATED MEDICAL INFORMATION SYSTEMS AT HEALTH RESORTS

Kiev VISNYK AKADEMIY NAUK UKRAYNS'KOY RSR in Russian No 6, Jun 76 pp 99-101

[Abstract] In November 1975 a conference was held in Yalta devoted to problems of medical information systems at health resorts. Six important papers were presented on hardware and software required by the systems. Most of the reports were devoted to theoretical problems of information systems based on modern computer technology. The projected medical information systems will be based on the computer center located in Yalta. Planning and development of a chain of health resorts, expanding the existing facilities and locating new suitable sites for resorts are the most important problems which the information systems will be required to solve. The medical information systems will be interconnected and will provide a variety of medical information. In order to proceed with the planning of the information systems, many theoretical tasks must be solved. The conference held in Yalta was devoted primarily to the theoretical aspects of the medical information systems.

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Radiobiology

USSR

UDC 575.24:576.851.48

NESTEROVA, G. F., and TOMILIN, N. V., Institute of Cytology, Academy of Sciences USSR, Leningrad

RADIOSENSITIVE MUTANTS OF ESCHERICHIA COLI WITH IMPAIRED PERMEABILITY OF THE CELL MEMBRANE

Moscow GENETIKA in Russian Vol 12 No 6 1976 signed to press 18 Jun 75
pp 129-134

(Text: English language abstract supplied by authors) Membrane proteins and cell permeability of Escherichia coli B/r and different substrains of B/r containing mutations of loci *uvrB*, *exrA*, *lon* and suppressors of these mutations were studied. Membrane proteins were found to be modified only in E. coli B/r *exrA*. The content of 40 000-70 000 D polypeptides was increased and the content of 80 000-100 000 D polypeptides was decreased. Alteration of membrane proteins in E. coli B/r *exrA* was associated with the impaired permeability of cell membrane. Figure 1; Tables 2; References 15: 2 Russian, 13 Western.
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USSR

UDC 575.24:633.16

TARASENKO, N. D., and KIRIN, YU. M., Institute of Cytology and Genetics, Siberian Department, Academy of Sciences USSR; Institute of Physics of Semiconductors, Siberian Department, Academy of Sciences USSR, Novosibirsk

STUDY OF THE GENETIC AFFECT OF LASER RADIATION

Moscow GENETIKA in Russian Vol 12, No 6 1976 signed to press 7 Aug 75
pp 155-157

(Text: English language abstract supplied by authors) The rate of chlorophyll mutations was studied in M2 of barley variety Viner after laser irradiation with argon rays (0.5-13.0 watt/cm²) for 5 sec and wavelength $\lambda = 4880 \text{ \AA}$ and $\lambda = 5145 \text{ \AA}$. It is found that laser rays are inefficient mutagens. Stimulatory effect of laser irradiation on the energy of seed germination was found at power from 1.5 to 5.0 watt/cm². This is of practical value for those regions where barley seeds have a low germination energy due to unfavorable environmental conditions. References 6 (Russian).
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USSR

UDC 616-006.3.04-085.849.114.091

OL'KHOVSKAYA, I. G., and ALIYEV, B. M., Institute of Experimental and Clinical Oncology, Academy of Medical Sciences USSR, Moscow

MORPHOLOGICAL CHANGES IN SOME SARCOMAS OF SOFT TISSUES UNDER THE INFLUENCE OF NON-UNIFORM IRRADIATION

Moscow VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR in Russian No 6 1976 pp 22-26

(Text: English language abstract supplied by authors) Morphological changes in some sarcomas of soft tissue (liposarcoma, synovial, angiogenous, myogenous, fibrosarcomas) following uneven irradiation through grids were studied. Prior to the treatment the diagnosis of malignant neoplasms was confirmed by morphological studies (puncture or trepanobiopsy). Microscopical examinations of the excised tumors revealed necroses, dystrophic alterations in cells and nuclei, appearance of gigantic cells with deformed nuclei, the so-called "therapeutic forms", proliferation of the connective tissue with lymphoplasmacytic infiltration. The degree of manifestation of these processes depended upon the sensitivity of the tumor to radiation

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OL'KHOVSKAYA, I. G., and ALIYEV, B. M., VESTNIK AKADEMII MEDITSINSKIKH NAUK SSSR No 6 1976 pp 22-26

exposure. The most pronounced effect was noted in mixoid liposarcomas. Fibrosarcomas turned out to be resistant to radiotherapy. The morphological changes had no specific character and were identical to those observed in open-field irradiation or chemotherapy. Figures 2.

2/2

Veterinary Medicine

HUNGARY

CZELLENG, F., and SOLYOM, F., Phylaxia Veterinary Biologicals and Feedstuffs, Ltd., Budapest

VIRUS CONTENT AND EFFECTIVENESS OF FOOT-AND-MOUTH DISEASE VACCINES

Budapest ACTA MICROBIOLOGICA in English Vol 23 No 1 1976 signed to press
10 Mar 75 pp 77-81

(Text: English language summary supplied by authors) (i) The amount of 22 nm particles in 26 batches of cattle tongue epithelium extract used for the preparation of C-type vaccine was determined with an improved 50% hemolytic and point complement fixation test after fluorocarbon precipitation of non-immunizing 7 nm particles. The total amount of 22 nm and 7 nm particles (α GN value) varied considerably from batch to batch, 22 nm components (α GF value) showing a maximum 5-fold difference. (ii) Effectiveness of vaccines with known virus content was tested in adult mice challenged with an adapted virus strain. In commercial C-type vaccines the complement-fixing activity of 22 nm particles and the potency of the vaccine showed a logarithmic regression (mouse index = $1.43 + 2.27 \lg \alpha$ GF).
Figures 2: References 23.

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Publications

USSR

UDC 613.31+628.1

CHERKINSKIY, S. N., Editor

A HANDBOOK ON THE HYGIENE OF WATER SUPPLY

Moscow RUKOVODSTVO PO GIGIYENE VODOSNABZHENIYA in Russian 1975 "Meditsina"
Publ. House

[Translation] Annotation: The present volume is devoted to the problem of the hygiene of water and water supply, and is intended for the use of physicians at sanitary-epidemiological stations. It incorporates the latest results of research in hygiene and sanitation technology, along with the experience of practical work in sanitary guarantee of water supply to populated points.

The chapter on hygiene problems of water supply in connection with prophylaxis of population morbidity serves as an introduction. Presented here are questions touching upon the water requirement of populated places, and, in particular detail, questions of the quality of drinking water. A hygienic evaluation and a method for selection of water-supply sources for populated places are given. Here for the first time are presented scientifically-based
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CHERKINSKIY, S. N., RUKOVODSTVO PO GIGIYENE VODOSNABZHENIYA 1975

methods for determining the boundaries of sanitary protection zone of surface and subsurface water supply sources. Described in the book are: systems of water supply based on surface and underground sources; coagulation, clarification and filtration of water; and methods of flotation. An evaluation of the barrier function of purification installations is given. The special features of water supply to rural populated places are considered individually.

Described in greatest detail are methods of disinfection (chlorination, ultraviolet irradiation, ozonization) in reference to various local conditions, the special features of the mechanism involved, and the factors which influence the effectiveness of bactericidal and virucidal action. Among the special methods of improving the quality of drinking water, the most fully treated in the book are water softening, fluoridation and defluoridation. Presented for the first time is a method of preventive and current sanitary inspection, quality control of drinking water, and special measures (disinfection of water conduit systems, equipment and liquidation of "crossed" compounds, and others).

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USSR

CHERKINSKIY, S. N., RUKOVODSTVO PO GIGIYENE VODOSNABZHENIYA 1975

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USSR

PROBLEMS OF EPIDEMIOLOGY, MICROBIOLOGY AND INFECTIONS PATHOLOGY

Kishinev VOPROSY EPIDEMIOLOGII, MIKROBIOLOGII I INFEKTSIONNOY PATOLOGII, 1974
"Kartya Moldovenyaskie" Publ. House pp 188-191

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GLUSHKOV UPHOLDS NEED FOR DEVELOPMENT OF ARTIFICIAL INTELLECT

Moscow LITERATURNAYA GAZETA in Russian 7 Jul 76 p 12

Interview with academician V. Glushkov by V. Moyev, reviewer of LITERATURNAYA GAZETA: "Artificial Intellect"

Text Materials on this subject were published in Nos 1 and 17 of LITERATURNAYA GAZETA in 1976. Today we continue the discussion.

Academician V. Glushkov and V. Moyev, reviewer of LITERATURNAYA GAZETA, discuss the problem of "Artificial Intellect: Why Is This Being Done?"

From the Vestibule to Mars

Question Shall we continue, Viktor Mikhaylovich? Last time you categorically stated that modern science can create an artificial intellect.
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Let us assume that it can. Indeed, judging from readers' comments, by no means does everyone believe in its success, but let us assume that science can achieve this. Then the question arises: What for? What is the need for this? Right now do you see a vital need for the creation of an artificial intellect?

Answer Of course, there is no need to create it to "replace" people. We do not set such goals. But there are others.

You will surely agree that our world is rapidly becoming more complicated. The human intellect does not manage and biologically cannot progress at such a rate. Geniuses are rare. In no way can we boast that today's engineers, scientists, or anyone else, are all like Leonardo da Vinci. On the average, mental abilities remain the same as 50 and 1,000 years ago. But problems--in science, technology, economy and sociology--are more and more complicated. What is really necessary are amplifiers of mental abilities, of certain brain functions.

Question Precisely which?
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Answer Many. Let us take calculating abilities. No human effort is sufficient for the mass of mathematical operations performed on electronic computers. More effort will be needed in the future.

Question Phenomenal calculators are also encountered among people. Competitions were organized and sometimes people put electronic computers to shame. This means something. Perhaps fantastic abilities lying dormant in every man, which are not recognized by science, come to light here.

Answer These are exaggerated sensations. Human calculators sometimes won only because of delays at the input and output of electronic computers. There can be no question of the actual competition in speed. Any specialist will tell you this.

With regard to the nature of the gift for calculation, apparently, there are two types. Sometimes it is the fruit of stubborn training. For example, it is possible to learn the multiplication table not up to "nine times nine," but up to "99 times 99," or even more. Of course, speed will increase. But
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is it worth loading the human brain with such dry stuff? I was told that American schoolchildren carry miniature electronic computers in their satchels. Some teachers grumble--they cannot part with the cramming of the multiplication table--but I personally believe that this would be good. There are more important and more interesting things for young minds. But this is parenthetical.

In other cases phenomenal human calculators themselves do not know how they get an instantaneous answer. It is given by nature, and that's it. I assume that accidentally arising special connections of brain "cells" are decisive here. A so-called parallel summator, as in a computer, is formed in the brain. You and I multiply and divide numbers successively, by digits, but such a calculator can operate with all the digits simultaneously. Only in living nature this is a very rare chance, while in an electronic computer this is a trivial rule. The principle is known. Were there a possibility of "remounting" one's neurons so that a parallel summator may be formed... But, first, as yet there is no such a possibility, and even if it appeared... Tell me, in your opinion, is it better to interfere in the living brain? For what? Again for routine's sake?

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Question This is convincing. Let us give the routine calculation to the computer. The majority will certainly agree. What else, besides calculation?

Answer Let's go on. More and more often it is necessary to perform operations in which the personal presence of people is undesirable or even impossible; for example, in underwater depths, in the rooms of atomic electric power stations where there is radiation and in outer space. You will recall that the roving lunar vehicle was controlled from the earth by radio. This is not very suitable for Mars. The delay in the passage of signals is $6\frac{1}{2}$ minutes--this is a bit too much. This means that it is necessary to send intellectual robots capable of operating independently and orienting themselves to the situation.

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Let's go back to earth, to "ground" occupations. Have you noticed this paradox? A brilliant fitter, gear cutter, or virtuoso grinder--people of the highest skills--make way for automatic machines with program control without special problems. But try to replace a loader! Even more remarkable: Try to do without an old janitor who sits in a vestibule and "does nothing..." It is very difficult to automate intellectual labor.

Question Intellectual? This is really a paradox. One does not often have occasion to hear this about a janitor or a loader.

Answer This is not the point. In pure form there is no "mental" or "physical" labor. I wanted to stress how conventional the divisions accepted by us are. A janitor must know a person and not confuse him with others. A loader must decide whether a thing can or cannot be tilted and how to grasp and position it--this is true mental labor. Perhaps it is unusual to hear this because fitting or gear cutting skills are taught specialties, but one can work as a janitor without special training.

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And now I would like to ask you: Should we automatize subsidiary and auxiliary jobs, from which people turn away more and more often, because they are boring and uninteresting to them? Should we?

Question There is no question. We are even behind in this. The importance of overall mechanization and automation of such operations was often stressed in party decisions.

Answer If there is no question, this means that there is the most vital need for artificially modeling another brain function--the recognition of images. Without this it is impossible to free a modest doorman, or to organize the operation of automatic machines on Mars. I repeat, this is difficult. More than one-half of the neurons of the living brain in one visual center alone--5 or 6 billion--are directed toward the recognition of images. Nevertheless, cybernetics is making progress. Robots are being used in production more and more often.

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Unity of Near and Remote Goals

Question Can one also talk about the cybernetization of other brain functions?

Answer Yes. I would like to point out those connected with the control of complex systems--economy and social life. We talked a great deal about the cybernetization of these spheres in the first series of our talks. Next, one should mention the capacities for logical thinking which, in my opinion, obviously do not meet our needs. I would like to add that it seems to me that, for example, the development of scientific theories is more and more often confined by the limits of human capabilities. In order just to begin solving ordinary problems, one must spend one-third of one's life on training and on "stuffing" one's brain with the necessary knowledge. And

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how much time is then spent on the solutions themselves? I had a case when, in addition to many years of training, it took me 3 years--3 years day after day, literally without a minute of respite--to prove just one theorem. For example, do you know where a solution first flashed in my head? At the Klukhorskiy pass. I appeared to be resting and wandering, but my mind was working. Scientists struggle with more complex problems for 20 and even 30 years. It can be boldly assumed that among the "damned" unsolved problems there are also such for which our lifespan is simply not sufficient. An onslaught is still needed, but... a funeral announcement, passing on the baton, gathering strength for a new onslaught: the assault stopped.

In specific terms, there is a need to automate deductive thinking, in particular, the processes of proving theorems. Our institute and other places are engaged in this.

Question In brief, our brain is not perfect, it cannot do without amplifiers?

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Answer You speak ironically to no purpose. One can also mention exceptions. I would include emotions in them. Although at times we criticize our century for its "rationalistic nature" and "insensibility," I don't believe that the emotional world is becoming impoverished. There are no apparent reasons for the interference of cybernetics here.

Question However, the modeling of emotions is still pursued, in your institute as well.

Answer More for cognitive than for constructive purposes. In practice, psychiatry is perhaps interested in this. There is hope that, by understanding the mechanism of emotions, we will be able to cure mental diseases. Naturally, this is important, but of concern to few.

Incidentally, here is a curious detail. In spiritual culture emotional life is traditionally surrounded by an aura of special mystery, complexity and enigma. "There is a fatal darkness in feelings..." I must say that the

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first experiments revealed that emotions are modeled much more simply than such things as the recognition of images, or logical thinking...

Question Excuse me, I did not want to speak ironically. As a matter of fact, I prepared another question. Amplifiers of certain brain properties, kinds of "attachments," are, of course, useful. No one disputes this. However, the living brain is not a mechanical sum of "properties"--it is a unique whole. I don't quite understand: Does a set of "attachments" bring us closer to a whole artificial intellect?

Answer The modeling of functions has its logic leading to integration, to an ever greater likening to brain work.

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In fact, at first, owing to technical reasons, we had to design the Turing universal automatic machine differently than the brain is formed. The brain has 14 billion neurons, while the first electronic computers had a few hundred logical elements. What comparison can be made when computers derived the entire "brain" from magnetic tapes and looked for any nonsense in the auxiliary storage? How was the recognition of images modeled at first? We put information on, let us say, every facial feature in the auxiliary storage and the computer compared it with what it saw in front of it. For example, it compared the eyes, nose and mouth successively, not at all as people do. You and I recognize each other with half a glance, almost instantly, because all the 7 to 8 billion neurons participate in recognition together, in parallel, simultaneously. About 16 years ago at the All-Union conference on electronic computers it was stated that in time we will face the problem of "unparalleling" integral circuits for the recognition of images and they will resemble the brain structure. This is what has happened. Hundreds of thousands of artificial "neurons" now operate as one whole in an electronic computer. Tomorrow there will be hundreds of millions of artificial "neurons" and even more.

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The creation of an artificial intellect with due regard for urgent needs seems to me the most justified strategy.

Question Are there others?

Answer There are. For example, two approaches have been clearly noted in the field of modeling logical thinking. Some scientists pin their hopes on the development of a universal proving system which can do without mathematicians. A program, which at first in 1½ and then in 7 minutes proved all the theorems gathered in the classical monograph by Whitehead and Russell, was developed.

Question Did it construct new proofs, or repeat known ones?

Answer As a rule, new proofs. It even proved several dozens of theorems which were not in the collection, so that one can talk about the authorship

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of electronic computers. There are also advocates of this trend in our country. They also make advances. Nevertheless, I personally support another approach, in particular, because I don't see why there is a need to remove mathematicians from mathematics. Such an aim seems to me impractical, even when it is quite successful, and in the meantime?

We have our own approach. We set the goal of helping people, not freeing mathematics from people. Therefore, we place the main emphasis on cooperation and interaction between man and machine, where each side has a wide scope to exercise his best abilities. For me one of the most important principles of the entire program for the development of an artificial intellect and even all scientific activities is connected with this. This

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is a kind of slogan, so to speak, which I formulate as a unity of close and remote goals. If one sets a long-term task, one should be able to construct the movement so as to attain useful results along the road. And vice versa: One should not set close goals, upon the attainment of which one cannot see a continuation. Thus, it seems to me that this is both more practical and more correct.

Once Again About the "Revolt of Robots"

Question Then I have a second charge: "why?" Not in connection with needs, but how to express this? I read that science and technology are also able to change climate. There are finished projects, but no one rushes them. This is understandable, what for? It is difficult to foresee the actual consequences of such unusual projects. Plans can have one thing, and results, quite another. Do you remember Griboyedov's "The Sorrow of Being Wise"? "I was going to one room and found myself in another." The thought comes to mind (please forgive the pun): Let the new artificial intellect not be a source of new sorrow. As far as I recall, even Norbert Wiener, the "father of cybernetics," warned about this.

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Answer What was, was. Once I tried to argue with him, but, alas without special success.

Question Did you meet him? This is interesting...

Answer In the United States, 2 years before his death. I was in the Massachusetts Institute of Technology and we were introduced.

Question Did he hear anything about you?

Answer Absolutely nothing. At that time I did not have any published works on cybernetics.

What did Wiener fear? That the complication of cybernetic systems will damage their reliability. One can hear this often. People say: Some unimportant part will burn, and there will be an avalanche of the most catastrophic consequences. This is a favorite theme of fantasists.

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Question True. This is depicted approximately as follows: "Suddenly something cracked in the electronic belly of the 17B block and a sweetish smell of burned plastic permeated the main console" and--my God!--what has become of Africa?

Answer A parody. But, generally speaking, the question of the consequences of breakdowns and failures in complex systems is a serious problem. Those who fear this express a broad thesis which they almost make into a law of nature. It is implied, I repeat, that the great complexity of a system inevitably leads to a reduction in its reliability. I don't categorically agree with this thought. If you wish, I don't agree with it philosophically.

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Indeed, I had no real argument with Wiener. He was interested in problems of medicine and biology. At the end of his life Wiener was captivated mostly by them. But I am firmly convinced that the idea that complication is sure to lower reliability is clearly erroneous. Of course, we cannot fully rule out the possibilities of breakdowns, but I reject the notion that reduced reliability is a fatal law. If we work with a sense of social responsibility, there will be no fatal consequences because of some disturbances.

Question Is it only a matter of "disturbances" and "breakdowns"? Let us take another thing: The system operates according to your program, but the interweaving of all kinds of interconnections and secondary couplings can lead to such...

Answer The effect of the "monkey's paw"?

Question What?

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Answer The British writer Jacobs has the following story. A dried monkey's paw magically fulfilled wishes. A person wanted to get 200 pounds, and insurance for his son who died in an accident was brought to him.

Question Yes. Such a fulfillment of one's wish would hardly suit a normal person... Finally, such a danger as the "revolt of robots" is also discussed. If the artificial intellect resembles the living intellect in everything, this means that it has the capacity for self-development and who knows where it will be directed? What if it is directed against people? Suddenly your artificial intellect will take up arms against the natural intellect.

Answer Essentially, there is no big difference. Some talk about blind, so to speak, disturbances and others tend to attribute them to the computers' "ill will." I can express my opinion on this. Only a short digression, two words about cybernetics as a whole, will be needed.

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Question Please.

What Is Cybernetics?

Answer Sometimes cybernetics is defined as the science of the most general laws of control. My opinion--I wrote this in articles for the Ukrainian and British encyclopedias--is slightly different. It is the science of the general laws of information conversion in complex systems. You may ask: Is this a big difference? However, a mathematical proof is not control--it is reached according to all the laws of information conversion, according to the laws of cybernetics.

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Subject and method distinguish any independent science. If, for example, the subject of cybernetics is control and communication, what is its specific method? It is not clear. Perhaps because sufficient attention was not paid to this aspect of the matter, after Wiener cybernetics in the United States began to wither and simply degenerate into a search for analogies between biological and technical systems. Meanwhile, it has its own method which makes cybernetics a science with a capital "s." This is a new and remarkable method of knowledge. The essence and soul of cybernetics lie in it, not in the fact that cybernetics deals only with control.

Question However, as we were taught, there are only two "methods of knowledge"--experimental observation and strict logic. That's all. Science is based on these two foundations. Or am I wrong?

Answer Cybernetics offers a third one: modeling. More correctly, this method combines the features of the two main foundations. Essentially, it is experimental. However, experiments are not conducted on a real object, but on its description and on an abstract model. That's the point.

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Let us take--you brought this up--the change of climate. To experiment with nature? This is risky, moreover, when remote consequences occur! To envisage everything "abstractly" in the mind? This is impossible for complex programs. This is a fact. However, why not act differently--record the plan in all its details in a machine language and try it out in a model. In a short time high-speed electronic computers will reveal "what will happen if..." without the slightest interference in real processes. Here is your guarantee against the "monkey's paw," whether it is an accident or a "revolt of robots." Do you understand?

Question Vaguely.

Answer What is the self-development of the artificial intellect? It is primarily automatic planning, where cybernetic systems of a smaller complexity are capable of developing systems of a larger complexity. However, there is a very important "but." At first they will execute the project in a model, not in nature. Let us discuss this realistically. The presently

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existing electronic systems are safe for people, are they not? However, by means of them we can check on models the systems of the next level of complexity--let us assume conventionally--a new category of intelligent robots. We check if everything is in order and then we build this category, and so on. Again we model, check and then build; model, check...

The processes of self-development of machines to which we intend to give life will also be modeled in advance and the models will show the way in which future self-development will be directed. They will show this in advance.

Question A crazy question: Can it happen that one fine day an ordinary model will, in fact, act ominously and aggressively?

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Answer If without mysticism? It is fully conceivable.

Question And what then? Will progress be stopped?

Answer Why all progress? We will stop the dangerous line of development and that's all.

Question How will we stop it, excuse my outburst, how? Look, you are a man and I am a man. Can you "stop" any of my thoughts? Not at all. How will you stop the thoughts of the artificial intellect if--these are your words!--it resembles the real intellect in everything? Therefore, not the thoughts, but acts, of the artificial intellect will be controlled, is that so? Then it is not clear to me in what way, owing to what will the natural intellect retain its "supreme power" over the artificial intellect equal to it? Please explain.

A Bronze Knife-Switch and Guarantees

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[Answer] In principle, I connect the future not only with the development of the artificial intellect, but of a united intellect of complex cybernetic systems which will undertake production control, development of scientific knowledge, space expeditions and so forth and so on. The question arises: What will man do then? At first glance it seems: "What "supreme power," no role will be left to man.

However, this is a deep error. One cannot do "without man" at any level of development of automated systems or the artificial intellect. He alone can stand at the beginning and end of any information process. The assignment for systems can proceed from him alone, he alone is capable of advancing criteria and evaluating results. Here nothing can replace man.

[Question] Why? Is this simply your "credo," or are there proofs?

[Answer] Because otherwise an absolutely impossible thing would have to be modeled...

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[Question] Stop! Does this mean that there are still things that do not lend themselves to modeling? During our first conversation you seemed to state that there are no such things.

[Answer] Now I would like to add--with one exception. A system of machines capable of guessing the development of human views, tastes, desires and evaluations would be needed. In principle, this is ruled out.

Proofs? A theorem, which has something in common with the Heisenberg uncertainty principle, was solved in the theory of automatic machines. In a simplified formulation it states the following: There cannot be two complex systems that subsequently will begin to develop in absolutely the same way. Let us assume that you put all your knowledge and ideas, as though

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"all of you," into a machine. In the meantime, however, you change, your consciousness continues to develop and reshape itself so that the "copy" placed in the machine will never be the same as the "original." A certain moment in your natural development--new knowledge and shades of views not communicated to the artificial intellect--constitutes the difference. This will guarantee people their "supreme power" if only...

Question If what?

Answer No, let us leave it for a little later. Now I would like to say something else. In addition, a complex self-developing system should be equipped with an emergency circuit breaker provided that self-development can affect any part of this system except the emergency circuit breaker. It is "taboo," it must always remain the same as it was when the system was put into operation. Are you smiling?

Question You know, I see the following romantic vision: Unusual halls, domes, streams of light... the future world. Efficient robots, antennas,
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clever automatic equipment operate for all mankind and in a secret niche behind a spider's web there is a bronze knife switch turned green: an emergency circuit breaker...

Answer Fantasize to your heart's content. What is important is that the principles of such a protection of complex systems have now been properly developed. Forget the "bronze" knife switch. The development of protection requires primarily a list, an exhaustive register of everything that is considered an undesirable consequence. Of course, it cannot be prepared at a stretch. There is a need for special investigations, for a kind of "money box" and an open bank of ideas that replenishes itself. Then, if the artificial intellect turns to a problem whose solution is fraught with undesirable consequences, the emergency circuit breaker will immediately stop the operation.

Question O. K. The artificial intellect cannot control the "bronze knife switch." But if a living hand infringes on it?

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Answer How can this be visualized? If we look at the future through the prism of the present time, perhaps only in this way. For example, a threat of a thermonuclear war exists in our present world. Are there forces capable of unleashing it? There are, as long as imperialism, its military and industrial complex and people raving against communism exist. Scientific and technological progress, from which these people received atomic and hydrogen weapons, tomorrow--I don't rule this out--can supplement them with cybernetic weapons. If so, one can abstractly imagine an inhuman attempt to "wreck the knife switch," but realistically, no, I refuse to imagine this. This is in contrast to the philosophy of social optimism which contains realism.

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Examine the present time once again. It is a fact that during its development civilization created not only destructive weapons capable of sweeping it off the face of the earth. With necessary anticipation history also put in the arena forces capable of preventing such a catastrophe. History led to socialism, whose world influence continues to grow. This is the most important social guarantee in addition to the guarantees of reliability, safety and obedience of the future cybernetic systems we are discussing.

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Physiological Psychology

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UDC 612.014.482.5+613.693

TOMARCHENKO, I. S.

PSYCHOPHYSIOLOGICAL STUDIES ON PILOT PERFORMANCE

Tselinograd INDIVIDUAL'N. RAZLICHIIYA PSIKHOFIZIOL. I PATOL. DEYAT-STI
[Individual Differences in Psychophysiological and Pathological Activity,
Collection of Works] in Russian Pt 3, 1976 pp 43-44

[From REFERATIVNYY ZHURNAL, BIOLOGIYA No 7 (III) 1976 Abstract No 7R517 by
L. G. Orlova]

[Text] The effects on pilots of an 8- to 10-hour nonstop flight through 7
time zones were determined from the condition of the visual analyzer,
accuracy in fulfillment of arithmetic problems, occupational performance,
blood pressure, and pulse rate; the pilots' subjective sensations were also
taken into account. Data were obtained before takeoff and every 2 hours
thereafter during the trips which were completed at night in an easterly
direction and in the day in a westerly direction. Distinct functional dis-
turbances were noted in relation to the duration of transmeridian flights.
The adverse health effects were somewhat more pronounced in some segments of
the night flights. Of interest is the fact that the actual piloting work
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TOMARCHENKO, I. S., INDIVIDUAL'N. RAZLICHIIYA PSIKHOFIZIOL. I PATOL. DEYAT-STI
Pt 3, 1976 pp 43-44

(takeoff, landing, reading the instruments) was well done, despite the low
functional activity of the body.

Psychiatry

EAST GERMANY

STARKE, Hellmut, MD, graduate psychologist, Karl Marx University, Area: Medicine, Department of Psychotherapy and Neurosis Research (Head: WEISE, K., professor, Dr. of Medical Sciences), Leipzig

AUTOGENOUS TRAINING IN THE FRAMEWORK OF THE THERAPY OF SCHIZOPHRENIC PATIENTS

Leipzig PSYCHIATRIE, NEUROLOGIE UND MEDIZINISCHE PSYCHOLOGIE in German Vol 28, No 6, Jun 76 pp 343-351

[Abstract] The literature dealing with autogenous training in general and its therapeutical applications in particular was reviewed. There seems to be some reluctance toward using psychotherapeutical methods in general, and autogenous training in particular, in the therapy of schizophrenic patients. Part of the reason may be that attempts so far have been unsuccessful. But there are creditable reports that autogenous training may be successful if properly employed. Systematic studies should be carried out to establish the proper procedures. Some encouragement may be obtained from the author's trials which were successful. They are briefly described. References 26: 18 German and 8 Western.

1/1

HUNGARY

OZSVATH, Karoly, Dr, medical lieutenant-colonel, candidate of medical sciences

PATHOLOGICAL PERSONALITY STRUCTURE WITH PROBLEMS IN ADAPTATION TO THE COMMUNITY (AN EXPERIMENT FOR THE SOCIO-GENETIC INTERPRETATION OF PSYCHOPATHOLOGICAL PERSONALITY DEVELOPMENT)

Budapest HONVEDORVOS in Hungarian Vol 28 No 1, Jan-Mar 76 pp 3-10

[Abstract] Military physicians encounter pathological personality structures and experience difficulties with military discipline, moral and performance. The author reviews the medical and psychological aspects of the pathological personality structure in terms of its adverse effects on adaptability to the community and of the causes for its development. The pathological personality structure is not a disease but a manifestation of the primary and secondary socializing inadequacy. Conventional methods of therapy will not work; the correction of the defect must be attempted by personalized social means. Preventive methods are the most promising; the family, school, workplace, and other such agencies may help much here. The military usefulness of individuals with pathological personality

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HUNGARY

OZSVATH, Karoly, HONVEDORVOS Vol 28, No 1, Jan-Mar 76 pp 3-10

is quite limited and restricted, especially in view of the currently employed military training methods. Testing of fitness on this basis is not yet an exact science. The adaptation difficulties cannot be regarded merely in terms of fitness problems; the nature, intensity, and possible modification of the problem depends not only on the individual but also on the immediate military surrounding. References 23: 5 German, 13 Hungarian and 5 Western.

2/2

USSR

UDC 616.89-084

GONOPOL'SKIY, M. KH., professor, chief of the Department of Psychiatry, Alma-Ata Institute for the Advanced Training of Physicians

NEW PRINCIPLES AND ORGANIZATIONAL FORMS OF DRUG ABUSE (NARCOLOGIC) SERVICES

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 7, 1976 pp 45-48

[Abstract] The increase in drug abuse and alcoholism has led to the proposal that a special narcologic service be created to combat such social shortcomings, provide preventive measures, and assure rehabilitation. In this respect the various public health services have been greatly aided by the Ministry of Internal Affairs (MVD) with its outstanding facilities and expertise. In recent years, particularly from 1971 to 1976, an increase in alcoholism and other forms of drug abuse has been reported; however, it appears that this may have merely reflected more effective surveillance methods. In order to assure effective cooperation between the various governmental bodies that are concerned with this problem it is proposed that the narcologic service encompass the following 5 units: 1) the Ministry of Health;

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GONOPOL'SKIY, M. KH, ZDRAVOOKHRANENIYE KAZAKHSTANA No 7, 1976 pp 45-48

2) the MVD and its judicial extensions; 3) special commissions at various industrial, agricultural, educational and other enterprises created to deal with this problem; 4) organizations designed to provide mass anti-drug abuse propaganda and education, including the Znaniye (Knowledge) Society; 5) anti-drug abuse commissions at Workers' Soviets.

2/2

USSR

UDC 616.89-085

ZAL'TSMAN, G. I., Chief, Department of Psychiatry, Alma-Ata Medical Institute

CERTAIN TYPICAL MISTAKES IN PSYCHOPHARMACOLOGIC THERAPY

Alma-Ata ZDRAVOOKHRANENIYE KAZAKHSTANA in Russian No 7, 1976 pp 43-45

[Abstract] A survey of many psychiatric hospitals in Kazakhstan has shown that, most commonly, improper therapeutic use of psychotropic drugs is due to inertia of physicians in appreciating a changing mental state in a patient or in becoming accustomed to newer, more effective preparations. On the other extreme are psychiatrists with a tendency to discard time-tested drugs for newer preparations with limited clinical usage or a preference for imported drugs in the presence of equally effective Soviet preparations. Another factor of importance is the tendency to almost exclusively rely on chemotherapy and neglect such other powerful adjuncts as shock therapy, psychotherapy, sociotherapy, occupational therapy and so forth. Obviously, misuse of drugs in the treatment of mentally disturbed individuals reflects negatively on the professional qualifications of the physicians.

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Publications

USSR

UDC 612.8.015+612.017.1+575.1

ASHMARIN, I. P.

PUZZLES AND REVELATIONS IN THE BIOCHEMISTRY OF MEMORY

Leningrad ZAGADKI I OTKROVENIYA BIOKHIMII PAMYATI in Russian, Leningrad University Publ. House 1975

[Translation] Annotation: The author takes up the various forms of biological memory, their interconnections and evolution. This examination of the biochemical mechanisms of biological memory, in its given form, is without precedent in the scientific literature. Usually the biochemical mechanisms of genetic, epigenetic, immunological and neurological memory are examined only in a limited number of combinations or individually. Yet it is very important to perceive what is common to the various forms of biologic memory, and to understand their interrelationship and hierarchy.

The book is of interest to a broad circle of biologist-biochemists, physiologists, immunologists, oncologists and microbiologists, as well as all those who are interested in the problem of memory for its own sake. Illustrations: 24; Tables: 6; Bibliography: 313 items.

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BREYTBART, A. YA. (Editor) LITVAK, I. I., LOMOV, B. F., and SOLOVEYCHIK, I. YE.

PRINCIPLES FOR THE CONSTRUCTION OF APPARATUS FOR REPRESENTING INFORMATION IN AUTOMATED SYSTEMS (BOOK)

Moscow OSNOVY POSTROYENIYA APPARATURY OTOBRAZHENIYA V AVTOMATIZIROVANNYKH SISTEMAKH in Russian Moscow "Sovetskoye Radio" Publ. House 1975 pp 3-350

[Translation] Annotation: The present volume concerns the basic lines of development in modern systems of information representation (SII). Results given in the latest research in industrial psychology have to be taken into account in selecting the operational regimes and parameters of SII. Special features of the construction of means of representation for both individual and collective use, and also variants of the technical realization of these means, including devices for three-dimensional representation, as well as SII based on the use of new physical principles, are all considered here.

The book is intended for the use of engineers and scientific workers concerned with the creation of automated control systems; also for specialists in

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BREYTBART, A. YA, LITVAK, I. I., LOMOV, B. F. and SOLOVEYCHIK, I. YE,
OSNOVY POSTROYENIYA APPARATURY OTOBRAZHENIYA V AVTOMATIZIROVANNYKH
SISTEMAKH 1975, pp 3-350

industrial psychology, and for students of technical colleges and universities who are studying courses in "Radiotechnical Systems", "Automated Control Systems", "Indicator Technology", and the like. The book may also be of interest for a wide circle of readers familiar with the principles of electronics, computer and television technology. Tables: 45; Figures: 279; Bibliography: 367 items.

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All-Union Institute for Study of Causes and Development of Preventive
Measures for Crime

PROBLEMS IN CRIME CONTROL

Moscow VOPROSY BOR'BY S PRESTUPNOST'YU in Russian 1975 "Yuridicheskaya
Literatura" Publ House

[Translation] Annotation: The present collection contains articles devoted
to pressing problems of Soviet criminology, criminal law and trials, and also
forensic psychology. The section entitled "Abroad" gives some information of
general interest.

The book is intended for the use of magistrates, procurators, investigators,
lawyers, and employees of the MVD, as well as law school teachers and
students.

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UDC 62-50

IVAKHNENKO, A. G. (General Editor) corresponding member, Academy of
Sciences Ukr SSR

THE PERCEPTRON, A SYSTEM FOR THE RECOGNITION OF IMAGES

Kiev PERTSEPTRON-SISTEMA RASPOZNAVANIYA OBRAZOV in Russian "Naukova Dumka" 1975

[Translation] Annotation: Discussed in this book are questions of the theory,
modeling, and possible improvements and use of perceptrons.

The perceptron, as a model of perception by the brain, and as a technological recognition system, is becoming increasingly the subject of lively discussion among scientists and engineers. In the present volume the perceptron is regarded merely as a broad, general concept, on the basis of which quite effective recognition and prognostic systems may be created. The rigid three-order structure and the linear character of the perceptron, are rejected by the author. It is shown how a more flexible approach to the perceptron makes possible a realization of all its effective properties, associated with the fact that the perceptron is the first multiorder system realizing the "principle of inconclusive decisions", or the principle of self-organization.

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IVAKHNENKO, A. G., PERTSEPTRON-SISTEMA RASPOZNAVANIYA OBRAZOV 1975

The book is intended for the use of scientists, engineers and technicians working in the area of industrial cybernetics, and also for teachers, aspirants, and senior students of higher schools concerned with the specialties in question.

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