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19 July 1984

# USSR Report

LIFE SCIENCES

BIOMEDICAL AND BEHAVIORAL SCIENCES

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# USSR REPORT

## LIFE SCIENCES

### BIOMEDICAL AND BEHAVIORAL SCIENCES

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ESTABLISHMENT OF POSTURE AND WORKING MOVEMENTS OF PILOT IN AIR CRASH ENQUIRIES

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 3, Jul-Sep 83  
(manuscript received 9 Nov 82) pp 11-12

KLYUYEV, A. V. and ARTEMOV, V. N., Aviation Medicine Branch (chief, B. I. Parmenov-Trifilov, candidate of medical sciences) Scientific Research Institute of Civil Aviation, Moscow

[Abstract] Experts' opinion concerning the whereabouts, condition and actions of air crew members at the time of a crash provide valuable information during an air accident inquiry. An example of how such information is gained is given. The second pilot's position in the plane's cabin and his actions at the time of a crash are determined by analysis of flight parameters at the moment of crash, location of the cabin after the crash, speed of the plane at impact and injuries found on the body of the pilot. Experimental modelling of injuries to crew members inside of a plane of the same type as the one involved in the crash also provide important information concerning a crash.  
[450-2791]



## AGROTECHNOLOGY

### UZBEK PLANT PROTECTION PROGRAM DESCRIBED

Tashkent PRAVDA VOSTOKA in Russian 24 Dec 83 p 3

[Article by Candidate of Chemical Sciences N. Aliyev, senior scientific associate, Uzbek SSR Academy of Sciences Institute of Chemistry of Vegetable Substances: "To Protect Plants. Science to Production"]

[Text] High and steady crop yields cannot be achieved unless plants are protected. Agrotechnical, biological and chemical methods must be combined properly, selecting the most economical combinations.

In the decisions of the May and November 1982 CPSU Central Committee plenums, the USSR Academy of Sciences, the union republic academies of sciences, the All-Union Academy of Agricultural Sciences, and a number of ministries were directed to develop more effective means of protecting plants against pests and diseases, also to work out a technology of new pesticides in order to achieve independence from the capitalist countries in the field of producing these compounds. We must be fully reliant on Soviet compounds. Naturally, this vital effort to develop them has been spearheaded by the USSR Academy of Sciences.

Uzbekistan's chemists have developed a number of new compounds that are widely used in agriculture. Until recently the Uzbek SSR Academy of Sciences Institute of Chemistry of Vegetable Substances was practically the only institution within the USSR Academy of Sciences system engaged in looking for new compounds capable of protecting plants and accelerating growth. We have developed butilkaptaks, uzgen, olgin, toluin, rozalin, and several other plant growth stimulants, the production of which has been or is being started in the country's chemical plants.

In 1982, the defoliant butilkaptaks was used to treat more than 20,000 hectares of cotton. The economic effect came to 4 million rubles. The youngest institute in the Uzbek SSR Academy of Sciences--the Institute of Polymer Chemistry and Physics--has developed A-1, an effective cotton growth stimulant, which is now in widespread use. This broadly acting compound is being used in Uzbekistan, Turkmenistan, Azerbaijan, and Tajikistan. The compound boosts yields by an average of 3 quintals per hectare.

The olgin production facility at the Fergana Nitrogen Fertilizer Plant is used to produce experimental batches of the A-1 compound. Such installations can be operated on shared circuits, and more of them should be built.

New pesticides are also being developed by the bioorganic chemistry and the experimental plant biology institutes of the Academy of Sciences, by the motor highway, medical, irrigation, and agricultural mechanization institutes in Tashkent, and by the state university. The university has developed and tested a full-spectrum herbicide recommended for use along roadsides and ditches. New compounds are being tested by many scientific institutions of the USSR and the Uzbek SSR ministries of agriculture, SAO, of the All-Union Academy of Agricultural Sciences. [SAO: probably Central Asia Department].

Under this arrangement, naturally, duplication of efforts is not ruled out. For successful resolution of the problems, therefore, more effective and precise coordination of the work is necessary. It would be worthwhile to combine all subunits in the republic or Central Asia in order to conduct the work in an integrated manner according to a unified plan. The republic has the cadres to do it.

6854

CSO: 1840/1021

UDC 632.938.1

RESISTANCE OF WINTER WHEAT VARIETIES TO SEPTORIA UNDER LISSR CONDITIONS

Vilnius TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA B. in Russian No 4(84), 1983 (abstract of document filed 5 Jan 82 at LINIINYI--Lithuanian Scientific Research Institute of Scientific-Technical Information and Technical-Economic Studies) p 116

MARKYAVICHYUS, V. Yu., Institute of Botany, LiSSR Academy of Sciences, Vilnius

[Abstract] Three species of mold of the genus Septoria were found to be parasitic on winter wheat in the LiSSR in 1976 to 1981. *S. nodorum* Berk seriously damaged the leaf surface and spike pod of the wheat, *S. tritici* Rob. et Desm. damaged the leaf surface, while *S. briosiana* Mer was rare and presented no particular danger. In measuring resistance of 162 varieties of winter wheat to Septoria substantial variability between varieties and between years was noted. The years 1980-1981 were particularly favorable for Septoria.

UDC 582.28:683.18:631.46(571.63)

FUNGAL SPECIES IN RICE FIELD SOILS OF MARITIME PROVINCE

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 17, No 2, 1982 (manuscript received 2 Feb 82) pp 97-102

YEGOROVA, L. N. and OKSENYUK, G. I., Institute of Soil Biology, Far Eastern Scientific Center, USSR Academy of Sciences, Vladivostok

[Abstract] Field trials were conducted in the period 1980-1981 to identify the predominant fungal species in the rice fields of the Maritime Province, where rice has been cultivated for some 50 years. The results are summarized in tabular form and show the relatively high frequency with which *Paecilomyces*, *Chrysosporium* and *Pseudoeurotium* genera were isolated. Seasonal flooding significantly diminishes the number of species and counts, but the basic genera remain relatively stable. In addition to the saprophytic forms, the rice fields regularly yielded the following pathogens: *Phoma oryzae*, *Pyricularia grisea*, *Fusarium moniliforme*, *Diplodiella oryzae* and *Rhizoctonia solani*. References 29: 1 Ukrainian, 8 Russian 20 Western. [431-12172]

## SUSCEPTIBILITY OF HARD SPRING WHEAT TO FUNGAL DISEASES

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 17, No 2, 1983  
(manuscript received 12 Aug 82) pp 157-160

CHUMAKOV, A. Ye. and SHCHEKOCHIKHINA, R. I., All-Union Institute of Plant Protection, Leningrad

[Abstract] Comparative studies on the infectivity and susceptibility of hard and soft spring wheat to fungal diseases are reviewed. In general, the consensus appears to be that the hard varieties are less susceptible to obligate biotrophs but more susceptible to polysaprophytic fungi. Even small-scale infections of the hard varieties have as serious and severe consequences as do much more widespread infections of the soft wheat varieties. In addition, the hard varieties are also highly susceptible to less than optimal conditions of cultivation and under such conditions show a considerable decrease in crop yield, particularly if this occurs in combination with fungal infections. Concurrently, however, the hard varieties are much more responsive to improvements in agricultural practice with a concomitant increase in resistance to disease. As a result, use of fungicides has a much more profound effect in raising harvest yields in the case of the hard varieties. References 12 (Russian).  
[431-12172]

## MORPHOLOGIC-CULTURAL VARIABILITY OF FUSARIUM WILT PATHOGENS ON COTTON AND VEGETABLE CROPS

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 17, No 5, Sep-Oct 83  
(manuscript received 24 Dec 82) pp 392-395

AKMURADOV, B. and SIDOROVA, S. F., All-union Institute of Plant Protection, Leningrad

[Abstract] In an attempt to determine variability of pathogens, comparative morphologic-cultural study of 4 pathogens of Fusarium wilt was carried out. These pathogens were isolated from infected cotton, pumpkin, cucumber and tomato plants. Fungus strains were grown on standard medium in Petri dishes for 15 days at 24-26°C. All exhibited extensive formations of microconidia. The isolates did not differ by the rate of growth from the growth of mycelium. Overall, the morphologic-cultural indices, even cumulatively, could not be used as criteria for diagnosis of specialized forms of *F. oxysporum* because intraspecies variability was about of the same order of magnitude as the interspecies variability. References 13: 12 Russian, 1 Western.  
[487-7813]

METHODS FOR MAINTAINING PURE PATHOGEN CULTURE OF RICE PIRICULARIOSIS

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 17, No 5, Sep-Oct 83  
(manuscript received 17 Jan 83) pp 425-427

DYAKUNCHAK, S. A. and KHARCHENKO, Ye. S., All-Union Scientific Research Institute of Rice, Krasnodar

[Abstract] Piriculariosis is the most widely disseminated serious disease of rice. The most effective preventive measure is the introduction of immune brands of rice. To evaluate the material selected for high immunity, it is necessary to preserve the viability and pathogenicity of the infectious material. Several methods were evaluated: preservation of the fungus in sterile distilled water, culture maintenance on junction points, fungus preservation on grain. It was shown that fungus viability depended on its method of preservation. The most simple but effective method was the distilled water preservation.

References 3 (Western).

[487-7813]

UDC 636.084

NUTRITIONAL BIOCHEMISTRY AND INCREASED LIVESTOCK PRODUCTIVITY

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 2, Feb 84  
(manuscript received 2 Jun 83) pp 3-9

VAL'DMAN, A. R., Institute of Biology, Latvian SSR Academy of Sciences, Salaspils

[Abstract] A survey is presented of the current state of knowledge and research on the biochemistry of nutrition of livestock, and the latter's value as protein source for the Soviet population. Currently, the deficiency in protein production amounts to about 10 g per feed unit consumed by the animals. The review shows that better nutritional balance of the domestic animals, i.e., use of supplements with appropriate fat-soluble vitamins and trace elements (especially Zn and Se), markedly improves production of high-quality meat. Other problems covered are the inclusion of essential amino acids in feed, the effects of antibiotics and other exogenous chemicals, and the importance of hormonal regulation of metabolism. References 27: 20 Russian, 7 Western.

[491-12172]

# COST EFFECTIVENESS OF CHEMICAL BARLEY STEM RUST CONTROL

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 2, Feb 84  
(manuscript received 20 Oct 82) pp 114-115

STEPANOV, K. M. (deceased), NAZAROVA, L. N., STRIZHEKOZIN, Yu. A., SANIN, S. S.,  
FOCHENKOVA, T. V. and AGAYEV, A. A., All-Union Scientific Research Institute  
of Phytopathology, Bolshyye Vyazemy, Moscow Oblast

[Abstract] Normograms were constructed to determine the cost effectiveness of  
airplane spraying of fungicides on rye fields in terms of the resultant  
harvest as a result of stem-rust control. Studies conducted in the Moscow  
Oblast have shown that two or three sprayings result in a gain of 4-8 centners/  
hectare. On the basis of an anticipated stem-rust problem, the nomograms can  
be used to predict the number of cost-effective sprayings that will be required  
for a satisfactory harvest. Figures 1; references 5 (Russian).  
[491-12172]

UDC 633.11:631.559

# PRODUCTIVITY OF SEMIDWARF WINTER WHEAT VARIETIES

Moscow DOKLADY VSESOYUZHNOY ORDENA LENINA I ORDENA TRUDOVOGO KRASNOGO ZNAMENI  
AKADEMII SEL'SKOKHOZYAYSTVENNYKH NAUK IMENI V. I. LENINA in Russian No 2, 1984  
(manuscript received 19 Sep 83) pp 6-8

SECHNYAK, L. K., corresponding member, All-Union Academy of Agricultural  
Sciences imeni Lenin, GARMASHOV, V. N., SELIVANOV, A. N. and KALUS, Yu. A.,  
All-Union Order of Lenin and Order of the Red Banner of Labor Breeding and  
Genetics Institute

[Abstract] Comparative studies were conducted in 1979, 1981 and 1982 on the  
productivity of winter wheats Odessa Semidwarf and Odessa-51 cultivated on  
clayey loam chernozem, employing different precursor and fertilizers. The  
resultant data summarized in tabular form showed that the Odessa Semidwarf  
variety is comparable to Odessa-51 in terms of dry substance production and  
raw protein yield on a per hectare basis if provided with more mineral  
fertilizers (primarily nitrogen, at least 80 kg/hectare). Equivalence between  
Odessa Semidwarf, on the one hand, and field corn and peas, on the other,  
in terms of silage production was obtained when the former was provided with  
mineral fertilizers supplying 80-120 kg/hectare nitrogen in conjunction with  
P<sub>60</sub>K<sub>60</sub>. References 4 (Russian).  
[1017-12172]

## INFORMATIONAL VALUE OF WINTER RYE GRAIN QUALITY INDICATORS IN RELATION TO BREEDING

Moscow DOKLADY VSESOYUZHNOY ORDENA LENINA I ORDENA TRUDOVOGO KRASNOGO ZNAMENI AKADEMII SEL'SKOKHOZYAYSTVENNYKH NAUK IMENI V. I. LENINA in Russian No 2, 1984 (manuscript received 19 Aug 83) pp 9-11

BEYAKIN, V. M., MARTYNOV, S. P., PISKUNOVA, G. V. and BAMBYSHEV, U. S.,  
Order of the Red Banner of Labor Scientific Research Institute of Agriculture  
of the Southeast

[Abstract] Factor analysis was conducted on winter rye grain to determine those characteristics suitable for use in selecting breeding varieties. Evaluation of 15 characteristics revealed that six of the indicators provided 75-80% of the information that is required for breeding decisions, namely vitriousness, drop rate, weight of 1000 grains, protein content and weight of one liter of grain. In addition to the direct grain characteristics, baking quality was also found to provide valuable information for breeding purposes. References 10: 6 Russian, 4 Western.  
[1017-12172]

## INHERITANCE OF USTILAGO TRITICI (PERS.) JENS. VIRULENCE FOR SPRING WHEAT

Moscow DOKLADY VSESOYUZHNOY ORDENA LENINA I ORDENA TRUDOVOGO KRASNOGO ZNAMENI AKADEMII SEL'SKOKHOZYAYSTVENNYKH NAUK IMENI V. I. LENINA in Russian No 2, 1984 (manuscript received 5 Jul 83) pp 11-13

TIKHOMIROV, V. T., Krasnoyarsk Scientific Research Institute of Agriculture

[Abstract] The inheritance of virulence in Ustilago tritici was studied on six varieties of soft winter wheat differing in susceptibility to this pathogen. The test plants were infected with pure smut isolated and mixed isolates to compare the effects obtained with pure and hybrid mycelia. The results showed that in Ustilago tritici, virulence is a recessive trait. Consequently, the creation of large pools of the pathogen for testing spring wheat varieties to be used in breeding for smut resistance should rely on pure Ustilago tritici strains to give a true representation of immunity. Using mixed infections for this purpose would result in hybrid mycelia with transgressive inheritance (superdominance) of avirulence and, hence, result in erroneous evaluation of resistance to smut. References 10: 5 Russian, 5 Western.  
[1017-12172]

## USE OF PHEROMONES IN LEAF ROLLER CONTROL

Moscow ZASCHITA RASTENIY in Russian No 5, May 83 p 23

YEMEL'YANENKO, L. V., aspirant (post-graduate student), Crimean Agricultural Institute

[Abstract] Tests of more than 30 pheromone preparations, carried out in apple orchards in the Steppe Crimea in 1981-1982, showed the effectiveness of use of these preparations against various species of leaf rollers. Data obtained can also be used to determine the dynamics of flight of leaf rollers. The studies showed that the pheromones could be used effectively to determine the species composition of leaf rollers and to establish their numbers. A few of the preparations also attracted some moths and crickets and some useful insects, which requires their modification. Figures 2.  
[481-2791]

UDC 632.981.1:633.63

## JUSTIFICATION OF USE OF PESTICIDES ON SUGAR BEET

Moscow ZASHCHITA RATENIY in Russian No 5, May 83 p 24

RUSINOV, P. S., senior scientific associate, Voronezh Agriucultural Institute Experimental Station

[Abstract] Long-range (several years) field and production experiments, involving use of metaphos (as a standard) and dilor, bazudin, volation and phthalophos to control sugar beet beetles, showed the effectiveness of these pesticides in controlling the pests under conditions existing in the Central-Chernozem zone. The pesticides did not harm useful sugar beet entomofauna and had little effect on fertility of the chernozem soil. Sugar beet beetles inflict considerable damage in the Central-Cherozem zone each year while other sugar beet pests are prevalent only in some years.  
[481-2791]

UDC 53.035:582.288.43

## EFFECT OF LIGHT ON GROWTH OF PIRICULARIA ORYZAE CAV. STRAINS DIFFERING IN PIGMENTATION

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 17, No 4, Jul-Aug 83  
(manuscript received 30 Jun 82) pp 305-310

AVER'YANOV, A. A.

[Abstract] Attempts to determine if sensitivity to light is increased in piricularia mutants with disturbed pigmentation and if the degree of increase



is great enough to explain the avirulence of these mutants involved a study of *P. oryzae* strains: wild type H-5-3 with grey mycelium and mutants obtained from it--white (*alb 1*) without pigment and rose (*ros 1*) with incomplete pigment. The effect of light on several stages of development of the fungus was studied in vitro. Visible light suppressed development of piricularia at all stages of development studied. The effect of natural light is several fold greater than that used in the experiments so photoinjury is greater in nature. The relative sensitivity to light of the strains studied depends on the stage of development of the fungus. The sensitivity of the unpigmented mutant, as a rule, is higher than that of the wild type while the *ros 1* mutant occupies an intermediate position, approximating the H-5-3 type in some respects and *alb 1* in others. Light sensitivity is not the cause, or, at least, not the only cause of avirulence of the mutants studied. It is possible that various plant-host components can increase or decrease the light sensitivity of the parasite without affecting its pigmentation. One of the possible mechanisms of immunity may be formation by the host of substances which do not injure the parasite directly but increase its sensitivity to injury by light or display toxicity only in light. In this case, it is possible that avirulence of mutants is associated precisely with their increased sensitivity to these or those protective reactions of the plant-host. Figures 3; references 12: 7 Russian, 5 Western.  
[485-2791]

UDC 632.4:633.11:582.285.2

#### NUTRIENT VALUE OF VARIOUS ORGANIC NITROGEN SOURCES FOR CAUSATIVE AGENT OF WHEAT STEM RUST IN VITRO

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 17, No 4, Jul-Aug 83  
(manuscript received 3 Aug 81) pp 317-322

SHASHKOVA, L. S. and MAZIN, V. V., Main Botanical Garden, USSR Academy of Sciences, Moscow

[Abstract] Study of the nature and duration of growth of *P. graminis* f. sp. *tritici* on nutrient media containing one of 12 commercial preparations used by microbiologists as a source of N in nutrient media showed that each of the preparations had a different effect on the nature and duration of growth of the causative agent of wheat stem rust. Substances which determine the nutrient value of any of the peptones studied were not found. One peptone (Vitte) which contains practically no free amino acids (in contrast to the others) produces the weakest vegetative growth of rust fungus and this indicates that the nutrient value of nitrogen sources used in this study is determined by non-proteins or polypeptides. The study indicates that the fungus uses free amino acids or other closely related low molecular compounds as nutrients. This assumption is confirmed by the fact that the causative agent grew successfully on a medium containing a mixture of amino acids from baker's yeast as a source of nitrogen. Figures 2; references 13: 5 Russian, 8 Western.  
[485-2791]

PHYSIOLOGICAL RACES OF PUCCINIA HORDEI OTTH OCCURRING IN THE SOUTH OF THE EUROPEAN USSR

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 17, No 4, Jul-Aug 83  
(manuscript received 30 Dec 82) pp 340-343

OGERCHUK, G. P., All-Union Institute of Plant Protection, Leningrad

[Abstract] Study of the clonal composition of the Dagestan, Rostov and Odessa populations of Puccinia hordei Otth was carried out in 1980-1982. Uredospores of the fungus, collected from zoned and prospective varieties of barley were used as infectious material and the race to which the monoisolates of the fungus belong was determined on the basis of reaction of an international set of variety-differentiators. Races 8, 13, 14, 16, 20, 23, 29, 30 1L and 2L were found to be present constantly in the areas studied. Races 9, 11, 37, 38, 40, 42, 43, 44, 46, 51, x and y were not found in the populations studied. Races 3, 18, 21, 22, 27, listed in the international register, and races 1a, 2a, 3a, 4a, 5a, 6a, 7a, 8a, 9a, 10a were found for the first time. References 7: 5 Russian, 2 Western.  
[485-2791]

WHEAT AND OAT RUST IN ETHIOPIA. 2 COMMUNICATION. GENOTYPIC COMPOSITION OF OAT CROWN AND STEM RUSTS

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 17, No 6, Nov-Dec 83  
(manuscript received 28 May 82) pp 504-508

DMITRIYEV, A. P. and DAYYESA TEREFE, All-Union Institute of Plant Protection, Leningrad

[Abstract] Geotypic composition of oat rust has been studied adequately in many countries, except for Africa. Evaluation of this problem in Ethiopia seemed to be important from the point of view of the world spread of this parasite and because of ever-increasing planting of this grain. Four brands of oats were studied in the area of Ambo: American, Canadian, Hungarian and a local brand. It was discovered that oat genes resistant to stem rust were not effective in Ethiopia. The crown rust population was much more virulent and heterogenic in Ethiopia than in other countries. The increased virulence and lowered heterogeneity of the rust during vegetation of oat indicate dynamic processes existing in the population of the fungus, where a competition among parasite clones exists in which even the susceptible genotypes participated actively. References 15: 6 Russian, 9 Western.  
[486-7813]

CHARACTERISTICS OF GENETIC POPULATION STRUCTURE OF STEM AND CROWN RUST  
PATHOGENS IN SOVIET UNION DURING 1975-1981

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 17, No 6, Nov-Dec 83  
(manuscript received 11 Sep 82) pp 511-516

SUZDAL'SKAYA, M. V., PUGACHEVA, G. T. and ZHEMCHUZHINA, A. I.

[Abstract] Stem and crown rust of oats is found in all regions of the USSR where this culture is planted. Changes in pathogen population need to be investigated for practical selection of resistant varieties. Experimental results were reported of field studied during the past 6-7 years. All types of rust were differentiated by the generally accepted international methodology. The use of monogenic brands and lines of oats with known resistance genes towards pathogens of stem and crown rust made it possible to determine complement virulence genes and their relationship to the population of above pathogens. To slow down development of oat diseases, it is necessary to introduce resistance genes into newly developed oat brands. References 5: 1 Russian, 4 Western.  
[486-7813]

RESOLUTION OF SODIUM AND CALCIUM COMPONENTS OF ACTION POTENTIALS IN DIALYZED  
POND SNAIL NEURONS

Leningrad VESTNIK LENINGRADSKOGO UNIVERSITETA in Russian Issue 21, No 4,  
Nov 83 (manuscript received 9 Apr 82) pp 47-52

SAVCHENKO, A. B., PETROVA, L. A. and VISLOBOKOV.

[Abstract] Voltage clamp and intracellular perfusion/dialysis techniques were employed in studies on the ion channels of isolated neurons obtained from the pond snail *Lymnaea stagnalis*. Examination of 55 neurons led to the identification of 44 neurons with both sodium and calcium channels (type I neurons), 5 with only calcium channels (type II neurons), and three with only sodium channels. The fact that neurons can be differentiated on the basis of ion channels suggests functional differentiation of the neurons with respect to their roles in reflex networks in the pond snail. Figures 4; references 13: 9 Russian, 4 Western.  
[1023-12172]

## ENVIRONMENT

UDC 597.31:591.35

### CAPTURE OF NEW BORN GREENLAND SHARK SOMNIOSUS MICROCEPHALUS (BLOCH AND SCHNEIDER) (DALATIIDAE)

Moscow VOPROSY IKHTIOLOGII in Russian Vol 23, No 6, Nov-Dec 83  
(manuscript received 12 Jan 82) pp 1027-1028

KONDYURIN, V. V. and MYAGKOV, N. A., Kaliningrad Higher Naval Engineering School, All-Union Scientific Research Institute of Sea Fisheries and Oceanography, Moscow

[Abstract] In august, 1981, a deep sea trawl, at a depth of more than 2000 m, captured two Greenland sharks *Somniosus microcephalus* (Block and Schneider), one male and one female. Each was about 1 m in length. External structural features and remnants of yolk in the digestive organs indicated that these specimens were not more than 10-15 days old. This means that the eggs of these Greenland sharks must be larger than the dimensions reported in the literature and their multiplicity consequently less. The Greenland shark thus appears to be ovoviviparous. The young specimens had much softer body and skull cartilage than mature sharks. Morphometric analysis was conducted. References 11: 8 Russian, 3 Western.  
[456-12126]

UDC 577.472

### SHELF BIOLOGY: USE, PROTECTION AND REPRODUCTION OF BIOLOGICAL RESOURCES

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 18, No 5, Sep-Oct 82  
(manuscript received 10 Mar 82) pp 3-14

BEKLEMISHEV, K. V., ZHIRMUNSKIY, A. V., ZAYTSEV, Yu. P. and SKARLATO, O. A., Moscow State University; Institute of Marine Biology, Far Eastern Science Center, USSR Academy of Sciences, Vladivostok; Odessa Section of the Institute of Biology of the Southern Seas, UkSSR Academy of Sciences; Zoological Institute USSR Academy of Sciences, Leningrad

[Abstract] Discussion of shelf biology and management of biological resources of the Bock Sea, White Sea and Far Eastern seas is based on sources in the literature and measures concerning these matters. Substantive areas presented

include: studies in the biology of the White Sea shelf by K. V. Beklemishev, present state and prospects of developing marine resources in the White Sea by O. A. Skarlato, biology of the northwestern shelf of the Boack Sea and use, protection and reproduction of biological resources by Yu. P. Zaytsev and development of studies in shelf biology in the Far East by A. V. Zhirmunskiy. References 37: (Russian).

[472-2791]

UDC 576,8(282.243.7)

#### MICROBIOLOGICAL CHARACTERISTICS OF SOVIET SECTION OF DANUBE RIVER

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 19, No 6, Nov-Dec 83  
(manuscript received 22 Sep 82) pp 69-74

BASHMAKOVA, I. Kh., Institute of Hydrobiology, UkSSR Academy of Sciences, Kiev

[Abstract] Materials used to evaluate water quality and degree of pollution of the Soviet section of the Danube were collected in February, April, July and September 1979 at standard collection stations. Bacteria levels in 1979 varied from 4.5 to 16.3 million col/ml in various seasons of 1979 with an average for the year of 9.5 million col/ml. Maximum development of bacterioplankton was noted in winter. Analysis of results of the tests showed the water in the Soviet section of the Danube to be slightly polluted and beta-mesosaprobic. Water quality improvement was also indicated by a change of the bacillus/cocci ratio in the bacterioplankton toward a preponderance of the latter and a predominance of obligocarbophilic bacteria over heterotrophic bacteria. These findings are compared with indicators for other years since 1958. Figure 1; references 27: 22 Russian, 5 Western.

[458-2791]

UDC 581.526.325.3(262.5)

#### PHYTOPLANKTON STRUCTURE UNDER CONDITIONS OF WATER STRATIFICATION IN BLACK SEA (CENTRAL PART)

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 19, No 4, Jul-Aug 83  
(manuscript received 19 Jan 81) pp 8-17

NARUSEVICH, T. F., Institute of the Biology of Southern Seas, UkSSR Academy of Sciences, Sevastopol'

[Abstract] The goal of this study was to investigate vertical distribution of phytoplankton as a function of thermal stratification of water in the halostatic zone of the Black Sea during summer and autumn of 1976 and 1979. The results showed that during these three years a tendency prevailed towards an increased content of phytoplankton in the center of the western halostatic

zone (Pyrrophyta, Chrysophyta, Bacillariophyta, Flagellate). The greatest change was seen in the content of olive-green cells. Along with annual variations of hydrologic conditions responsible for development of phytoplankton, increased antropogenic effect was noticed on the ecosystems of the sea. In general two peaks were noted in the development of phytoplankton: in or above the thermocline layer and at the edge of the intermediate cold layer. The intermediate cold layer appears to link the areas close to the shores with open sea waters. Figure 1; references 18: (Russian).  
[473-7813]

UDC 574.63:57.68

#### EFFECT OF SURFACTANTS ON MICROBIOLOGICAL PROCESSES IN WATER RESERVOIRS

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 19, No 4, Jul-Aug 83  
(manuscript received 1 Jun 81) pp 23-29

GRIGOR'YEVA, L. V., KORCHAK, G. I., STANKEVICH, V. V., BEY, T. V. and YERUSALIMSKAYA, L. F., Kiev Scientific Research Institute of General and Community Hygiene, UkSSR Ministry of Health, Kiev

[Abstract] Effect of surfactants (SA) on various microbiological pollutants in water reservoirs depends on their chemical structure, starting concentration, breakdown period and duration of their activity. As a rule, it proceeds in the following pattern: property-dose-time-effect. Synthonal inhibited *Escherichia* during the first few days and its action was dose-dependent. Sulphanol in concentrations of 1-10 mg/liter only retarded development of the microbial population. When the SA doses were in the range of 0.05-0.5 mg/liter, pathogenic *escherichia* survived longer than controls. *Enterococcus* was quite stable towards sulphonal in doses of 1-10 mg/liter. Both SA inhibited physiological activity of *Bdellovibrions* in doses greater than 1 mg/liter, possibly resulting in lower self-purification of the reservoirs. The 1-10 mg/liter doses of SA had no effect on T<sub>2</sub> phage virus; only 100-200 mg/liter doses suppressed its viability. In the 100 mg/liter dose sulphanol resulted in destruction of algae followed by multiplication of microbes and heterotrophs. Synthonal stimulated development of autochthonous microflora, but sulphanol exhibited no effect on aqueous microflora. Figures 3; references 6: 5 Russian, 1 Western.  
[473-7813]

UCD 616.981.718

# SOME CHARACTERISTICS OF Q FEVER

Kiev VRACHEBNOYE DELO in Russian No 2, Feb (manuscript received 22 Jun 83), pp 112-114

[Article by V. Ye. Rychnev and V. F. Terent'yev, Department of Infectious Diseases (Professor V. Ye. Rychnev, chief), Voronezh Medical Institute]

[Text] The opinion concerning the undoubted predominance of males among Q fever patients is solidly rooted in the literature (I. L. Kasatkina, 1963; N. I. Fedorova, 1964; K. M. Loban, 1980; etc.). However, there are reports concerning the lack of such a dependence or a relatively significant predominance of women among Q-rickettsiosis patients (G. S. Sukhoyedova, 1962; N. I. Kereyev, 1963; etc.). In regions where Q fever is endemic, the percentage of seropositive results in a CFT [complement-fixation test] with Burnett's antigen in practically healthy women sometimes significantly passed this index in men (M. A. Zeytlenok, 1960; V. F. Terent'yev et al, 1972). The circumstance mentioned is fundamentally important, since it does not exclude the possibility of hypodiagnosis of the disease in women on the strength of different circumstances. Therefore we felt that it would be appropriate to analyze the clinical features of Q-rickettsiosis in women. The diseases were recorded during a period of flareup as well as in conditions of sporadic illness (64 patients total). The age of the patients was from 7 to 87 years; half the patients were 40-60 years old. Among the patients were workers from various enterprises (21), housewives and retired persons (17), students (10), employees (12), and kolkhoz workers (4). The illness took its course in a mild and fairly serious form. The majority of Q-fever patients presented the typical clinical picture: acute onset, fever, headaches, chills, myalgia, sweats, facial hyperemia, hepatolienal syndrome. The nature of the temperature curve corresponded more frequently to the remittent (50%) and erratic (28.6%) types. The fever was of a continuous nature in only 14.3%; temperature was subfebrile in 7.1%. Average length of the fever period was 10.2 days. The patients tolerated the fever satisfactorily. In most of them the acute period of the disease was accompanied by headache (89.1%), repeated chills (73.4%), profuse perspiration (84.3%). In 78.1% of the patients the face was hyperemic; conjunctivitis and infection of the vessels of the sclera were noted in half of them. Not one patient had a rash. An important symptom was myalgia (68.7%) and arthralgia (65.6%). Pains were noted primarily in the region of the lower back and



gastrocnemius muscles. Symptoms such as enlargement of the liver and spleen (in 75.0 and 54.7%, respectively) retro-orbital pains (in 62.4%) and hyperemia of the mouth (53.1%) were observed rather often. Dry cough was observed in 40.6% of the patients; somewhat less often (37.5%) it was accompanied by the secretion of mucous. A head cold was observed in isolated patients (4.7%). In 15.6%, the disease was accompanied by pneumonia; the lung disease with practically identical frequency was right-sided, left-sided or involved both lungs. The pneumonias were not very informative clinically. Thus, pains in the chest, shortness of breath, local weakening of respiration were recorded in 7.8% and 9.4% of patients, respectively. Auscultative changes in the lungs according to the type of dry or moist rales were noted in 17.3 and 15.6% of patients. Pneumonia changes were discovered most often through X-ray examinations. Relative bradycardia, one of the key symptoms of Q-rickettsiosis occurred in only half the patients. At the same time, at the peak of the infectious process a reduction in blood pressure was noted (23.4%). During this period nausea (9.4%) and vomiting (14.1%) were combined with diarrhea, abdominal pains (in 4.7 and 9.4%, respectively). Nervous system affliction was noted: frequent headache was often accompanied by sleep disturbance (50%) and marked vertigo; also recorded were tearfulness, marked asthenia and skin hyperesthesia. Meningeal symptoms and disorientation were observed in 3.1%. The symptoms noted were of a reversible nature and disappeared rapidly after the temperature returned to normal and the toxic manifestations of the disease were removed. In isolated patients sharp pains upon urination remained for a short time, as well as a positive Pasternak's symptom. The appearance of gynecological disorders on the background of Q fever should be noted. In one patient profuse bloody discharge was noted; one had a spontaneous abortion (during the 2nd half of her pregnancy). At the same time, in our observations of pregnant women who had Q fever, when the infectious process took its course naturally, without the use of antibiotics, the pregnancy resolved favorably.

While establishing the basically benign course of the disease in women, we feel that the occurrence of recidivism (7.8%) must be mentioned. This corresponded to the basic wave of the infection according to the number of its basic parameters and frequently was milder and of shorter duration. Complications from Q-rickettsiosis were noted in 6.2% of patients (myocarditis, pancreatitis, abortion). There were no fatal outcomes. It is also important to note that in 3.1% of the patients the process became chronic. Contributing to this factor, in our opinion, were the late diagnosis and hospitalization of the patients and the correspondingly untimely onset of etiotropic therapy, and also the presence of intercurrent illness (toxoplasmosis).

Diagnosis of Q fever in all patients was confirmed by a positive CFT with Burnett's antibody. In one-fourth of patients the antibody titer reached a level of 1/20 --1/40, and only in half did the level of specific antibodies reach a titer of 1/160 --1/320. In the highest dilutions the CFT in women was negative. Analysis of the peripheral blood in most patients revealed leukopenia or normocytosis (96.6%). Relative lymphocytosis and an increased E.S.R. [erythrocyte sedimentation rate] occurred in one-third of

them. The biochemical analysis conducted revealed a moderate increase in transferase activity and a reduction in values of the prothrombin index in 3.1%.

For therapeutic purposes tetracycline in a daily dose of 1.2-1.6 g and rifampicin (0.9 g per day) were prescribed. The original use of penicillin, followed by erythromycin necessitated the appropriate correction. Average bed-day is 16.4. Analyzing on the whole the course of Q fever in women, we feel first of all that it is necessary to mention the conformity of the basic symptoms of the disease in women and in men. At the same time, along with the benign infection in women, a moderately severe course of the disease is observed with reliable frequency, a prolonged fever reaction; less often bradycardia and symptoms of liver disease are observed. The latter circumstance, apparently, is due to more frequent alcoholic liver disease in men. Pathological changes in the urological profile are also observed primarily in women. Uterine bleeding and spontaneous interruption of pregnancy are characteristic of the reaction of the female organism to Burnett's rickettsiosis.

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## BOTULISM

Moscow MEDITSINSKAYA SESTRA in Russian No 2, Mar 83 pp 4-7

PAPINA, G. V., First Moscow Medical Institute imeni I. M. Sechenov

[Abstract] This is a summary of the causes, course and effects of botulism. The genus *Clostridium*, an anaerobic toxin with 7 antigen types, is found in nature, is not contagious but is transferred through its spores and in meat infested with them. They can be killed by boiling 10-20 minutes. Botulism pathogens in natural settings are increasingly numerous in soils from north to south. In general, the presence of botulism can be perceived by smell, color and food texture. Attacks of botulism are acute, with nausea and pain and difficulties of the gastro-intestinal tract and, most seriously, the respiratory system. In the Soviet Union the most common source of botulism are preserved mushrooms and vegetables and sun-cured fish. Preventive measures in preparing these products are recommended.  
[496-12131]

UDC 616.936

## MALARIA (CLINICAL PICTURE, EPIDEMIOLOGY AND PREVENTION)

Moscow MEDITSINSKAYA SESTRA in Russian No 2, Feb 83 pp 28-32

KURALESINA, V. K. and PORYADINA, G. I., candidates of medical sciences, First Moscow Medical Institute imeni I. M. Sechenov

[Abstract] This is a summary of the causes, major locations and varying courses of malaria in Southeast Asia, Africa and South America. While domestic sources of infection are regarded as having been eliminated by 1961, international relations have led to import of the disease. Its life cycle in *Anopheles* mosquitoes and human and other victims is outlined. The high fever, interruption of blood circulation to the brain and arrhythmic breathing are key causes of mortality, especially among children. Differences between tropical malaria and other types are outlined. Moisture and high temperatures are especially ideal in spread of malaria, and the life cycle of the mosquitoes is markedly

accelerated by water temperatures of 20-22°C. Preventive measures include control of sources of infection both in human victims and parasite carriers, elimination of breeding sites, and protection from insects bites by repellents, screening and city planning. Arriving visitors from malaria-infested countries are to be monitored for up to 2 years. Soviet pharmaceutical preparations for treatment are cited.

[496-12131]

UDC 616.98:578.833.1/.3

#### NEW HEMORRHAGIC FEVERS

Moscow MEDITSINSKAYA SESTRA in Russian No 2, Feb 83 pp 32-35

PAPINA, G. V., First Moscow Medical Institute imeni I. M. Sechenov

[Abstract] This is a summary of newly discovered hemorrhagic viral fevers that have been identified in South America and Africa. Bleeding of mucous membranes, organs and body orifices, and general internal bleeding, are symptoms of these acute ailments, first discovered in the Far East as hemorrhagic nephrosonephritis in 1938-40 by Soviet scientists A. A. Smorodintsev, I. I. Rogozin, et al. Special attention is devoted to "Lassa fever", found in West Africa and particularly Nigeria, where it was first identified in 1969. Spread by rodents and humans to other humans, the fever is highly contagious and has 38% mortality. The course of the disease is 1-4 weeks, and is characterized by high fever, weakness, severe headaches, vomiting and diarrhea and other symptoms. The immediate cause of death is commonly cardiovascular insufficiency. For those who recover, recovery begins after 2-4 weeks. Treatment includes rapid quarantine, chemical verification of the disease, and meticulous protection of medical personnel and others who may come in contact. Argentine, Bolivian and the variant called the "Marburg virus" (from its origin in Marburg, FRG) are also described, as are epidemics in Zaire and the Sudan in 1976 that were particularly lethal (90 and 50%, respectively).

[496-12131]

UDC 616.993.162

#### CUTANEOUS LEISHMANIASIS

Moscow MEDITSINSKAYA SESTRA in Russian No 2, Feb 83 pp 38-42

BELOVA, L. V., Skin and Venerological Dispensary No 4, Tashkent

[Abstract] Cutaneous leishmaniasis is an epidemic ailment found in Central Asia and the Transcaucasus. It has been known since ancient times, and its symptoms and course were described at the Russian Surgical Society in 1898 by P. F. Borovskiy. The present article traces its study in Russian and the USSR.

Two pathogens, *Leishmania tropica minor* and *L. tropica major* are discussed. It is transmitted in humans by *Phlebotomus papatasi*, and in many rodents by *Ph. coucasicus* and *Ph. andrejevi*, among others. The clinical stages of the disease, tubercles, ulcers and scars, are described for urban and rural variants. Another form, tuberculoid cutaneous leishmaniasis, was described in 1932 by I. I. Gitel'zon. Results of microscopic study are often required, to distinguish between the disease and its variants and impetigo, tubercle syphilis and other skin diseases. Methods of control include hygiene, destruction of rodents and elimination of mosquitoes, which can also transmit the pathogens. Various pesticides and poisons are suggested, including DDT. A vaccine offering permanent immunity has been developed.  
[496-12131]

UDC 616.831-002-022.578.833.26]-036.8

#### SEQUENCE OF VARIOUS CLINICAL FORMS OF ACUTE TICK-BORNE ENCEPHALITIS

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII in Russian Vol 84, No 2, Feb 84  
(manuscript received 2 Nov 82) pp 202-207

DEKONENKO, Ye. P. and UMANSKIY, K. G., Clinical Section, Institute for Poliomyelitis and Viral Encephalitides, USSR Academy of Medical Sciences, Moscow

[Abstract] This article reports on follow-up examinations of 311 patients who had recovered from various forms of tick-borne encephalitis in locations throughout the USSR. Acute, meningeal and fever forms of the disease were distributed among the studied group, and some of those with meningeal or fever forms later developed the acute form or poliomyelitis. Those with the encephalitic form developed progressive forms of the disease more commonly than those with encephalopolyomyelitic forms. Characteristics of progressive forms of the disease are summarized. Three forms are differentiated: recovery with full rehabilitation and absence of complaints or microsymptoms (in 2 of 52 cases); minor residual effects with reduced work capacity, some brain nerve loss and other disorders without pronounced paresis or other local pathology (in 16); and persistent organic syndromes with marked loss of work capacity and irreversible paresis and myoclonia (34 of 52 patients with this form of the disease). Various losses of intellectual functions; coordination and other disorders were also observed. Eye movement difficulties were very common for some 60% of all patients studied. Minor disorders and other clinical features are also summarized. Some regional variations in the dynamics of tick-borne encephalitis and its after-effects were noted. References 11: 10 Russian, 1 Western.  
[476-12131]

ENCEPHALITIS A IN EASTERN SIBERIA

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII in Russian Vol 83, No 12, Dec 83  
pp 1872-1873

BURTSEV, Ye. M., Irkutsk

[Abstract] The book under review summarizes some sixty years of experience at the Irkutsk Medical Institute with encephalitis lethargica (encephalitis A, von Economo's disease) in Eastern Siberia, and represents an encyclopedic compilation of the clinical and epidemiologic facts. The authors themselves have been actively involved in the clinical and epidemiologic research on this disease entity, and have scored the erroneous assumption of foreign workers who speak of the disappearance of this pathologic entity from human history. They have, in fact, demonstrated the occurrence of new outbreaks in Eastern Siberia in the periods 1920-1922, 1925-1926 and 1933-1939. Even today, acute cases with classical manifestations are still encountered in the USSR. The book ends with the discussion of current therapy and the relationship of encephalitis A to post-encephalitic and symptomatic Parkinsonism.  
[475-12172]

## FOOD TECHNOLOGY

### PRIORITIES AT UKRAINIAN SCIENTIFIC RESEARCH INSTITUTE FOR MEAT AND MILK PRODUCTION

Moscow MOLOCHNAYA PROMYSHLENNOST' in Russian No 3, Mar 84 pp 10-12

[Article by Assistant Director of the Ukrainian Scientific Research Institute for Meat and Milk Production, Candidate of Technical Sciences S.S. Gulyayev-Zaytsev]

[Text] The Ukrainian Scientific Research Institute for Meat and Milk Production is conducting work in the field of cheese-making in two basic areas: creation of new and improvement of existing technological processes and construction of highly productive equipment. Much attention has been directed at minimal-waste and non-waste processes as a basis for improving the use of component parts of milk; small-operation technologies; intensification of cheese ripening based on the use of highly active bacterial preparations; and the mechanization of labor-intensive operations.

Specialists at the Ukrainian Scientific Research Institute for Meat and Milk Production have developed normative-technical documentation for production of such cheeses as hard Ukrainian, Karpatskiy, Bukovinskiy, L'vovskiy, "Slavutich", and soft cheeses that do not require ripening-- neprovskiy, gorodskaya.

For the manufacture of Bukovinskiy cheese, which is related to the Dutch group, special bacterial ferments were created, and technological parameters were established, guaranteeing active development of microflora, which as a result, led to intensification of proteolysis of the caseous mass and production of a product with good organoleptic indices for a period of 30 days. At the present time, the product is manufactured in the amount of more than 9 thousand tons by factories in a number of republics.

In collaboration with workers at the L'vov manufacturing association, the institute created the technology for the L'vovskiy cheese with a fat content of 40 percent. According to organoleptic indices, it resembles Rossiyskiy cheese, but its ripening period is only 30 days. Its output in the Ukraine exceeds 2 thousand tons.

Among the new varieties of cheeses, during the development of which was established the task of increasing the economy of milk fat, the "Slavutich"

cheese is noteworthy, with a fat content of 30 percent and a 1 month ripening period.

The use of ultrafiltration improves economy and rational use of reserves of raw materials. The greatest effect has been achieved with the creation of products, the technology for which calls for a high degree of concentration of the most valuable components of milk resources. In particular, the cream cheese "Metelitsa" was developed with the use of ultrafiltration, which allows increased output of the product by almost 12 percent. Production of this cheese can be organized at municipal milk plants.

Based on the need for rational processing of whey and the creation of non-waste technology in cheese manufacture, protein concentrates DHA-UV and SWP, intended for the output of child and dietetic products, have been developed by the institute.

Dry humanized additive DHA-UV (TR [technical regulation] 49586-79) is a partially demineralized sub-caseous whey with a high content of whey proteins (up to 45 percent).

Dry soluble whey protein SWP (TR 49596-79) was developed from sub-caseous whey by means of its concentration on an ultrafiltrational apparatus with subsequent diafiltration of the concentrate. SWP has good water-retaining properties, which improve the consistency of viscous products, and a high content of biologically valuable whey proteins (up to 85 percent) which makes it feasible for use in the production of dietetic milk and meat products.

Research at the institute in the field of ultrafiltration has led to recommendations for use of membrane techniques and technology in the production of milk products.

As was noted, one of the methods for intensification of cheese production and improvement in their quality is the use of highly-active enzyme, prepared in the form of bacterial concentrates. In accordance with instructions from the USSR Ministry of Meat and Milk Production "On future development of physico-chemical biology and biotechnology and its use in advances in medicine, agriculture and industry", the institute created new forms of bacterial concentrates for use in milk manufacturing and animal husbandry. The technologic parameters for their production were developed for enzymes with a specific species-oriented composition of microflora. Thus, the bacterial preparation "Bukovinskiy" was created which is a concentrate of mesophyllic lactate bacteria, desiccated, by the method of sublimation. Developed by this method, these cheeses are characterized by a soft consistency, distinct taste and aroma because of a uniform fermentation of milk sugar, and acceleration of accumulation of protein substances and aminoacids. The preparation was successfully used in production of cheeses with low temperature secondary heating, such as Bukovinskiy, "Slavutich", L'vovskiy and other Dutch groups.

The bacterial preparation "Bukovinskiy" was developed at the experimental-technologic plant of the institute. Using this technology, in



1981-1983, in plants in the Ukrainian SSR, 32.6 thousand tons of cheese were produced with low temperature secondary heating.

In the United States and the Hungarian Peoples Republic, processing of milk with hydrogen peroxide and subsequent separation with catalase is used to prevent butyric acid fermentation in the production of Emmentaler cheese.

At the Ukrainian Scientific Research Institute for Meat and Milk Production, studies are being conducted on the development of means to use hydrogen peroxide and catalase in the production of cheeses from milk, seeded with butyric acid bacteria. During their investigations, scientists studied the processes for manipulation of the structural-functional and physico-chemical properties of casein, treated with hydrogen peroxide and subsequent separation with catalase. It was found that the stability of proteins, the mean-particulate molecular weight, the mean diameter of the casein particle, the time of rennet coagulation and the amount of separated whey are not altered essentially with concentrations of peroxide of up to 0.05 percent.

Methods for peroxide-catalase processing of milk were examined in production conditions. Samples of cheese were tested in toxic-hygienic studies at the Kiev Scientific Research Institute for Food Hygiene. Authorization was obtained from the USSR Ministry of Health for the use of peroxide-catalase treatment of milk in cheese-making, and this method was formalized by changing No 2 to TR 49 Ukrainian SSR 18-124-80.

Along with augmenting the reserves of cheese-adaptable milk, according to microbiologic indices, treatment with hydrogen peroxide in amounts from 0.03 to 0.05 percent per volume of processed mixture enables an increase in the water-retaining capacity of casein, allowing manufacture of cheese with a softer consistency and increased output by 1-2 percent.

Since 1978, scientists at the Ukrainian Scientific Research Institute for Meat and Milk Production have been conducting studies to create and introduce into manufacturing modern equipment which will provide highly mechanized production lines. Based on an agreement with the Donets machine-building plant, "Prodmash", development has begun for a cheese-maker with a 15,000 l capacity and a horizontal molding apparatus with a capacity for 1,000 kg of cheese mass.

Among the problems on which co-workers at the institute are working is small-operation technology for production of a new soft cheese with reduced fat content. This will require processing buttermilk and complex use of milk proteins on the basis of their thermoacidic precipitation as well as use of milk-coagulable preparations of a microbial origin.

A promising direction in milk economy has been found by use of proteins of plant origin as an additional raw material. However, basic research on the use of protein preparations from herbaceous cultures in the manufacture of cheese showed that they yield a product with an unpleasant taste and an undesirable consistency. In order to avoid this, it is necessary to significantly improve the physico-chemical and organoleptic indices for

preparations of plant proteins (to increase their swelling capacity and solubility, to remove specific after-tastes and odors, etc.). The institute is working to develop preparations of plant protein with properties suitable for the needs of milk manufacturing.

To increase the volumes of cheese production, co-workers at the Ukrainian Scientific Research Institute for Meat and Milk Production are concentrating on the development of minimal-waste and non-waste technology with complex utilization of the component parts of milk and with application of biochemical and physical methods to prepare raw materials, and the creation of highly productive equipment which will ensure mechanization of the fundamental processes for production, and for loading-unloading work.

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## HUMAN FACTORS

### SPEECH-ACTION INTERRELATIONSHIPS IN OPERATIONAL WORK

Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 4, No 6, Nov-Dec 83  
pp 48-53

KRYLOVA, N. V. and BOKOVIKOV, A. K., Institute of Psychology, USSR Academy of Sciences

[Abstract] An evaluation was made of the temporal and logical relationship between speech and motor activity within the framework of an operator's performance, in which the quality of the report was evaluated in terms of the complexity of the task to be accomplished. In many situations in which tracking movements of increasing complexity had to be performed the quality of the oral report improved. This fact was attributed to the concentration of the psychological reserves on the task at hand which, apparently, favored greater mental efficiency. The simultaneous combination of an oral report and motor activity resulted in the situation where the report either preceded or followed the physical manipulation. Figures 2; references 18: (Russian).  
[446-12172]

### EFFECTS OF INDIVIDUAL MNEMONIC CHARACTERISTICS ON PROBLEM SOLVING

Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 4, No 6, Nov-Dec 83  
pp 106-108

GORBUNOVA, L. D.

[Abstract] Psychophysiological analysis of work performance conducted with 81 individuals demonstrated that different operational problems rely on different types of memory. Decoding of multidimensional signal systems within a limiting time frame relies primarily on efficient short-term memory processes. However, operations resting on continuous diagnosis of a variable situation and decision-making responses demands an overall high-degree of mnemonic efficiency and especially long-term retention. Evaluation of individual performance on short-term and long-term memory tests may prove to be of value in determining occupational suitability. References 9: (Russian).  
[446-12172]

# MENTAL STATUS IN RELATION TO SPECIAL CONDITIONS OF ACTIVITY

Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 4, No 6, Nov-Dec 83  
pp 92-105

ZAVALOVA, N. D. and PONOMARENKO, V. A., doctors of psychological sciences

[Abstract] An evaluation was made of the role of mental status in relation to human performance in the man-machine-environment setting, in particular in situations in which there is no in-flight awareness of faulty performance by a pilot. The basic premise is that outside influences, e.g., environmental factors such as hypoxia, affect mentation and lead to erroneous perception and intellectual analysis of sensory inputs. Actions taken on the basis of such an analysis are inappropriate to the situation at hand but, within the framework of the altered mental state, are not perceived as such despite their dire consequences, particularly in in-flight situations. A solution to such problems would require a systems approach treating of mentation separately from normal somatic function as well as in concert with the latter. Such an approach may provide an objective evaluation to the dissociation between subjective perceptions and the quality of analysis which leads to certain actions that may not be appropriate to the situation as a whole. Figures 4; references 38: (Russian).  
[446-12172]

UDC 576.8.097.3+615.356:577.161.5

SOME ASPECTS OF THE IMMUNOBIOLOGICAL ACTION OF AGENT K

Kiev VRACHEBNOYE DELO in Russian No 2, Feb 84, (Manuscript received 10 Oct 83), pp 108-110

[Article by V. V. Smirnov, Ye. L. Mishenkova (Kiev), Institute of Microbiology and Virology imeni D. K. Zabolotniy, UkSSR Academy of Sciences]

[Text] One of the fundamental tasks in identifying the nature of the effect of antibacterial agents on the macroorganism is the study of its immunological reactivity under the influence of these agents, which determines the course and outcome of the disease to a significant degree.

According to present opinion, in order to characterize the immune status of an organism it is necessary to know the number of T- and B-lymphocytes in the immunocompetent organs and their functional activity.

The goal of the research was the study of the effect of Agent K on the expression of T- and B-system immunity reactions characterizing the condition of nonspecific reactivity and natural resistance.

Agent K was obtained at the Antibiotics Department of the IMV [Institute of Microbiology and Virology] of the UkSSR Academy of Sciences imeni A. S. Bondarenko from a culture of the Compositae family. Agent K has antimicrobial properties and is active in relation to gram-positive, acid-resistant and other species of bacteria and dermatophytes that are pathogenic for humans.

All immunological research was done on highly reactive inbred strains of BALB mice weighing 20-25 grams. This strain of mice was chosen on the basis of M. V. Robinson's data (1982) on the expression of cooperative interaction processes between T- and B- cells as a consequence of adequate intensity migration of these cells from the brain and the thymus.

In order to evaluate T- and B-lymphocyte systems, the number of rosette-forming cells under the effect of Agent K was determined. The study of the antibiotic's effect on the synthesis of spontaneous rosettes (E RFC) [rosette-forming cells] was conducted according to Haskill's method (1979). Lymphocytes forming complementary rosettes (E-AC-RFC), were determined according to the method of Mendes et al. (1973). The count of

the rosette-forming cells was accomplished using azure-II-eosin agents under immersion. A cell binding to no less than 3 erythrocytes was considered a rosette. The number of E-RFC and E-AC-RFC cells in  $10^3$  nucleus-containing cells were counted; recounting was done on  $10^3$  lymphocytes.

The dependence of the immune response on the concentration of Agent K and on time periods of its administration were studied by Cunningham's modified high-sensitivity method (1968); determination was made of the number of antibody-forming cells (AFC) in  $10^6$  live nuclear cells placed in special chambers prepared immediately after the experiment.

A 10-50% suspension of sheep erythrocytes (SE) was used as an antigen. During the primary immunization,  $10^6$ - $10^8$  SE were administered; 3 weeks later the animals were immunized a second time with  $10^8$ - $10^9$  cells (for the study of immune response II).

Agent K was administered per os daily at a dose of 50 and 25 mg/kg for 1-7 days for determination of immune response I and 3 weeks for immune response II, at different periods: prior to immunization, during and after it.

Untreated animals served as a control. Immunized animals were used for determination of the immune response.

Results of the experimental analyses were processed by the method of statistical variation, with calculation of the arithmetical mean (M), standard deviation (m) and 95% reliable interval ( $P < 0.05$ ). We judged the correlation of results of immunological reactivity studies in the dynamics of experimental animals that received Agent K and the untreated animals in terms of their effect on the development of immunity.

Introduction of the agent at the same time as immunization or prior to it (to a large degree) activates the formation of immunoglobulin. This is manifested primarily by an increase in the spleen mass and the number of splenocytes per ml of cellular suspension. An increase in mass of the immunocompetent organ and the number of splenocytes by a factor of two was observed when the antibiotic was administered at a dose of 50 mg/kg prior to immunization of the experimental animals. Reduction in the dose of Agent K to 25 mg/kg contributes to weaker splenocyte production--by a factor of 1.4.

It was also established that Agent K in a dose of 50 mg/kg reliably ( $P < 0.05$ ) increases the functional activity of B-lymphocytes, markedly increasing the number of AFC (by a factor of 1.5-3.7).

The introduction of Agent K to the organism of animals significantly (by a factor of 2-3) activates the production of antibodies in the spleens of experimental mice in just 3 days, as compared to the control. Average AFC indices per  $10^6$  splenocytes in the case of administration of the agent before and at the same time as immunization in a dose of 50 mg/kg are

1260 $\pm$ 102 and 863 $\pm$ 35 and in the case of control indices, 452 $\pm$ 10 and 445 $\pm$ 15 AFC, respectively.

The increase in the intensity of AFC formation by a factor of 3-3.7 is reliably observable in 5 days. The average number of AFC's per 10<sup>6</sup> splenocytes when the agent is administered before and at the same time as immunization is equal to 1750 $\pm$ 113 and 1307 $\pm$ 76, respectively, and in the case of control indices--461 $\pm$ 8 and 415 $\pm$ 36.

During the 7-days administration of the antibiotic, a tendency toward a reduction in the activity of B-lymphocytes was observed--from a factor of 2.3 to 1.3, as well as a reduction in intensity of AFC production--up to 990 $\pm$ 51 and 600 $\pm$ 35 cells.

Cutting the antibiotic dosage in half (25 mg/kg) noticeably reduces the production of AFC during all periods of its administration. Thus in 5 days Agent K at this concentration contributes to the formation of antibodies by only a factor of 1.7-1.4. The AFC level in the spleens of experimental mice who received the agent before and at the same time as immunization, is 805 $\pm$ 105 and 615 $\pm$ 47 per 10<sup>6</sup> splenocytes.

Administration of Agent K after immunization, i.e., on a background of immune response formation, does not have a marked effect on the intensity of immunoglobulin formation.

Consequently, the introduction of Agent K before and at the same time as immunization activates the production of immunoglobulins. Activation of the formation of antibody-forming cells is proportional to the concentration of antibiotic administered and is manifested during its preliminary administration. Under conditions of the experiments conducted, intensive antibody formation was observed under the influence of the agent at a dose of 50 mg/kg in 5 days of its administration prior to immunization (Fig 1).

As a result of the study of the effect of Agent K at a dose of 50 mg/kg on immune response II, an insignificant increase in AFC activity was noted. An increase in AFC content by a factor of 1.5 was observed only 5 days after secondary immunization. The average number of splenocytes and AFC per 10<sup>6</sup> cells is 120 $\pm$ 17 and 475 $\pm$ 25 in the experimental group and 80 $\pm$ 11 and 320 $\pm$ 30 in the control, respectively. Thus, in the case of secondary immunization, Agent K has a definite stimulating effect on the immunity system in the organism of laboratory animals (Fig. 2).

The studies conducted on the effect of Agent K on the immune response have shown that administration of the agent per os prior to and at the same time as formation of the immune response stimulates, and on a background of formation after primary immunization does not suppress the B-system and in the case of repeated immunization stimulates T-system immunity. Consequently, the reaction of the organism to the primary introduction of the antigen not only activates but does not reduce the degree of expression of immunological memory for this antigen.

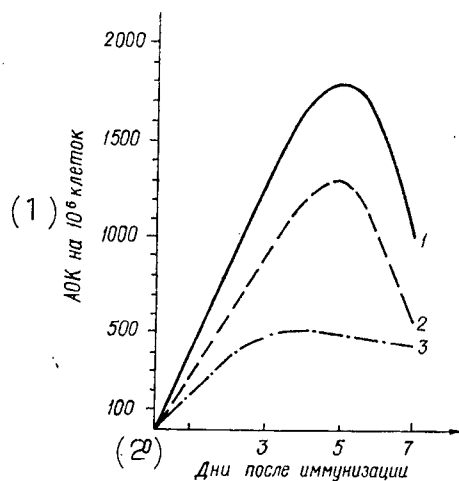


Figure 1. Effect of Agent K on Immune Response I. 1 = administration of 50 mg/kg of the agent prior to immunization; 2 = administration of 50 mg/kg of the agent at the same time as immunization; 3 = control, immunized mice that have not received the agent.

Key:

1. AFC per  $10^6$  cells

2. Days after immunization

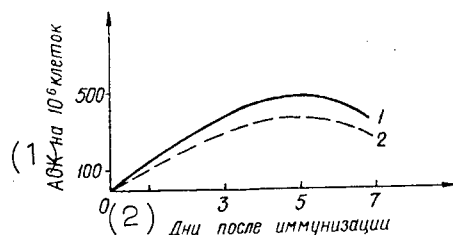


Figure 2. Effect of Agent K on Immune Response II. 1 = administration of the agent at a dose of 50 mg/kg prior to immunization; 2 = control, immunized animals that have not received the agent.

Key:

1. AOK per  $10^6$  cells

2. Days after immunization

Results of the study of quantitative evaluation of T- and B-lymphocytes under the effect of Agent K have shown stimulation of them, determined by an increase in the manufacture of spontaneous rosettes.

The largest synthesis of spontaneous and complementary rosettes is observed in 5 days of antibiotic administration at a dose of 50 mg/kg. The average number of E-RFC is  $855 \pm 13$  and E-AC-RFC is  $537 \pm 15$  at  $P < 0.05$ , whereas in control group animals the absolute level of rosettes is equal to  $352 \pm 11$  and  $254 \pm 6$ .



An increase in T-lymphocyte activity under the effect of Agent K at a concentration of 50 mg/kg is noted in 50%--the average percent content of E-RFC in the experiment and control is  $85 \pm 4$  and  $35 \pm 5$ , respectively, and stimulation of B-lymphocyte activity under adequate conditions--28; the average percent content of E-AC rosette-forming cells in the experimental group is  $53 \pm 5$  and in the control,  $25 \pm 2$ .

Cutting the daily antibiotic dose in half contributed to a reduction in the synthesis of spontaneous rosettes to 24 and 15%--the average absolute content of E and E-AC rosette-forming cells is  $591 \pm 16$  and  $408 \pm 9$  or  $59 \pm 6\%$  and  $40 \pm 3\%$ , respectively.

Thus, Agent K when administered perorally was able to increase the production of spontaneous rosettes in the organism of laboratory animals becoming thereby a unique marker of T-lymphocytes, to improve complementary rosette synthesis and thus to increase the cellular immunity of the organism.

Agent K also stimulates the B-system of lymphocytes, activating within the organism the formation of immunoglobulins and raising humoral immunity tension.

The results of the studies conducted indicate that further study of the effect of Agent K on cellular and humoral functions for the defense of the organism is appropriate.

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# ANTIBODIES TO BACTEROID ANTIGENS IN BLOOD SERUM

Kiev VRACHEBNOYE DELO in Russian No 2, Feb 84 (manuscript received 9 Jun 83)  
pp 111-112

[Article by A. G. Tyshko, M. M. Fal', N. I. Fal', N. N. Marchenko, L. I. Smol'nikova (Kiev), Department of Microbiology (Professor V. P. Shirobokov, chief), Department of Epidemiology (Professor I. N. Morgunov, chief), of the Medical Institute and Microbiology and Virusology Group of the Department of Inflammatory Diseases of the ORL [otorhinolaryngological] Organs (Professor A. I. Tsyganov, chief) of the Scientific Research Institute for Otolaryngology.]

[Text] The improvement in methods for isolating and culturing strictly anaerobic microorganisms such as bacteroids, Fusobacteria, Peptococci, Peptostreptococci and others classified as examples of nonclostridial anaerobic bacteria, has significantly broadened the concept concerning their role in the etiology of various pathological processes. Until recently, these bacteria were considered commensals, living together with aerobe and facultative anaerobe microorganisms, for the most part in the mucous membranes of the respiratory and genitourinary tracts and the large intestine. At the present time the attention of clinic physicians and microbiologists is being drawn to data on the frequent finding of representatives of this group of bacteria in material obtained from patients with inflammatory processes, in various organs and tissues (Mur et al, 1969, Levison, 1973; Gorbakh et al, 1974; Knouk et al, 1979; Lang, 1979; Fayngol'd, 1981).

Isolated reports exist in the literature on the role of nonclostridial anaerobic bacteria in diseases of the ORL [otorhinolaryngological] organs (Dzherom, 1979; Bruk, 1979; Shiyena et al., 1981; Bruk et al, 1981).

Among non-spore-forming anaerobic microorganisms as stimulators of various human diseases, bacteroids are extremely important due to their frequent detection in pathological material and their resistance to a number of widely used antibiotics (Martin, 1974; Li, 1974; Romond, 1976).

An important feature of diseases where nonclostridial anaerobic bacteria are present is that upon bacteriological analysis of the pathological material, several species of anaerobes are discovered, in association with

facultative or aerobic bacteria (Mur et al, 1969; Gorbakh et al; Li, 1974; Bruk et al., 1981), making it significantly more difficult to interpret results with the establishment of an active role for one microorganism or another in the etiology of the pathological process. In this regard, the identification of specific antibodies in the blood serum of patients can serve as one of the criteria for confirmation of an etiological role for the appropriate microorganism in a given illness. Therefore, we set a goal to study the frequency of identification and the level of antibody titres to the antigen *B. fragilis* and *B. melaninogenicus* in the blood serum of donors and also patients with decompensation tonsillitis, peritonsillar abscess and periodontitis in order to discern the role of bacteroids in inflammatory processes of the ORL organs and the opportunities for using serological methods for their diagnosis.

In order to carry out this task, we took 2 strains of bacteroids (*B. fragilis* and *B. melaninogenicus*) isolated from patients. Using Buaven's method, a glucido-lipido-protein complex was extracted from it, which was also used as an antigen in the preparation of erythrocytic diagnosticums (N. N. Marchenko, M. M. Kolesnikov, 1974; B. V. Karal'nik et al, 1977) for setting up a passive hemagglutination reaction (PHR).

A total 168 serums were studied, from which 59 (Group I) were obtained from donors, 36 (Group II) from decompensation tonsillitis patients, 25 (Group III) from peritonsillar abscess patients and 48 (Group IV) from periodontosis patients. The results obtained were subjected to statistical analysis (Ye. V. Gubler, A. A. Genkin, 1973).

In the serums studied, antibodies at a titer of 1:10 and higher were observed to *B. fragilis* antigens in 60 (35.7%) and *B. melaninogenicus* antigens in 66 (39.2%) of cases.

Studying the frequency of detection and the level of antibody titers in the different groups of studied contingents, we found that these indices did not differ substantially in groups I, II and IV to both antigens ( $P > 0.05$ ) and are according to frequency of detection 32.2%, 27.7%, and 27.8% to the antigen *B. fragilis* and 32.2%, 27.7% and 43.7% to antigen *B. melaninogenicus*, respectively. Antibody titers in these groups of persons studied were 28.6; 25.0 and 36.7 to antigen *B. fragilis* and 30.0, 35.0 and 35.2 to antigen *B. melaninogenicus*.

In patients with peritonsillar abscesses (Group III) frequency of detection as well as antibody titer indices were substantially different from the data presented for 3 groups studied ( $P > 0.05$ ) and were 64% according to frequency and 52.4% according to titer to antigen *B. fragilis* and 64% and 73.1, respectively, to the *B. melaninogenicus* antigen.

The results obtained by us are in agreement with data from other authors (Bekman et al, 1977) detecting antibodies to bacteroids in the blood serum of donors in 30 % of those studied and in 70% of surgical and gynecological patients. The detection of antibodies at low titers in some of the donors and certain groups of patients can be explained by the fact when these

bacteria grow in the natural cavities of practically healthy people they can in a number of cases have an antigenic effect on the organism (Khofstad, 1974). As far as the high indices are concerned, for frequency of detection as well as for the level of antibody titers to *B. fragilis* and *B. melaninogenicus* in patients with peritonsillar abscesses, this can be interpreted, in our opinion, as the result of the etiological role of the indicated bacteria in these diseases.

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#### EXPERIMENTAL COXSACKIE B1 VIRUS INFECTION IN IMMUNOLOGICALLY ALTERED MICE

Prague ZHURNAL GIGIYENY EPIDEMIOLOGII MIKROBIOLOGII I IMMUNOLOGII in Russian  
Vol 27, No 2, Apr-Jun 83 (manuscript received 12 May 82) pp 151-156

PETROVICOVA, A., Institute of Preventive Medicine, Bratislava, CSSR

[Abstract] Intragastric infection with Cocksackie B1 virus was employed in studies on four-week-old SPF mice to determine the time course of viremia and histologic lesions in relation to the immune status. The highest level of viremia were seen in mice treated with antilymphocytic serum (ALS), and the lowest in mice treated with antipancreatic serum (APS; nonspecific immunostimulant). In the ALS-treated and control mice viremia persisted for ca 10 days, but only for about two days in the APS animals with lymphocytosis. In addition, Cocksackie B1 induced more pronounced histologic changes in the internal organs and persisted in the tissue for a longer period of time in the mice immunosuppressed by ALS than in the control and APS-treated mice; furthermore, in the latter group of mice the histologic changes were unremarkable and reversible. For example, lymphocytic infiltration and myofibril necrosis was seen in 96% of the ALS animals, 78% of the control animals, and in only 40% of the mice treated with APS. Since these observations were made within 15 days of infection, they indicate the importance of lymphocytes in regulating Cocksackie B1 virus dissemination and multiplication in the target tissues prior to the onset of a response. Figures 4; references 9: (Western).  
[471-12172]

#### EFFECTS OF MULTIPLE INJECTIONS OF IMMUNE STAPHYLOCOCCAL PREPARATIONS ON LOCALIZED STAPHYLOCOCCAL INFECTIONS

Prague ZHURNAL GIGIYENY EPIDEMIOLOGII MIKROBIOLOGII I IMMUNOLOGII in Russian  
Vol 27, No 2, Apr-Jun 83 (manuscript received 5 May 82) pp 207-214

YEGOROVA, N. B. and KORZAYA, L. I., Moscow Scientific Research Institute of Vaccines and Sera imeni I. I. Mechnikov

[Abstract] Various immune staphylococcal preparations were injected subcutaneously into outbred mice to determine their effects on localized infections when administered before or after an infection. Injection of water-extracted antigenic staphylococcal complex (ASC), native and adsorbed anatoxin,

staphylococcal antiphagin, or formalized bacterial vaccine did not 'sensitize' the animals, but in some cases the course of the subsequent experimental infection was milder. Comparison of the results obtained with ASC and the bacterial vaccines derived from highly virulent and relatively weakly virulent staphylococcal strains indicated that the latter strains yielded preparations offering a higher degree of protection. Use of these preparations as therapeutic agents showed them to be effective in limiting the size of the abscess and in decreasing the number of necrotic foci. With the exception of adsorbed anatoxin which caused an increase in the degree of edema in an extremity, all of the other preparations (including unadsorbed anatoxin) led to a decrease in edema which can, therefore, be used as an indicator of protection.

References 12: (Russian).

[471-12172]

COMPREHENSIVE EPIDEMIOLOGIC PROGRAM FOR STREPTOCOCCUS PYOGENES CONTROL.  
PART 6. RELATIONSHIP BETWEEN INCREASED ZYMOSAN SUSCEPTIBILITY AND IMMUNITY  
AGAINST GROUP A STREPTOCOCCUS

Prague ZHURNAL GIGIYENY EPIDEMIOLOGII MIKROBIOLOGII I IMMUNOLOGII in Russian  
Vol 27, No 2, Apr-Jun 83 (manuscript received 19 Feb 82) pp 227-237

KAHLICH, R., SVEC, M. and PROCHAZKA, O., Military Institute of Hygiene,  
Epidemiology and Microbiology, Prague, CSSR

[Abstract] Twenty human volunteers of both sexes were employed in a continuation of studies on nonspecific and specific factors in immunity against *Streptococcus pyogenes* [Kahlich R., et al., J. Hyg. Epid. Mic., Immunol., 26:396-404, 1982]. The present investigation involved correlation between the effects of zymosan on the results of migration-inhibition tests, using micro- and macrophages derived from individuals either immunized or not with Mannozyne (Human, Hungary; *Saccharomyces cerevisiae* glucomannan suspension). The allegedly nonspecific effects of zymosan were attributed to some common antigenic determinant shared with streptococci, as evidenced in the migration-inhibition tests. Immunization with Mannozyne evidently provided a booster effect and was responsible for the prolonged effect which persisted for five months. Figures 1; references 13: 9 Czech, 4 Western.

[471-12172]

## LASER EFFECTS

UDC 617.089.843-06-084:615.849.19.03

### USE OF LOW ENERGY LASER RADIATION TO STIMULATE GRAFTING OF NEOTYMPANIC TRANSPLANTS AFTER TYMPANOPLASTY

Moscow VESTNIK OTORINOLARINGOLOGII in Russian No 1, Jan-Feb 84  
(manuscript received 19 Jul 83) pp 25-29

BYKOV, V. L., Department of Hearing Improvement Surgery, Kiev Scientific Research Institute of Otolaryngology

[Abstract] In order to stimulate healing, postoperative tympanoplasty patients were subjected to a low energy helium-neon laser, at  $10-12 \text{ mV/cm}^2$  for five minutes per session. Twenty patients were irradiated beginning five days after surgery. In 17 of the subjects the inflammatory reaction was enhanced, the amount of wound discharge increased and after the third session the panniculus became pale. The number of neutrophils in the wound discharge was increased as was the quantity of lymphocytes. The elevated alkaline-phosphatase and moderate acid-phosphatase levels also indicated inflammation. The transplant had a lower temperature than surrounding tissue. These unfavorable results led to a change in the experimental design, with irradiation commencing 12-14 days post-operatively, when some transplant vascularization is expected. In the 59 patients so treated activation of reparative regeneration processes, regeneration of vascularization and decreased discharge were noted. Histocytes, monocytes and epithelial cells were increased, while the level of neutrophils and lymphocytes decreased. Phagocytosis was activated and the number of decomposing cells was lowered. Acid-phosphatase levels decreased, while alkaline-phosphatase and peroxidase were elevated. Glycogen levels and transplant temperature increased. After five sessions it became difficult to obtain wound discharge, due to extensive vascularization of the panniculus. By the seventh to ninth sessions the transplant was completely covered with epidermis. In four cases the response to the laser was weak, so that 11-16 sessions were needed. Widespread use of low energy lasers to stimulate healing of surgical wounds after tympanoplasty is recommended. References 28: 14 Russian, 14 Western.  
[452-12126]

USE OF LOW ENERGY HYPOTENSIVE LASER THERAPY IN INITIAL OPEN ANGLE GLAUCOMA

Odessa OFTAL'MOLOGICHESKIY ZHURNAL in Russian No 7, 1983 (manuscript received 17 Jan 83) pp 408-410

KOLOMIYETS, A. I., junior science associate, Odessa Scientific Research Institute of Eye Diseases and Tissue Therapy imeni Academician V. P. Filatov

[Abstract] In order to develop less traumatic methods for lowering intraocular pressure (IOP) using lasers, treatment methods previously developed in rabbits, that involve low energy without tissue damage, were applied to human glaucoma patients. The subjects were 51 patients (63 eyes) with initial open angle glaucoma, normal vision and elevated IOP which could not be normalized with miotic drugs. They were subjected to 30-100 ruby laser pulses of 0.01-0.1 J per session, focused on the drainage area through the conjunctiva and the sclera, for 3-4 sessions at 3-5 day intervals. In 23 of the eyes, IOP was normalized after the first session. Treatment regime and miotic use were adjusted, depending on the daily IOP curve. In 29 eyes, IOP normalized after 3-4 hypotensive laser therapy sessions, while for 11 eyes only partial success was achieved. After 2.5 years, 21 patients retained normal IOP, while 20 patients required a second course of therapy after about 6 months. The overall success rate was 82.6%. No negative effects were seen. Low energy hypotensive laser therapy is recommended for the treatment of initial forms of open angle glaucoma. References 20: 14 Russian, 6 Western.  
[453-12126]

UDC 340.627:616.71-008.949.5:546.683]-07:543.544.2

USE OF LASER ATOMIZER IN DETERMINATION OF BONE THALLIUM CONCENTRATIONS BY ATOMIC ABSORPTION SPECTROSCOPY

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 1, Jan-Mar 84 (manuscript received 12 Apr 83) pp 39-40

VUL'FSON, Ye. K., DVORKIN, V. I. and KARYAKIN, A. V., Institute of Geochemistry and Analytical Chemistry imeni V. I. Vernadskiy, USSR Academy of Sciences, Moscow

[Abstract] Determinations were made of the thallium concentration in the bones of an exhumed subject in which laser atomizer was employed in place of ashing for the atomic absorption spectrometry. Comparison of the analytical results obtained by neodymium laser (8 J pulse energy, 1.2 msec pulses) atomization and ashing at 400 and 600°C showed that in ashing 80% or more in the thallium becomes volatilized and lost to analysis, depending on the bone. These observations indicate the utility of laser atomization of samples for analysis by atomic absorption. Figures 1; references 8: 6 Russian, 2 Western.  
[449-12172]



# TECHNIQUES AND INITIAL RESULTS IN LASER PHOTOCOAGULATION OF ANAL FISSURES

Ashkhabad ZDRAVOOKHRANENIYE TURKMENISTANA in Russian No 9, Sep 83 pp 3-5

BABAYEV, O. G., No 3 Chair of Surgery, Turkmen Order of Peoples Friendship State Medical Institute

[Abstract] Conditions are described for the use of defocused CO<sub>2</sub> laser (Skal'pel'-1; 20-25 W output) in the treatment of anal fissures in 56 male and female patients 17 to 70 years old. Three irradiations (5-10 sec) from a distance of 10-15 cm were sufficient for a complete cure in all patients: in most patients pain disappeared within 3 days and complete healing with smooth scar formation was obtained in 7 to 12 days. Five to 13 month follow-up on 20 patients showed only one case of anal fissure reappearance, which was treated successfully by laser photocoagulation. Laser photocoagulotherapy can, therefore, be recommended for the management of anal fissures and is a procedure that can be accomplished under ambulatory conditions.  
[518-12172]

MARINE MAMMALS

UDC 599(26)591.5

DISTRIBUTION, ABUNDANCE AND FOOD REQUIREMENTS OF MARINE ANIMALS IN SEA OF OKHOTSK

Vladivostok BIOLOGIYA MORYA in Russian No 5, Sep-Oct 83 (revised manuscript received 9 Aug 82) pp 13-20

SOBOLEVSKIY, Ya. I., Laboratory of Applied Biocenology of the Pacific Scientific Research Institute of the Fishing Industry and Oceanography, Vladivostok

[Abstract] The numbers, distribution and food consumption of marine mammals in the Sea of Okhotsk at the beginning of the 20th Century and in recent years are tabulated, compared and discussed. Annual food consumption by marine mammals in the sea has declined from 6-6.7 million tons in 1900 to 2.5 million tons per year now due to the decrease in the number of species. Whales and seals now consume 2.1 to 2.5 million tons of food annually, including 1.3 million tons of fish and cephalopods. Greater harvest of the white whale, which consumes large amounts of salmon, and of harbor seals is recommended. Some of the industrially-valuable species include chum, pink salmon, Alaska pollack, herring and others. References 33: 29 Russian, 4 Western.  
[461-2791]

MEDICINE

UDC 614.2[47 + 57]:008

TO STRENGTHEN LABOR DISCIPLINE

Moscow MEDITSINSKAYA SESTRA in Russian No 3, Mar 84 pp 3-5

[Article by G. V. Dvorkin]

[Text] The communistic organization of public labor is maintained and as time goes on will be maintained even more by the free and conscious discipline of the workers themselves. Vladimir Il'ich Lenin uttered this opinion, as everyone knows, soon after the Great October Victory, in the second year of Soviet power. At the same time he wisely indicated that the new discipline was not falling from the heavens nor was it born of good intentions and that the task of the revolutionary transformation of society and social relations and the formation of the new man could on no account be resolved through the heroism of an isolated impulse, but requires the most prolonged, most persistent and most difficult heroism of mass and everyday work.

It is in just this way, in the spirit of Leninist principles, that the party approaches the questions of strengthening socialist labor discipline, with the historically unprecedented scale of our economy, and under the conditions of mature socialism. This came through especially intensely and comprehensively in resolutions of the November (1982) and June (1983) CPSU Central Committee Plenums, which were met with warm approval and support by the Soviet people.

In characterizing the decisive role of economics in the structure of a socialist society, V. I. Lenin chose two important factors in its growth: plan and discipline. He considered plans to be the accumulated will of the workers and discipline to be the nail of the entire economic construction. The subsequent accomplishment of plans for socioeconomic development under the leadership of the Communist Party and strict discipline in implementing them brought the Soviet nation to the brink of mature socialism--today's highest achievement of humanity's historical progress.

The November (1982) CPSU Central Committee Plenum required that a decisive struggle be waged against any breaches of party, state or labor discipline. This was also discussed at the June (1983) CPSU Central Committee Plenum, and not just as a simple wish of some sort; it is a pressing and objective necessity.

The building of a developed socialist society in our country is expressing itself as a new important phase in the strengthening of socialist labor discipline. Providing organization and order in production is becoming one of the important conditions in the modern era for the further development of economics, a pledge of successful implementation of plans for social and economic development designed to improve the people's welfare.

The urgency of the problem is determined by the huge increase in production scales, complicated economic relations, large losses borne by the national economy due to idle time, absences from work, administration-authorized leaves, and personnel turnover. The significance of each hour and each minute of work time has increased, in the sense that one lost minute on a country-wide scale at the present time is equal to the loss of an entire day for more than 300,000 workers.

Another important feature is the need for educating the people in the communist attitude toward labor, a high level of consciousness, and an increase in labor and political activity.

This is why a breach in labor and production discipline should be considered a deviation from the performance of a USSR citizen's duty to work conscientiously. "The essence of socialist discipline is in the full performance of each person at the place where he works," said Comrade Yu. V. Andropov at a CPSU Central Committee meeting with party veterans.

The 26th Party Congress and subsequent CPSU Central Committee Plenums indicated the need for constantly strengthening labor discipline and improving order and organization. The CPSU Central Committee, the USSR Council of Ministers and the VTsSPS [The All-Union Central Trade Union Council] adopted a decree "Increasing Work Through the Strengthening of Socialist Labor Discipline," and the USSR Council of Ministers and the VTsSPS issued a decree "Supplementary Measures for Strengthening Labor Discipline." Measures provided for therein, in combination with rights granted by the Labor Collectives Law enacted as of 1 August, 1983, created the necessary conditions for a decisive control over any breaches of discipline and order in production. They provide for the active application of the forms and means of material and moral stimulation for conscientious workers and of administrative and economic influence on those who disrupt labor discipline. This is not at all a question of a short-lived campaign. The problem posed is an increasingly large one, and long-term methods and means are being considered for its solution.

Educational and administrative measures recently adopted on the party's initiative have strengthened labor discipline and order in production. The CPSU line on strengthening labor discipline, order and organization was also approved by public health workers. They understand very well the

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\*"Vsegda v stroyu" [Always on Duty] Meeting at CPSU Central Committee with party veterans on 15 August, 1983, Moscow, 1983, p. 10.

significance of honest and conscientious labor in accomplishing the grandiose plans of economic and social construction. Indeed, our society can distribute only what it produces. We have no other sources for improving prosperity. Consequently, the better we handle the task of preserving and improving the health of the nation, cutting work disability time losses, and increasing the periods of active work activity on the part of the Soviet people, the more and better we promote the strengthening of the economic and defense potential of the country.

Protecting the health of the Soviet people is one of the important socialist tasks of developed socialist society. In the Accountability Report of the CPSU Central Committee to the 26th Congress of the Communist Party of the Soviet Union it says: "Everything must be done so that a Soviet citizen can always and everywhere receive timely, skilled and sensitive medical care."

The occupation of medical worker enjoys universal acceptance in our country. It can be said without exaggeration that Soviet physicians worthily fulfill their lofty and very difficult duties. There are today in our health service more than six million medical workers. Among these, more than one million are physicians and approximately three million are mid-level medical workers. Almost one-third of all physicians in the world are working in the Soviet Union today.

Health department workers fulfill an enormous number of tasks every day. This means 8.5 million people at doctors' offices, 210,000 calls for emergency care, 42,000 operations, 328,000 x-ray examinations, 3.5 million different laboratory analyses. Fourteen thousand babies a day are delivered. Thanks to the efforts of medical workers and the enactment of large-scale socioeconomic measures in the country, positive changes have been achieved which contribute to an improvement in the population's health.

There are, however, still a great deal of unresolved problems. Medical workers understand well that the sphere of their work deeply affects and upsets every person, and it is for just this reason that any defects in the work of the health department are intolerable. All successes, achievement and shortcomings of the health service depend in the final analysis on people, on their knowledge and skills, responsibility and discipline. Therefore, an ever-increasing amount of attention is given to further increasing the occupational growth of personnel, and the culture of the medical service. New requirements present new tasks in the organization of the teaching process for medical workers. This year a transition has already been made in the medical VUZes to new teaching plans providing for significant improvement in the practical training of students.

The establishment of periodic certification for physicians has a great deal of significance as far as skill improvement is concerned. Certification is actively being carried out in the Ukrainian SSR, the Belorussian SSR, the Armenian SSR and the Latvian SSR and in a number of RSFSR oblasts.

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\*"Materialy XXVI s'yezda KPSS" [Materials of the 26th CPSU Congress], Moscow 1981, p. 61.

Directors of health service institutions are taking note of its extreme effectiveness.

A great deal is being done in each health service collective to create an environment where disruptions in the norms of communist morals and morality are not tolerated, so as to completely eliminate patient complaints of coarseness and inattention from individual medical workers. The foremost collectives have come forward with the initiative "In the trade union group--not one person who breaks labor discipline and medical ethics." This initiative will be broadly assimilated into the daily work of health service organizations and institutions.

Medical collectives are objectively evaluating the shortcomings in their work and conducting a systematic search for additional resources for increasing the culture and quality of medical care for the population and the health resort treatment service and for improving the production of medicines and medical technology.

It would be hard to overestimate the sociopolitical significance of resolutions of the November (1982) and June (1983) Party Central Committee Plenums and decrees by the CPSU Central Committee, USSR Council of Ministers and the VTsSPS concerning questions of strengthening labor discipline and the USSR Labor Collectives Law. They touched upon the deep layers of organizational, ideological and educational work of the party, and its economic and social policy, and determined means and methods for solving an entire group of problems in the interests of improving developed socialism, for the good of all Soviet people.

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PRESENT-DAY SYSTEM OF INFLUENZA CONTROL

Moscow: MEDITSINSKAYA SESTRA in Russian No 3, Mar 84 pp 5-9

[Article by Professor A. S. Shadrin, USSR Ministry of Health All-Union Scientific Research Institute for Influenza, Leningrad]

[Text] The medical and socioeconomic significance of influenza is not limited to the scope of the disease and the work time lost because of it. It is very likely that just as much harm is done by the exacerbating effect of influenza on bronchopulmonary, cardiovascular and other widespread disease. Influenza epidemics occurring almost every year create emergency overloads in the basic links of the medical network, disorganize their normal functioning and are responsible for significant difficulties in the operation of various sectors of the national economy.

Effective influenza control by means of mass population immunization with live intranasal vaccine was begun in the USSR in 1954. Subsequently, the anti-influenza arsenal was supplemented with anti-influenza gamma globulin (1967), leukocytic interferon (1969), oxolinic ointment (1970) and live oral vaccine for children (1970). All these agents have been and are being produced in sufficiently large quantities for protecting tens of millions of people from influenza every year. When administered properly, under strictly controlled scientific observations, each agent guarantees a reduction in the influenza disease rate by a factor of 1.5-2 or more.

According to laboratory diagnostic data, influenza comprises 40% of the total number of ORZ [otorhinolaryngological diseases], with parainfluenza, adenoviral and mycoplasmic infections each comprising 10% of these etiological forms.

Intensification of migratory processes increases the risk of contagion, but improvement in the medical service and social insurance and an increase in the overall and medical culture of the population are contributing to more complete identification and registration of patients. Prior to 1977, two viruses, A and B, were responsible for influenza in people (Group C is seldom encountered). As of 1977, it has been observed that three influenza viruses are circulating simultaneously: A(H1N1), A(H3N2) and B. The letters H and N stand for the type of influenza virus surface proteins:

hemagglutinin (H) and neuraminidase (N).

Despite mass administration of fairly effective agents, efficacy of the measures has proved insufficient in a number of cases, due to the fact that improper administration of the agents inhibits realization of their potential effectiveness. The theory and practice of epidemiology teach that in the case of infectious diseases such as influenza, when the populations of host (man) and parasite interacting in an epidemiological process are not of the same kind and are multivariant in relation to one another, only an effect on the population as a whole, i.e., on the territorial community, can exert an effective influence on the epidemiological process. The anti-influenza protection inevitably proves to be brief for a small percentage of the population, inasmuch as the circulation of the pathogen is virtually unlimited and because strains capable of overcoming the synthetic defense of a small segment of society are formed comparatively rapidly from its heterogenous population.

Until very recently, the lack of proper consideration given to this situation led to the fact that anti-influenza agents were not used extensively enough. The question of universal administration of a vaccine in effective combination with other anti-influenza agents was not resolved. Available live vaccines were used only for the immunization of healthy adults. Yet without inoculation, this group would be less vulnerable than others (children, the chronically ill, the elderly) to influenza and its complications and adverse consequences.

It became obvious that existing scientific procedural and organizational principles for protecting the population from influenza were in need of radical revision. The urgency of this task increased, particularly in connection with the start of the mass production and use of basically new and more effective agents--inactivated vaccine (1977) and remantadine (since 1975 for treatment, 1980 for prophylaxis). Moreover, the assimilation into practice of new agents for the prophylaxis and etiotropic treatment of influenza in addition to previously existing ones, expanded the possibilities for the development of a more efficient system for protecting the population from this infection.

A system such as this, providing the most complete realization of each anti-influenza agent's potential effectiveness, was devised at the All-Union Scientific Research Institute for Influenza. The system of anti-influenza measures is a massive one in terms of territorial principle, i.e., it embraces all social and age population groups in a city or region: the working population, children, retirees, the chronically ill, departmental service contingents. At the present time, this condition cannot be met on the basis of one or several anti-influenza agents. For example, certain agents are authorized for adults only (remantadine) or for schoolchildren and adults (inactivated vaccines).

In this regard, the system is universal in terms of agents and methods used and differentiated in terms of population contingents that it protects. An anti-epidemic system includes three consecutive steps: vaccination of



the population during the period prior to the epidemic, emergency prophylaxis and early treatment during the epidemic. These special anti-influenza operations are carried out in conjunction with the enactment of overall organized and restricting public health methods. Overall measures provide for the extension of medical care to patients during the period when the epidemic disease rate is on the upswing, development of a supplementary bed network for hospitalization of the seriously ill, patient quarantine, ridding the environment of the sources of infection (disinfection), hygiene education, etc.

Vaccine prophylaxis has been and still is the fundamental overall system for protecting the population from influenza. During its planning and implementation, the population of a city is arbitrarily divided into four groups. They are: workers at major enterprises and institutions, those at smaller projects, non-working adults and children. Division such as this takes into consideration the variable effectiveness of influenza vaccines, the list of contraindications, ease of mass administration, etc.

Workers and employees at major enterprises are inoculated for the most part with inactivated whole-virus vaccines (chromatographic or centrifuged) by the intracutaneous jet method, using injectors without needles. The inoculation dose (0.1-0.2 ml) contains 3-4 mcg of hemagglutinin from each of 2 or 3 viruses A (H1N1), A(H3N2) and B. The inoculation is given once.

Mass administration of inactivated vaccines has become possible thanks to the presence of a large enough quantity of needle-free injectors in medical institutions. The virtually painless and completely safe introduction of the vaccine to surface layers of shoulder skin does not cause a negative attitude toward injection on the part of those inoculated, as opposed to syringe injections. The inoculation takes fractions of a minute, and when the flow of those to be inoculated is properly organized, an inoculation brigade with 2 injectors can immunize up to 2000 persons per hour.

Soviet whole-virus vaccines are produced in 250 to 500-dose bottles for mass inoculation. People who have remained uninoculated for whatever reasons (temporary contraindication), are subsequently inoculated with live intranasal vaccine. The inoculation is done by health point workers.

In recent years, live monovaccines containing A(H1N1), A(H3N2) and B vaccines have been produced. Immediately prior to inoculation, monovaccines are cultured and mixed according to instructions for administration of the agent, and the vaccine mixture is introduced to the nasal passages twice, by means of an atomizer or a pipette in a dose of 0.5 ml, with a 20-30 day interval between doses.

Live intranasal vaccine is also used to immunize adults and adolescents (over 15) in small production collectives, including students in the 9-10th classes.

Children aged 3-14 are inoculated at nurseries and in school (1-8th

classes) with live pediatric vaccine comprised of viruses A(H1N1) or A(H3N2). As of 1983, children aged 11-14 can be inoculated with inactivated live vaccines of the whole-virus type (like adults). Inoculation points have been established in polyclinics where for the most part inactivated vaccine of the decomposition type--adsorbed anti-influenza chemical--is used for the immunization of the nonworking population. It is produced in ampules and administered subcutaneously with a syringe. Nonworking adults (retirees, housewives) comprise up to 25% of the population in individual cities. A high fatality rate from influenza and its complications is observed for this group. Therefore, the protection of this contingent is extremely important, although it is more difficult in terms of organization and procedure.

Taking into consideration temporary and permanent contraindications and organizational difficulties and other circumstances, we have been able to inoculate up to 70% of the total city population with all vaccines. Estimates indicate that when inoculation coverage of the population is of this scope, a flu epidemic could not develop if the vaccine effectiveness index were around 3.0 (effectiveness coefficient approximately 66%).

Unfortunately, the potential effectiveness of existing vaccines has not reached this level. Inactivated vaccines under favorable conditions, i.e., when the vaccine and epidemic viral strains match one another, reduce disease indices on an average by a factor of 2, and live vaccines by a factor of 1.5. Therefore, early vaccine prophylaxis must be supplemented with emergency influenza prophylaxis directly during the period of the epidemic. Two chemical agents (remantadine and oxolin) and two immunoagents (leukocytic interferon and donor anti-influenza gamma globulin) are produced and used for this reason. Their efficacy, volume of production, cost, indications and contraindications are not the same. Remantadine is used prophylactically at a dose of 1 tablet per day (0.05 g) and oxolin in the form of .25% ointment used for antiviral protection of the nasal mucus membranes twice a day. It is recommended to resort to leukocytic interferon to protect children under three years old. It is introduced to the nasal passages with an atomizer or a pipette twice a day. Donor anti-influenza gamma globulin is injected one time at a dose of 1 ml in very young children when this disease flares up in obstetrical departments, pediatric hospitals and childrens' homes.

From an organizational standpoint, it is recommended that emergency influenza prophylaxis be divided into planned and focal. In the first case, the collectives and individuals mentioned earlier who were not inoculated against influenza the first time around are subjected to influenza protection, especially persons with a high risk of unfavorable consequences from the disease (the chronically ill, the elderly, children in a weakened condition). The course of planned prophylaxis lasts 20-30 days, until there is a falloff in the epidemic wave.

Focal prophylaxis is done in the patient's immediate surroundings: the family, dormitory, hospital ward or boarding school. The course of the disease takes 1-2 days if the patient is isolated and 5-7 days if he stays

where he is. The best agent for emergency influenza prophylaxis is remantadine.

For independent use, 0.25% oxolin ointment in tubes is convenient. This agent is recommended for the protection of people for whom remantadine is contraindicated, particularly children of school age.

Influenza prophylaxis for children under three years old is aimed at using leukocytic interferon and anti-influenza gamma globulin from donor blood. Interferon is dropped into the childrens' nasal passages twice a day during an influenza period or another OPZ flareup in childrens' collectives. Gamma globulin is injected intramuscularly at a dose of 1 ml; its protective action lasts for 2 weeks.

Remantadine and anti-influenza gamma-globulin give not just a prophylactic, but also a therapeutic etiotropic effect in the case of influenza. The prescription of remantadine for adult patients from the early hours of illness almost completely wards off the development of influenza complications and reduces the length of each case of disease-related work disability by approximately 2 days. Delay in starting treatment sharply reduces its effectiveness. Use of remantadine is already futile after the third day of the illness. In order to guarantee early treatment of influenza with remantadine, it is recommended that this agent be given to the patient for a treatment course at the place where he goes first for care (home, polyclinic, hospital health points, etc.). The course of remantadine treatment takes 3 days. Daily adult dose is: 6 tablets (0.3 g) the first day, 5 tablets the second, and 4 tablets the third day.

Anti-influenza gamma globulin is basically used for the treatment of serious forms of influenza, primarily in children.

The new system for protecting the population from influenza has received a positive evaluation and the approval of practical public health workers. This has enabled its recommendation as the scientific and procedural basis for a state program of measures for protecting the country's population from influenza.

In Sverdlovsk, Perm, Frunze, Minsk, Kharkov and other cities where the system of anti-influenza measures was implemented most successfully, the influenza A disease rate was reduced by a factor of 1.5-2 from 1981-1983. By 1985, the new system will encompass cities with populations of over 50 million people. This apparently makes it possible to significantly reduce the intensity of the influenza epidemic process, and to keep its adverse consequences to a minimum in all social and age groups of the populations.

It should be mentioned that the initiative and purposeful interest of the practical public health agencies and institutions determines to a large degree the level of administration and efficacy of the protective measures. Annual inoculations against influenza in the autumn and winter months and organization of medical care for patients and of emergency prophylaxis during an epidemic that has already started are so massive in character and

are so labor-intensive that their successful accomplishment is not within the power of a single medical service. Efficient care and the participation of state and economic institutions as well as public organizations is necessary. Another important condition is that the mass anti-influenza measures be counted on in the conscious attitude and active participation of the entire population, as a consequence of which influenza control under present-day conditions assumes the character of an important social measure. Realization of this fact will depend to a significant degree on the purposefulness and persuasiveness of our medical education work.

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# PSYCHOLOGICAL PROTECTIVE MECHANISM IN ALCOHOLISM

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII in Russian Vol 84, No 2, Feb 84  
(manuscript received 29 Jan 83) pp 244-249

BEKHTEL', E. Ye., Narcological Dispensary No 1, Moscow

[Abstract] Recent times have seen numerous Soviet studies of the role of personality in the appearance and development of chronic alcoholism, as well as specific psychological changes provoked by abuse of alcohol. The present article summarizes the author's findings regarding psychological protective measures commonly encountered by Soviet scientists in examining alcoholics. Major categories discussed include ignoring drunkenness, shifting of attention from drinking, partial perception of the problem, projection of the subject's problems to others as a form of rationalization, belittling the problem, motivational rationalization emphasizing only factors the subject wants to recognize, and aggressive behavior toward those who try to help. Recognition of the problem and eventually the assertion of "the last time" are signs of a crisis in the psychological protective mechanism. Protective mechanisms can stabilize personality, while at the same time they prevent serious progress in treatment. References 16: (Russian).  
[476-12131]

UDC 340.64:572.71/.76

# DETERMINING SEX OF A PERSON THROUGH CRANIOSCOPIC DATA

Moscow SUDEBNO-MEDITSINSKAYA EKSEPRITIZA in Russian No 3, Jul-Sep 83  
(manuscript received 19 Nov 82) pp 15-17

ZVYAGIN, V. N., Scientific Research Institute of Forensic Medicine (director-A. P. Gromov, corresponding member, USSR Academy of Medical Sciences), USSR Ministry of Health, Moscow

[Abstract] A method of determining the sex of a person on the basis of 40 cranioscopic characteristics is described and results of tests of its use on craniological collections of Moscow medicolegal institutions are presented.

Use of the method provided accurate identification of the sex of a person on the basis of application of the 40 characteristics in 93.53 percent of the cases while these indicators could not be used to identify the other 6.47 percent. It is not necessary to know the race of the cranium being studied nor is it necessary to restore missing parts of the skull. References 11: 6 Russian, 5 Western.  
[450-2791]

## MICROBIOLOGY

### GENETICALLY ENGINEERED BACTERIA FOR DECONTAMINATION OF OIL SPILLS

Riga SOVETSKAYA LATVIYA in Russian 18 Jan 84 p 2(17)

[Article based on interview with Mart Saarma, sector chief of the Institute of Chemical and Biological Physics of the Estonian SSR Academy of Sciences by A. Valentinov, correspondent of "Novosti" news agency: "Amazing Bacteria in Scientific Laboratories". Date and place not specified. Passages in uppercase appear in boldface in original source]

[Text] DAMAGE TO THE NATURAL ENVIRONMENT, CAUSED DURING ACCIDENTS OF TANKERS, TRANSPORTING OIL, APPEARS TO PROMOTE THE DECREASE OF MICROSCOPIC LIVING BEINGS. IT IS PRECISELY WITH BACTERIA THAT ARE CAPABLE OF PROCESSING THE MOST "INEDIBLE" SUBSTANCES, THAT SCIENTISTS OF THE INSTITUTE OF CHEMICAL AND BIOLOGICAL PHYSICS OF THE ESTONIAN SSR ACADEMY OF SCIENCES LINK THE SUCCESS OF FIGHTING THE POLLUTION OF OUR PLANET. THE CORRESPONDENT OF "NOVOSTI" NEWS AGENCY DISCUSSED THIS SUBJECT WITH THE SECTOR CHIEF OF THE INSTITUTE, MART SAARMA, CANDIDATE OF BIOLOGICAL SCIENCES.

"The problem of decontaminating oil in water basins arises not only with accidents, but at the time of loading and unloading tankers as well," says Mart Saarma. "No matter how hard the dockers try, some amount of oil always spills into the sea. Moreover, the same problem often arises on land--let's say in chemical plants, dealing with phenol compounds. Harmful substances seep into the soil, rivers and various water basins. And, everywhere the neutralization or removal of these harmful substances requires great efforts and expenditures. But, unfortunately, the results do not justify these costs. I hope that with time the problem will lose some of its acuteness: reliable "workers" will tackle the job. Just watch them!..."

After adjusting the tube of the microscope, I clearly see in a white circle tiny beings, busily scurrying under the specimen glass. However, I do not notice anything special about them.

"But, these bacteria display at least two unique properties," Saarma explains. "First of all, people, not nature, created them. We designed them by gene engineering methods, operating with the holy of holies of living nature--desoxyribonucleic acid (DNA)."

"WHAT IS ITS SECOND SPECIAL CHARACTERISTIC?"

"They feel perfectly fine in a medium which seemingly is unsuitable for life. For example, they live in oil and phenol and feed on it, cleaning up the environment. Nature did not provide for such 'sanitarians'."

"By the way, let us point out that the various mechanical traps, recently invented, for oil, phenol and other harmful substances do not completely solve the problem. No matter how effective they may be, there is some part of the chemical poison that gets into the environment. It cannot be otherwise: the efficiency coefficient of any mechanical system is always less than 100 percent. For this reason, the task we set for ourselves is to help nature by natural means: create bacteria, capable of processing the most "inedible" wastes. And, beyond this we want to understand how the hereditary system of a cell works, and use this for the national economy."

"The staff members of our Institute are realizing this program together with associates of Tartu University in one of their laboratories. Here, DNA was separated from selected bacteria, in whose "cells" genes are found that develop this or that protein essential to the organism. Then, the act of creation starts in the test tubes. The immutability of a species--those characters which one generation passes on to the other--is dependent on the permanent arrangement of genes in the DNA. If only two genes change places, then the following generations will already be different, they will acquire some kind of new properties. This is what the scientists used to their advantage. They not only changed the places of the genes, but they transplanted them from one species of bacteria to others. In the first stage the task was to teach the bacteria not only to exist in a toxic medium, but to feed on it. However, no single organism, even the most simple, is capable of taking in a poison without impunity. So, the bacteria were "altered" in such a way that they could decompose oil and phenol into the simplest non-toxic substances and ingest them only after this."

"THEN LATER, WHEN THE BACTERIA DO THEIR JOB--FOR EXAMPLE, NEUTRALIZE PHENOL WASTES FROM COKE-CHEMICAL ENTERPRISES--AND MULTIPLY IN GREAT NUMBERS, WHAT WILL THEY FEED ON? WON'T IT TURN OUT THAT, NOT FINDING SUITABLE FOOD, THEY WILL START EATING, LET US SAY, THE MICROELEMENTS ESSENTIAL TO PLANTS?"

"No, this matter will not go so far. Because, before this the bacteria themselves will become...food for domestic livestock."

"This is the main purpose of fighting for a clean environment with natural means and using the hereditary system of a live cell for the needs of the national economy. Wastes do not exist in nature. And, guided by this principle, it was decided in the laboratory to create such bacteria, which, feeding on the disintegrated products of harmful industrial wastes, would be transformed into feed protein for livestock. It is difficult to overestimate the practical importance of this work for animal husbandry. In fact, the total mass of bacteria surpasses the mass of humans and animals."

...One can imagine how difficult and painstaking this work was. The "manipulation" of even one gene requires not days, not weeks...but, months! Gene after



gene was taken from one bacterium and transplanted into another. Then, the genes of the progeny--children, grandchildren, great grandchildren and great-great-great-- were changed. And, here is the result--under the microscope in a drop of toxic phenol, where, until recently, it was considered that nothing can exist normally, the bacteria busily scurry about.

12525

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UDC 577.150.6:582.287.2

GROWTH AND OXIDATIVE ENZYME FORMATION BY WOOD-DEGRADING CORIOLUS FUNGI

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 17, No 2, 1983  
(manuscript received 16 Feb 82) pp 127-131

GAVRILOVA, V. P. and GRIGOR'YEVA, N. K., Botanical Institute imeni V. L. Komarov, USSR Academy of Sciences, Leningrad

[Abstract] A comparative analysis was made of the oxidative enzymes (peroxidase, PO; laccase, LC; polyphenol oxidase; PPO) of the wood-degrading fungi *Coriolus versicolor* 083 and *C. versicolor* 092, and *C. zonatus* 093. Evaluation of enzyme activity in relation to the growth curve showed that in all three species maximum activity of extra-cellular PO was measured between the 9th and the 11th day of growth, of LC in 17-18 day period, and of PPO after 22nd day of growth. Maximum activities, therefore, were detected at the end of the stationary phase or at the beginning of the death phase. Maximum intracellular PO activity was seen on day 11 in *C. versicolor* 092, and on day 14 in *C. zonatus* and *C. versicolor* 083, while maximum intracellular LC activity was measured on ca. day 10 in the *versicolor* sps. and on day 14 in *C. zonatus*. Intracellular PPO showed a low peak on ca. days 10-12 in the case of *C. versicolor* 092, and two peaks in *C. versicolor* 083 and *C. zonatus* on days 8-10 and ca. 16. Despite certain superficial similarities in the activities of oxidative enzymes among the different species and strains in relation to the growth curve, these observations also point to rather significant physiological differences. Figures 4; references 11: 1 Polish, 5 Russian, 5 Western. [431-12172]

UDC 582.28:581.198:58.095

PROTEIN SYNTHESIS BY MOLDS IN SUBMERGED CULTURES ON COMPLEX MEDIA

Leningrad MIKOLOGIYA I FITOPATOLOGIYA in Russian Vol 17, No 2, 1983  
(manuscript received 7 Jun 82) pp 135-139

STAKHEYEV, I. V., BABITSKAYA, V. G., KOSTINA, A. M. and VADETSKIY, B. Yu., Institute of Microbiology, Belorussian SSR Academy of Sciences, Minsk

[Abstract] Tests were conducted on the suitability of potato extracts as media or supplements for submerged culture of various molds. Screening trials demonstrated that highest biomass and protein producers on such media were

*Penicillium piscarium*, *P. simplicissimum*, *Aspergillus niger*, *Chaetomium cellulolyticum* and *Diplodia citricola*. Maximum growth occurred at temperatures of 26-30°C with biomass yields of 12-14 g/liter on the extract and 19-22 g/liter on the pulp, with 'true' protein content ranging from 38 to 52%. Chemical evaluation of the proteins formed by the molds under these conditions showed that their biological value ranged from 77 to 80% and, therefore, was close to the value of soybean protein. None of the molds in question produced antibiotics active against bacterial test cultures, and preliminary animals studies showed that the mold cultures themselves and their biomass products were nontoxic. Figures 2; references 8: 7 Russian, 1 Western.  
[431-12172]

## MILITARY MEDICINE

UDC 624.1:617-001.45-079.61

### CLOSE GUNSHOT DAMAGE FROM DRAGUNOV SNIPER RIFLE

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 1, Jan-Mar 84  
(manuscript received 15 Jun 83) pp 25-26

CHUPIKOV, A. S.

[Abstract] An analysis was made of the type of damage inflicted on coarse and fine cotton fabric by gunshots from the Dragunov sniper rifle, when fired from distances ranging from one to thirty centimeters. Analysis of 180 discharges demonstrated that tearing of the fine fabric occurs when the rifle is fired from a distance of 13 cm or closer, and of the tick fabric from 4 cm or closer. In addition, when fired from a distance of 9 cm or closer the perforation is surrounded by a rather unique powder burn in the form a five-pointed star. Figures 2.

[449-12172]

UDC 613.68

### PREVENTIVE MARINE MEDICINE

Moscow SOVETSKOYE ZDRAVOOKHRANENIYE in Russian No 3, Mar 84  
(manuscript received 1 Nov 83) pp 17-20

YEVSTAF'YEV, V. N. and NETUDYKHATKA, O. Yu., Odessa Branch, Scientific Research Institute of Water Transport, USSR Ministry of Health

[Abstract] An analysis was conducted on the state of health in the Soviet merchant marine and the morbidity patterns, with specific statistical examples taken from the Black Sea fleet. Basically, approximately 85.4% of the personnel meet the criteria of good health, with the figure ranging from 97.0% for those in the 18-19 year age bracket to 66.5% for sailors older than 50 years. The study resulted in several key recommendations for health maintenance and improvement aboard ship. These recommendations included a call for improved working conditions and more stringent health legislation, better organized and more frequent rest and recreation breaks, establishment of mental health services aboard ship and psychological testing for occupational suitability, and institution of medical screening programs. References 4: (Russian).  
[520-12172]

UDC 616.155.35:613.163

CHARACTERISTICS OF EOSINOPHILIC REACTION IN A BLOOD SYSTEM DUE TO  
SUPERHIGH FREQUENCY ELECTROMAGNETIC RADIATION

Kiev VRACHEBNOYE DELO in Russian No 2, Feb 84 (manuscript received 5 May  
83) pp 106-108

[Article by Ye. I. Obukhan, Laboratory for Biological and Hygienic Research  
(Chief-Director of Medical Sciences M. I. Rudnev), Kiev Scientific Research  
Institute for General and Communal Hygiene imeni A. N. Marzeyev]

[Text] The study of eosinophilic reaction changes under the influence of factors of a different nature on the organism is important, inasmuch as its intensity reflects in some measure the condition of the defensive strengths of the organism and can be one of the diagnostic symptoms of allergic conditions, infectious diseases, tumors, etc. Authors of a number of studies report the fact that eosinophilia has been identified in blood analyzed from people who service SHF generators (Barron et al., 1956; Khadukh et al., 1960; F. A. Gromov, 1966; M. P. Troyanskiy et al, 1967). In a long-term experiment on animals, an eosinopenic blood reaction was determined under the influence of millimeter waves on mice (N. P. Zalyubovskaya, 1977) and a small increase in the number of eosinophils in guinea pigs under the influence of centimeter waves (S. A. Kartsovnik, 1977). With a single exposure, immediately following irradiation and after a short time had elapsed (Mikhayel'son, 1961; S. F. Gorodetskaya, 1964; A. V. Kirillov, 1972) and also under the conditions of two weeks' exposure, (V. A. Pokhov, 1970), a transition from eosinopenia to eosinophilia was registered. The reason for the variations observed was not established. Moreover, it turned out that an unstable increase in the amount of eosinophilic granulocytes in the bone marrow in the case of a short-term effect of nonionizing radiation of thermal intensity was not reflected in the blood condition (Khayd, 1968).

Considering the great significance of eosinophils in the defense reactions of the organism and the absence of literature data concerning the nature of the development of eosinophilic (eosinopenic) reaction due to microwave radiation, we set about the task of identifying characteristics of the morphogenesis of bone marrow eosinophilic granulocytes on the background of quantitative changes in them in the peripheral blood under various SHF-radiation conditions.

The research was conducted on white mongrel and Wistar rats, weighing

200-250 g. The animals were irradiated in groups using a LUCH-58 magnetron generator, frequency 2375 MHz, using energy flux densities (EFD's) of 10, 50, and 500 mcW/cm<sup>2</sup> under daily 7-hour exposure for a month and 50 mcW/cm<sup>2</sup> in conditions of one-time radiation for a half hour and an hour. The control group was kept under the same conditions, without irradiation. In the Wistar rats, bone marrow and peripheral blood were analyzed after 12 hours and 7 and 16 days after single exposure (EFD 500 McW/cm<sup>2</sup> 7 hours) and in the mongrel rats under the dynamics of monthly effect (EFD 10, 50 and 500 McW/cm<sup>2</sup>) with samples taken in the first half of the day, either right away or 12 hours after 1-, 2-, 7-, 10-, 14-, or 30-time exposure. Animals irradiated at an EFD of 50 mcW/cm<sup>2</sup>, were tested immediately after irradiation and also after 1, 2 and 10 days. The bone marrow from tibial bones and peripheral blood from body and tail veins was studied in smears stained according to Pappenheim. Myelograms were made up at a count of 1000, hemograms of 200 nucleus-containing cells. A mitotic index was calculated with a count of 100-200 eosinophils capable of division. All experiments were done in 4-7 repetitions, using a dynamic control. Statistical processing of the data obtained in counting the total number of eosinophils in the homograms and myelograms was done according to Fisher and Student. At the same time a count was done of all stages of their differentiation.

The percent content of eosinophilic granulocytes in rat bone marrow in the dynamics of monthly SHF-effect with an EFD of 10 mcW/cm<sup>2</sup> differs from the control in phasic shifts of its maximal and minimal significance at each experimental point, which could be the result of disturbing the daily rhythm of eosinophil differentiation under the effect of radiation. The variability in the number of eosinophils is due to the myelocytic and metamyelocytic reactions characteristic for all intensities of radiation. No reliable differences were noted with the control.

In the case of exposure to an SHF field, EFD 10 mcW/cm<sup>2</sup>, the total number of eosinophilic granulocytes in the myelograms at all stages of the investigation surpassed the level of the control. After a 14-day exposure, myelocyte and metamyelocyte hyperplasia intensified, reaching reliable differences after 30 days (according to Fisher and Student  $P < 0.001$ ). Blood indices, as in the first case, varied within the limits of the reaction norm with a tendency to insignificant eosinophilia after the first radiation sessions.

One-time radiation (EFD 500 mcW/cm<sup>2</sup>) stimulated the development of bone marrow eosinophils in the process of exposure and for 12 hours after exposure (according to Fisher  $P < 0.001$ , according to Student  $P < 0.01$ ). After 7 days or more the number of eosinophilic granulocytes returned to normal. With 7-time exposure eosinopenia ( $P < 0.05$ ) was observed; temporary eosinophilia was observed after a 10-time exposure as well as further normalization of the eosinophilic reaction by the end of the monthly experiment. A statistically unreliable increase in the number of eosinophils was registered in the hemogram in the first 7-10 days of radiation and a reduction in subsequent stages.

Immediately following one-time exposure to an SHF field, EFD 50 mcW/cm<sup>2</sup>, the eosinophilic granulocyte level in the bone marrow reached the lower

limit of the reaction norm in most cases; 1, 2, and 10 days after irradiation (exposure of 1 hour) myelocyte and metamyelocyte hyperplasia was observed. The peripheral blood was characterized by unstable indices with a tendency toward eosinophilia due to the appearance of myelocytes and metamyelocytes in the blood.

Along with the changes in quantity, an increase in the proliferative activity of the eosinophilic myelocytes occurred. In untreated rats the mitotic index per 100 or 200 cells was equal to 0, and in rare cases<sub>1</sub>. Proliferation activation was observed at an EFD of 50 and 500 mcW/cm<sup>2</sup>. Within the dynamics of the monthly experiment, the intensity of reproduction most frequently corresponded to quantitative shifts in the eosinophil level; however an increase in the number of mitoses was recorded for certain rats and against a background of a reduction in their number. Under the effect of an SHF-field of thermal intensity the mitotic index increased sometimes to 2-3, 1 and 2 days after irradiation.

The data obtained reflect differences in reactivity and the development of eosinophilic granulocytes during exposure to an SHF-field of nonthermal and thermal intensity. Insignificant blood eosinophilia after the first radiation sessions (all levels) is apparently due to an increase in the defensive strengths of the organism and occurs through intensified production of them in the bone marrow, which shifts in the process of the further effect of the rhythm of eosinophil morphogenesis as a result of phasic changes in a ratio of maximal and minimal significance of their number<sub>2</sub> (EFD 10mcW/cm<sup>2</sup>) and activates myelopoietic hyperplasia (EFD 50 mcW/cm<sup>2</sup>) relative to the control.

On the basis of the data obtained it is difficult to explain the more rapid normalization of the number of eosinophils in the bone marrow and blood at an EFD of 500 mcW/cm<sup>2</sup> than at an EFD of 10 and 50 mcW/cm<sup>2</sup>. It can be assumed that at this intensity, due to more profound shifts in the processes of eosinophil differentiation, the activity of eosinophilic granulocytes deposited in the spleen and the lungs increases. Research results obtained during one-time irradiation of animals with an SHF-field of thermal intensity indicate some disorganization in the production of eosinophils, in contrast to nonthermal intensities in which the requirement of the organism for them is regulated mainly by the intensity of morphogenesis.

Thus the eosinophilic granulocyte level in peripheral blood and bone marrow under the effect of an SHF-field of varying intensity is a labile and dynamic index, varying as a function of the level, number of sessions and time of irradiation, and also of the time elapsed after the factor effect and caused mainly by intensity and rhythms of differentiation and their products at the morphogenesis stage. The number of eosinophils in the blood in cases of irradiation changes to a lesser degree than in the bone marrow which, apparently is due to regulation of their production and redistribution reactions between various tissue depots and the blood course.

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DOPPLER SONOGRAPHIC FOLLOW-UP OF CEREBRAL STROKE PATIENTS TREATED WITH  
DECIMETRIC WAVES

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII in Russian Vol 84, No 1, Jan 84  
(manuscript received 25 May 83) pp 43-47

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[Abstract] Doppler sonography was used to follow sequelae of decimeter wave treatment of 55 patients who had sustained a cerebral insult. The male and female patients ranged in age from 20 to over 70 years in age and were treated during the recovery phase with treatment directed at the affected site from a Volna-2 generator (20-30 W power output at 3-5 cm from the head, 15 min/day for 10-12 days). Doppler sonography provided objective demonstration of the effectiveness of electromagnetic wave treatment applied within a year of stroke or later. In most of the patients asymmetry in local blood flow diminished in the common carotid and orbital arteries, and collateral circulation developed from the external carotids. In addition to the sonographic indications of circulatory improvement, improvement was also noted in the neurological signs. Doppler sonography was thus shown to be an effective diagnostic modality in following the status of cerebral circulation of patients treated with electromagnetic waves. Figures 2; references 7: (Russian). [474-12172]

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EFFECTS OF DECIMETER WAVE THERAPY ON EARLY POSTSURGICAL CEREBRAL HEMODYNAMICS  
FOLLOWING CEREBRAL REVASCULARIZATION

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII in Russian Vol 84, No 1, Jan 84  
(manuscript received 28 Apr 83) pp 50-55

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[Abstract] Rheoencephalography was used to follow the course of 43 patients subjected to decimeter wave therapy after cerebral revascularization. The male



and female patients, ranging in age from 18 to 60 years, were treated with decimeter waves projected at the cervical area from a Volnz-2 generator with a power output of 20-40 W. The entire course of treatment consisted of 15 min daily sessions for 10 to 12 days in the immediate postoperative period. Electromagnetic wave therapy was seen to enhance circulatory adaptive mechanisms and improve cerebral hemodynamics. The objective improvements consisted of a decrease in hemispheric circulatory asymmetry, decreased vascular tone and increased blood flow in the affected areas. The objective changes were accompanied by neurological improvement, which provides further confirmation for the efficacy of decimeter waves in the management of such cases. Figures 1; references 4: (Russian).  
[474-12172]

UDC 340.627:615.285.7:547.241].099.07:616-008.931-079.6

HISTOCHEMICAL AND METABOLIC CHANGES IN INTERNAL ORGANS FOLLOWING INTOXICATION  
WITH ORGANOPHOSPHORUS COMPOUNDS

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 1, Jan-Mar 84  
(manuscript received 2 Nov 82) pp 29-31

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[Abstract] Histochemical studies were conducted on tissue samples obtained from 120 human cases of lethal intoxication with organophosphorus chemicals (chlorophos, carbophos), supplemented by experimental studies on rats poisoned with chlorophos. In both the human and experimental cases histochemical analysis of the enzyme patterns in the brain, liver, heart and kidneys revealed similar alterations pointing to altered redox states in the tissues, while histologic examination demonstrated extensive dystrophic changes, and necrosis with the presence of many lipofuscin granules in the cardiomyocytes, hepatocytes and the hypothalamus. Therapeutic measures generally tended to normalize the histologic and histochemical findings to some extent, but were without telling effect on the clinical course of the intoxication. In general, treatment with laziks and dipiroksim [sic] improved the transport characteristics of endothelial cells and enhanced the functional patency of the blood-brain barrier. However, blood levels of acetylcholine- and butyrylcholine esterases remained subnormal. Figures 2; references 6: (Russian).  
[449-12172]

UDC 616.895.87-07:616.831-073.97

SYSTEMATIC EEG PATTERNS IN DIAGNOSIS OF PSYCHOPATHOLOGY

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII in Russian Vol 83, No 12, Dec 83  
(manuscript received 14 Dec 82) pp 1805-1811

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[Abstract] Background EEG patterns of paranoid schizophrenics were compared with patterns prevalent in normal control subjects, as well as with the changes

induced by the administration of aminazine (200 mg) or Leponex (100 mg). In general terms, the spatial organization of EEG can be described by two types of changes: generalized changes that are similar for all regions of the cortex, and changes that show zonal differentiation with a fronto-occipital change in gradient. Alterations in the EEG recordings are predicated on the functional status of deep structures, which are altered in schizophrenia and under the influence of neuroleptic agents. As a result, analysis of pattern changes induced by the drugs can be used for predicting the relative therapeutic effectiveness of such agents. Figures 2; references 31: 26 Russian, 5 Western. [475-12172]

UDC 612.822.3

#### EFFECT OF ATROPINE AND COBROTOXIN ON DENDRITIC POTENTIALS OF RAT'S CEREBRAL CORTEX

Tbilisi SOOBASHCHENIYA AKADEMII NAUK GRUZINSKOY SSR in Russian Vol 112, No 2, Nov 83 (manuscript received 14 Oct 82) pp 393-395

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[Abstract] In an attempt to explain the participation of cholinergic mechanisms in the origin of stimulatory postsynaptic potentials of axodendritic cortex synapses, the so-called dendritic potentials (DP), experiments were performed on adult non-anesthetized rats immobilized with ditilin. Atropine--selective blocking agent of M-cholinoreceptors--was used in 0.1-0.5% dose range; cobrotoxin--a non-reversible blocking agent for cholinoreceptors--was used in 30  $\mu$ M dose. In low concentrations (0.1%) atropine increased the amplitude of DP which after a while returned to normal. Atropine at the 0.5% dose and cobrotoxin caused a depression of DP. These results supported data obtained in earlier studies on anesthetized cats. Figures 3; references 7: 5 Russian, 2 Western. [499-7813]

#### BIOLOGICAL PROPERTIES OF VIBRIO CHOLERAЕ NON-01 ENTEROTOXIN

Prague ZHURNAL GIGIYENY EPIDEMIOLOGII MIKROBIOLOGII I IMMUNOLOGII in Russian Vol 27, No 2, Apr-Jun 83 (manuscript received 5 May 82) pp 193-199

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[Abstract] Enterotoxin derived from *Vibrio cholerae* non-01 yielded three precipitation lines with specific rabbit antiserum in the Ouchterlony diffusion test, shown by electrophoretic analysis to be due to protein components of the toxin. Preincubation with the antiserum also abolished enterotoxin-induced

cutaneous capillary permeability and petechiae in rabbits. In addition, a similar degree of neutralization was obtained by preincubation with antiserum induced by the cholera toxin. However, the cross-reaction was incomplete since the anti-enterotoxin serum did not neutralize cholera toxin. Biological activity of the enterotoxin was not affected by heating at 56°C for 30 min, but the enterotoxin was completely inactivated by heating at 100°C for 10 min. Both the V. cholerae non-01 enterotoxin and culture filtrate increased the level of cAMP in rabbit intestinal cells and both also induced the cytopathologic changes in Vero cell tissue culture. These observations confirm previously reported distinctions between the properties of V. cholerae cholera toxin and enterotoxin, and implicate the latter in the pathogenesis of cholera. Figures 2; references 15: 3 Czech, 12 Western.  
[471-12172]

UDC 577.153

#### EFFECT ON $\text{Na}^+$ , $\text{K}^+$ -ATPase ACTIVITY OF BRAIN OF RATS POISONED BY ORGANOPHOSPHORIC ACETYLCHOLINESTERASE INHIBITOR

Yerevan NEYROKHIMIYA in Russian Vol 2, No 3, Jul-Sep 83 (manuscript received 2 Mar 82) pp 256-262

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[Abstract] Change of  $\text{Na}^+$ ,  $\text{K}^+$ -ATPase activity in rat brain after the rats were poisoned by organophosphorus inhibitor Gd-7  $[(\text{CH}_3)(\text{C}_2\text{H}_5\text{O})\text{P}(\text{O})\text{CH}_2\text{CH}_2\text{SC}_2\text{H}_5]$  in a dose causing grave but not fatal poisoning was traced. White male rats (weight 180-250 g) received intramuscular injections of Gd-7, diluted in physiological solution; were decapitated 2.5, 24 or 48 hours later and mixed (arterial and venous) blood and brain were studied. Maximum tolerable dose is 0.5  $\mu\text{mole/kg}$  of rat weight. First signs of intoxication were restlessness of the rats and severe bronchospasm, followed by muscle fibrillation and paresis of extremities. Within 2 to 2.5 hours, signs of intoxication abated; rats began to move about 1 hour after poisoning and their behavior resembled that of control rats one day later. Gd-7 in a 0.5  $\mu\text{mole/kg}$  of rat weight dose inhibited blood cholinesterase activity by 95 percent and brain acetylcholinesterase activity by about 85 percent with 2.5 hours after administration. Brain acetylcholinesterase activity and blood cholinesterase activity was restored in the first 2 days after poisoning. After Gd-7 injection,  $\text{Na}^+$ ,  $\text{K}^+$ -ATPase activity in the total mitochondrial and microsomal fractions of the cerebral hemisphere increased within 2.5 hours.  $\text{Na}^+$ ,  $\text{K}^+$ -ATPase activity in the mitochondrial fraction was increased for the 2 following days with a peak at 24 hours. Changes in  $\text{Na}^+$ ,  $\text{K}^+$ -ATPase activity were noted only if the brain fractions were processed by sodium desoxycholate. References 22: 11 Russian, 11 Western.  
[445-2791]

UDC 547.96.07

EFFECT OF DELTA-SLEEP INDUCING PEPTIDE AND ITS ANALOGS ON RABBIT BRAIN  
BIOELECTRICAL ACTIVITY

Yerevan NEYROKHIMIYA in Russian Vol 2, No 3, Jul-Sep 83 (manuscript received  
19 Feb 82) pp 272-279

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[Abstract] Effect of delta-sleep inducing peptide and its analogs on the  
electroencephalogram (EEG) of rabbits after intraventricular injection of  
various doses under normal conditions and during deprivation of sleep caused  
by stress is described and discussed. EEG was registered before and after  
injecting the preparation in 144 experiments on 48 chinchilla rabbits (weight  
1.8±0.3 kg) of both sexes. It was found that doses ranging from 20-150 µg/kg  
of animal body weight cause an increase of pronouncement of delta-waves in  
the overall EEG. Some animals showed individual sensitivity to the peptide.  
Analogues cyclo-(Gly-DSIP), Asn<sup>3</sup>-DSIP and D-Ala<sup>3</sup>-DSIP produced the most  
pronounced effect of those studied. Action of delta-sleep inducing peptide  
is greater in rabbits deprived of sleep. Figure 1; references 20: 8 Russian,  
12 Western.  
[445-2791]

UDC 612.8.015

EFFECT OF ENDOGENOUS OLIGOPEPTIDE LIGANDS OF GROUP S-100 NEUROSPECIFIC PROTEINS  
ON BEHAVIOR

Yerevan NEYROKHIMIYA in Russian Vol 2, No 3, Jul-Sep 83 (manuscript received  
18 May 82) pp 319-322

SHERSTNEV, V. V., KOCHETKOV, N. V., BELYAYEV, S. V., LYSOVA, N. P., DOLGOV,  
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[Abstract] Behavioral influence of endogenous oligopeptides, interacting with  
group S-100 neurospecific proteins was described and discussed. Fractions of  
anionic and cationic oligopeptides were injected into the left ventricle of

150-200 g mongrel rats which, after 12 and 36 hours and 14 days after a single injection were placed in chamber 1 to test their orientation-investigative activity and in chamber 2 to elaborate a conditioned reflex avoidance reaction and test its duration. The studies showed that the group S-100 immobilized proteins interact biospecifically with some unidentified oligopeptide ligands which were assumed to be species nonspecific. Changes in rat behavior after one injection of the S-100 oligopeptide ligands lasted at least 2 weeks. These oligopeptides did not affect the motor and orientational investigative activity of the animals but modified the emotionally tinged avoidance behavior, caused by pain stimuli. The results obtained suggest the promise of search for new "behaviorally" active oligopeptides on the basis of their capacity to interact biospecifically with certain neurospecific proteins. Figures 2; references 9: 4 Russian, 5 Western.  
[445-2791]

UDC 612.82.821.2

#### PEPTIDES, LEARNING AND MEMORY (PRINCIPLE OF POLYFUNCTIONALITY)

Yerevan NEYROKHIMIYA in Russian Vol 2, No 3, Jul-Sep 83 (manuscript received 26 Jan 83) pp 327-341

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[Abstract] A review of the literature concerning biological effects of neuropeptides justifies the assumption that one and the same function regulates several peptides and the same peptide may participate in regulation of several functions. Neuropeptides produce a pronounced effect on memory processes in doses much less than those that produce other biological effects and this effect is not associated with their hormonal effect on memory and learning processes. Effect of neuropeptides on learning and memory processes depends on the species and individual features of animals used and on the dosage and method of administering the neuropeptide. The principle of polyfunctionality as shown in processes of learning and memory such as formation, fixation and reproduction of temporary connections and the role of different neuropeptides in regulating the same aspect of memory function are described and discussed. Figures 2; references 70: 16 Russian, 54 Western.  
[445-2791]

UDC: 617.7:614.2(581)

EYE PATHOLOGY IN DEMOCRATIC REPUBLIC OF AFGHANISTAN AND PLANS FOR DEVELOPMENT OF OPHTHALMOLOGICAL CARE

Odessa OFTAL'MOLOGICHESKIY ZHURNAL in Russian No 8, 1983 (manuscript received 15 July 83) pp 492-494

[Article by Doctor Mukhammad Khassan Sherzay, Kabul]

[Text] The people's revolutionary government of the Democratic Republic of Afghanistan headed by Babrak Karmal' devotes much attention to public health issues. One of its main programs is the program for organizing state care for the people of DRA.

Implementation of this program has significantly improved national health care. Thus, at the present time there are 61 hospitals, 4043 beds, 158 health centers, 665 physicians, 1051 nurses, 1918 pharmacists, 167 laboratory technicians and 11 blood banks in this country. In spite of the achievements made, it can still not be maintained that all problems of health care in the nation have been completely solved. In particular, there is the pressing issue of organizing the ophthalmological service.

At the present time, ophthalmological care is being administered to the people of the Democratic Republic of Afghanistan by a special organization, NOOR (National Organization of Ophthalmological Rehabilitation), which is located in Kabul. The NOOR Eye Institute must develop and upgrade ophthalmological services to the people of Afghanistan; it works in close contact with the Afghan Ministry of Health. The institute has 120 beds with 26 ophthalmologists working in it, 3 of whom are foreigners. In addition, there is a 20-bed eye hospital in Herat and 10-bed one in Dzhalal-Abad. The foregoing indicates that most of the population of DRA is still not receiving eye care.

There is virtually no information about the incidence of eye pathology in Afghanistan, which makes the work of the organization of ophthalmological service and rendering care to the public quite difficult.

The few data in the literature--Buck (1968), Peirot (1952), Baum (1949) and others--indicate that trachoma (58.9 to 70.2%) is the chief cause of diminished vision in Afghanistan among the patients examined. Cataract, glaucoma, congenital eye diseases and trauma are less widespread (Buck, 1972). Thus, the incidence of eye pathology in DRA has not been sufficiently investigated. We do not know the nature of eye diseases among the urban and rural population,

the incidence of eye diseases in the country's provinces that differ in climate and economic conditions, etc.

In order to investigate these matters, it was necessary, first of all, to elaborate organizational forms and methods of screening the public for eye disease, then find the means of organizing the ophthalmological service in the country.

Considering the fact that there are still few good roads in Afghanistan, many provinces are far from the capital and in view of the low standard of living, one should select forms of ophthalmological screening that would permit coverage of the rural population as well, and would enable all those who need it to come to an eye doctor.

We proposed for the first time in the Democratic Republic of Afghanistan a new organizational form of screening the rural population consisting of mobile eye camps. The personnel of such a visiting camp was defined: two ophthalmologists, four nurses, two orderlies, one cook and one camp chief.

The following were notified before the eye camp departed on a trip: governor of the province, director of central hospital, directors of schools and other medical institutions. The brigade arrival dates were coordinated and the public was notified. Patients were seen at a scheduled time and in a place prepared in advance. Ambulatory screening was performed in the mornings and any necessary surgical interventions in the afternoons. Patients who required more qualified eye care were referred to Kabul, to the NOOR Eye Institute.

In 1980-1981, we organized 4 such camps and traveled to 4 provinces: Farah, Faizabad, Maimana and Bamian at different distances from Kabul, from 201 to 901 km, with no good roads connecting them to the capital.

The medical workers of the mobile camp examined a total of 4867 patients. It should be noted that successful treatment for many patients, to whom medical care could be administered immediately, was instrumental in popularizing the work of ophthalmologists and stimulated the public to visit the specialists.

For a more thorough study of the distribution of eye pathology in Afghanistan, we analyzed the case histories of ambulatory patients who had visited the Eye Institute in 1975-1977 and 1979-1981. In all we analyzed 138,325 case histories. Thus, for the 1975-1977 period, 44,054 people with eye disease came to the Eye Institute and in 1979-1981 94,271 did so, i.e., 2.15 times more. This is due, first of all, to the fact that the people's revolutionary government of the Democratic Republic of Afghanistan administered free treatment to most of the country's population, while organization of medical propaganda--lectures, talks over radio, in schools and institutions--instilled public confidence in the state medical service. The struggle against virtually total illiteracy in the country, increase in number of schools and preventive examination of children in some schools in Kabul were also instrumental in increasing visits made by people with eye diseases to seek attention.



Statistical analysis of the obtained data revealed that trachoma is still the most widespread eye disease in Afghanistan. Thus, 3947 patients presenting different stages of trachoma came to the Eye Institute in 1975-1977. Of this number, 3053 (77.3%) were referable to the first stage, 493 second stage and 401 third stage. And in the 1979-1981 period, there were already 10,578 cases: 8610 (81.4%) with first stage, 1003 second and 965 third. There were 6064 males and 4514 females.

Patients with conjunctival pathology were in second place in seeking attention at the Eye Institute. Thus, there were 18,089 such cases (41.1% of all those coming to the institute) in the prerevolutionary period (1975-1977) and the number increased to 37,027 (39.3%) in the postrevolutionary years (1979-1981). We relate the increase in number of patients with conjunctival disease who came to the institute to development of medical propaganda and cost-free care.

Patients with corneal disease made frequent visits to an eye doctor in 1975-1977 (3642 visits, 8.3%), but the number of visits increased to 12,682 (13.5%) in 1979-1981. Corneal ulcers were found most often among patients with corneal pathology in both the prerevolutionary and postrevolutionary period--1193 (9.4% of all visits made for eye pathology). Lenticular diseases were found in 12% of the patients in 1975-1977 and 8.9% in 1979-1981. Impaired refraction was found in 5777 (13.1%) of those seeking attention in 1975-1977 and 15,467 (16.4%) in 1979-1981. Typically enough, patients with strabismus very seldom visited physicians before the revolution (409 people--0.9%). In postrevolutionary years there were already 1373 people (1.5%) with strabismus who sought medical attention. This fact is indicative not only of growth in the public's confidence in medicine, but expansion of opportunities for treatment because of its being free, rise in general welfare of the public and desire to be attractive, for strabismus is not only a disease, but a cosmetic defect.

In 1975-1977 1205 people (2.7%) sought attention for glaucoma and in 1979-1981 glaucoma was recorded at the Eye Institute in 2706 patients (2.9%). Unfortunately, most of these patients had diminished vision or total blindness due to absolute glaucoma: 1103 (41.1% of all glaucoma cases) had diminished vision and 898 were completely blind (33.2%). In all, those with visual handicaps and totally blind due to glaucoma constituted 74.3% of all the patients with glaucoma who came for medical attention. In the future, detection and treatment of patients with early stages of glaucoma should become one of the basic objectives of ophthalmological care.

Among other eye diseases, involvement of the choroidea and retina was encountered the most often in 1975-1977--3.9-3.8%; involvement of the eyelids and orbit was recorded in 4.3-4.8% and of the lacrimal system in 3.8-2.8%.

We did not include in our data the cases of eye trauma, since many of them go to military hospitals so that a record of such pathology could not be kept.

Investigation of the distribution of eye pathology in DRA put to us the task of organizing an ophthalmological service in the nation. We proposed a plan for development of ophthalmological care of the public of DRA for the next 10 years and defined its main tasks:

1. Develop a system of organizing ophthalmological care for the inhabitants of DRA.
2. Train national ophthalmological personnel on the basis of 1 ophthalmologist per 150,000 population (average of 114 specialists).
3. Develop a plan of effective measures for the control of trachoma.
4. Develop syllabuses for physicians specializing in ophthalmology and for paramedical personnel.
5. Develop a program of scientific research on eye diseases inherent in this nation.
6. Develop an orderly system of propaganda aimed at explaining to the public the opportunities for early visits to specialists in case of eye disease.
7. Establish a consultant council for the control of blindness and rehabilitation of visually handicapped.

We proposed the following structure for organizing ophthalmological care for the inhabitants of DRA.

The NOOR Eye Institute (Kabul) is the chief scientific-clinical and organizational-methodological center.

Regional ophthalmological 30-40-bed centers in the 5 major provinces of the nation (Herat, Nangahar, Kandahar, Balkh, Kunduz). Health centers, of which there are 158 in DRA, where general medical care is rendered. After training on the program we developed at the NOOR Eye Institute, the health center physicians will examine the patients in their region regularly, detect eye diseases, administer primary eye care and refer patients to the regional ophthalmological center.

It can be stated with confidence that all these steps will be instrumental in further improvement of ophthalmological care of the people in the Democratic Republic of Afghanistan.

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CSO: 1840/454

## MEDICINE TODAY

Moscow MEDITSINA SEGODNYA. NOVOYE V ZHIZNI, NAUKE, TEKHNIKE in Russian 1983  
(signed to press 29 Dec 1983) pp 2, 56-58, 59-60, 61-62

[Annotation, table of contents and excerpts from the collection compiled by A. Maslyayeva and reviewed by Doctor of Medical Sciences, Professor D.T. Tagdisi, "Medicine Today", 202,810 copies, 64 pp, Moscow, Izdatel'stvo "Znaniye"]

### [Text] Annotation

Materials from the collection are concerned with the successes which have been achieved in Soviet medicine in recent years. Special attention is directed to endocrinology, obstetrics and pediatrics. Readers will learn of the new medical tools and therapeutic agents developed both in our country and also in foreign ones which enable the restoration of health.

The brochure is intended for professors and medical workers.

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### Excerpts

#### Obstetrics and Pediatrics: Information

During the 10th Five-Year Plan, a network of pediatric polyclinics, hospitals, female consultations, and birthing homes grew. Their diagnostic and therapeutic facilities were improved. Large-scale pediatric multidisciplinary hospitals were constructed. Construction was also begun for pediatric polyclinics with pools, sports medicine and restoration therapy departments. The norms were increased for expenditures on food and medication in birthing homes and pediatric hospitals. The industrial output of nutritional products for children was increased. Training of pediatricians was expanded significantly. In addition, six pediatric faculties were organized. The organizational forms of pediatric and obstetrical-gynecologic aid were improved.

Significant attention has been directed to resolving the complex problem of protecting the health of the fetus and newborn. The number of medical-genetic consultations and "marriage and family" consultations has increased. Three All-Union centers have been created: for medical-genetic consultation under the auspices of the Institute for Medical Genetics of the USSR Academy of Medical Sciences, for diagnosis of congenital pathology in children under the auspices of the Moscow Scientific Research Institute for Pediatrics and Pediatric Surgery of the RSFSR Ministry of Health and a center for prenatal diagnosis within the structure of the All-Union Scientific Research Center for the Protection of the Health of Mother and Child. Under the auspices of the clinic for pediatric surgery of the Second Moscow Medical Institute, an All-Union center for resuscitation of newborns was organized and within the Institute of Cardiovascular Surgery of the USSR Academy of Medical Sciences, an All-Union center for surgery to correct congenital heart defects in newborns and children in the first year of life was organized. Under the auspices of clinical hospitals 10 and 13 in Moscow, departments for resuscitation and intensive care for premature infants were opened for the first time in this country.

The solution to important social-economic tasks and the improvement of medical aid has allowed significant improvement in the health of women and children. The physical development of children in all age groups in many different regions of the country has been improved. Child and maternal death rates have been lowered as well as gynecologic morbidity accompanied by temporary loss of work capacity. Definite successes have been achieved in lowering the morbidity in children from acute respiratory and intestinal infections: a decrease in the level of morbidity in children who attend preschool establishments has been noted. To a significant degree, positive shifts in the protection of the health of women and children are the result of development of medical science and the introduction of its achievements into practice. The most pressing problems in pediatrics and obstetrics are being studied in this country at 26 scientific research institutes and 525 specialized departments at medical institutes and institutes for the advanced training of physicians. Scientific councils for pediatrics, obstetrics, and gynecology, and problem solving commissions which plan and coordinate the scientific activity of these scientific collectives have been created by the presidium of the USSR Academy of Medical Sciences.

Scientific establishments have developed and introduced into practice methods for examining pregnant women and newborns to detect congenital diseases, the fundamentals of ultrasonic diagnostics for perinatal pathology, methods to monitor the fetal state and therapeutic methods for acute and chronic hypoxia of the fetus and newborn. Based on an in-depth study of neurohormonal, immunologic and biochemical mechanisms, new methods have been introduced into practice for diagnosis and treatment of various forms of female infertility, and neuroendocrinologic diseases and syndromes.

For feeding children in the first months of life, the Institute of Nutrition of the USSR Academy of Medical Sciences and its Kazakh affiliate, and scientific institutes in the Ukrainian and Kirghiz SSR have created new adapted

milk mixtures with an improved composition, most closely resembling the composition of woman's milk.

Investigations in the area of pulmonary disease have helped to more accurately define a number of questions in the pathogenesis, prophylaxis, diagnosis and treatment of broncho-pulmonary diseases in the pediatric age group. The development of an effective approach to intensive therapy for serious forms of pneumonia and acute respiratory diseases has enabled a decrease in mortality of children in the first year of life.

Principles for rational therapy for a number of infectious diseases have been introduced into practice, laboratory diagnosis has been improved, serial prophylactic vaccination has been improved, methods for life-saving immunization have been proposed, and work for the improvement and creation of new vaccines is continuing.

To a significant degree, the successes attained in the area of pediatric surgery are related to the development of anesthesiologic-resuscitatorial services in pediatrics and to the creation of services for newborn surgery.

Observations in recent years point to the unreliability of calendar growth as an index of maturity for individual organs and of the developing organism as a whole. Greater significance has been attributed to biological maturity, or biological growth, during the determination of which the systemic approach is more suitable, based on evaluation of the degree of maturity of individual organs and the physiologic system. The problems of accelerated development of the current generation occupies a special place in the study of the healthy child. The phenomenon of acceleration was evaluated positively 10-12 years ago, but at the present time, information about its negative influence on the organism has increased. Often, accelerated development does not proceed harmoniously but rather, causes marked heterochronia of essential somatotropic signs. This complicates the determination of functionally adaptive forces, the degree of biological maturity, and increases the possibilities for health disorders.

The last decade has been characterized by wide-scale introduction into practice of endoscopic methods for diagnosis, the possibilities for which have been substantially increased because of the use of deep fiberoscopes. Also the therapeutic role of fiberendoscopy in detecting hemorrhage, in eliminating pathologic growths, etc., has increased. As was demonstrated in a two-year study, electromyography is a valuable method for more accurate recognition of different forms of inflammation. Thanks to their atraumatic nature, the speed of use and high informativeness, radioisotopic methods and ultrasonic scanning have been advanced in a number of very promising directions.

Perinatal loss is made up of two components: the elements of innate selection of the species and so-called random selection, or avoidable loss, caused by obstetrical pathology. From this perspective, at the present time, focus on prenatal protection of the fetus should be increased. Early diagnosis of congenital pathology with the aid of genetic methods of investigation, including such new methods as chorionic biopsy, even at early stages of

pregnancy (the first trimester), helps resolve questions of advisability of fetal preservation. Important data on the state of the fetus and character of development of the pregnancy can be obtained on the basis of ultrasonic, electrophysiologic and endocrinologic methods. Of central importance in the decrease in perinatal mortality and pathology has been elucidation of the causes for incomplete pregnancy and the development of methods for its prophylaxis and treatment.

One of the cardinal areas of study is prophylaxis and early detection of complications which arise during the birth process in the mother and fetus. Therefore, use of monitoring systems for tracing the character of birth activity and the state of the fetus is a mandatory prerequisite for management of labor and delivery in women in a "risk group", especially those in a high risk group. Of special importance, is rational monitoring of labor and delivery with correction of contraction activity of the uterus and use of a rational combination of spasmolytic, anesthetic and stimulative agents.

In pediatric surgery, new types of operative intervention, and assimilation of the achievements in scientific-technical progress are being actively developed. Thus, use of gnotobiotic methods are especially promising for the resolution of a complex of problems related to surgical infection. The creation of an antiseptic atmosphere using special isolators is based on such methods. A new therapeutic direction has been developed for more serious complications of the acute septic process in lungs--pyopneumothorax and pneumothorax; with the use of methods for timely occlusion of bronchi, doctors have succeeded in achieving recovery in 90 percent of children, including those of very young age. A new surgical tactic has been proposed for the most serious forms of acute pulmonary and pulmono-pleural suppuration. This approach includes new types of life-saving operations--pneumoabscessotomy in correlation with timely endoscopic or operative occlusion of the bronchi.

In very young patients, it is difficult to use stress tests or invasive methods to evaluate respiration, hemodynamics and to determine the biochemical indices for which blood tests are necessary. As a result, a complex of investigations has been developed which makes it easier to diagnosis pathologic states and to manage intensive therapy. One of the most important aspects of intensive therapy is correction of respiratory insufficiency. Modern respirators allow artificial ventilation of lungs in a sequence which gives the patient the capacity of breathing spontaneously in intervals between "breathes" of the apparatus. This is especially valuable for treatment of children where synchronization of respiration of the patient with the work of the apparatus is extremely difficult. Studies have shown the necessity for use of hyperbaric oxygenation during resuscitative measures. In the arsenal of methods for active detoxification of the child organism, hemadsorption and exchange transfusion have assumed an essential role.

Along with the development of polyclinic services, the network of pediatric hospitals has increased significantly. In recent years, special attention has been directed to the creation of specialized departments and hospitals for newborns and the care of premature children. In republic and large regional centers, departments for newborns with surgical, neurologic and other

pathologies have been organized. Under the auspices of many large hospitals, republic and oblast specialized centers are functioning in all the republics: nephrologic, allergic, neurologic, surgical, ophthalmologic and others.

Study of the problem of care for premature children has allowed physicians to trace in these children the earliest stages of the formation of metabolic processes and adaptational mechanisms. The principles for the formation of the enzymatic-excretory function of the intestines, the basic stages of development of the system of secretory immunoglobulins and the characteristics of the formation of intestinal microflora have been established. At the present time, pediatric dietology has a markedly expanded sphere of influence. For example, utilization of nutritional products with a prescribed chemical composition has been a successful therapy for children with inherited metabolic pathology.

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9139

CSO: 1840/504

## PREVENTIVE EXAMINATIONS IN HEALTH CARE

Riga SOVETSKAYA LATVIYA in Russian 7 Mar 84 p 4

[Text] (Latinform)--The new building of the Valmiera polyclinic is located in the scenic environs of Gauji, among the ancient pines. This modern, excellently equipped medical institution is designed to handle 850 visits per shift, and has become the eleventh public-health services unit to become operative in the period between elections. In that period, further construction of the large Gayl'ezers complex in the capital of the republic has continued. New hospitals in Riga, Limbazhi, and Sigulda are receiving adult and child patients, and the doors have been opened at polyclinics in the settlements of Eleja, of the Elgava Rayon, Adazhi, of the Riga Rayon, and Smiltena, of the Valka Rayon.

"In recent years, the medical material-technical base has grown considerably," noted G. Ya. Orlean, Latvian SSR deputy minister of health, in a conversation with our correspondent. This has had a positive effect on the development of the network of medical institutions. In the republic today there are 46 physicians for every 10,000 people. This is a high ratio. The ever increasing resources, which are being allocated for the needs of public health services, have allowed a significant rise in the supply of technology and equipment at medical institutions, and consequently a rise in the quality and level of health care.

At the 26th CPSU Congress as well as at the June (1983) Plenum of the CPSU Central Committee, an important task was set--to conduct annual [preventive] dispensary examinations of the entire population of the country. What goal does Soviet medicine strive for, undertaking to fulfill this task?

As is known, health is what people want most of all to preserve, and yet take least care of. And consultation with a physician is at times belated. Introduction of an annual dispensarization of the entire population is one of the means of early detection of disorders; because it is exactly this way that it is possible to discover and treat them in the early stages. From the beginning of time the task of medicine has been healing. Now a qualitatively new stage is approaching, when physicians strive to foresee an incipient ailment and keep it from developing.

We will begin the mass examinations six months earlier than was outlined. In the course of preparation for them, the methods of conducting them have been worked out sufficiently. Great experience has been accumulated pertaining to the systematic observation of health among separate groups of the population--



workers of certain enterprises, pregnant women, children, and athletes, as well as people suffering from cardiovascular, oncological, and other disorders. In our republic, periodic preventive examinations of the inhabitants are widespread. This valuable experience will undoubtedly contribute to the successful conducting of universal annual examination.

A system of complex automated preventive medical examination has been developed by Latvian specialists. A computer, which will process the forms filled out by patients, will give the physician a maximum of information with a minimum of analysis. Such computers have been installed in the nine largest medical institutions of Riga, Valmiera, Tukums, and Rezekne. Six city and the same number of rayon polyclinics have at their disposal specially equipped departments for preventive examination. And soon the establishment of similar departments will be complete everywhere.

How will the specifics of the republic be taken into consideration in the organization of examinations, since some of the people, especially the elderly, still live on farms?

A mobile dispensary on wheels will come to them equipped with portable laboratory equipment for express [rapid] diagnosis. Our employees will help retired people fill out health forms. The processing of the forms will be done by computer, and in individual circumstances by hand, with the application of a template. This year computers will already be "registered" in every city and rayon polyclinic in the republic.

In January more than 60,000 people had already undergone the required examination. The registration of the adult population in cities and in the countryside is complete. In the first stage of this examination program, planned for 3-4 years, with the help of the complex automated preventive medical examination, we can discover the early symptoms of cardiovascular, oncological, pulmonary, endocrine, and other--15 in all--ailments. The second stage, which stipulates a wider and more complex spectrum of analyses, will require more personnel. Preparation for it will be conducted in a number of Latvian medical institutions. Successful solution of so many vital tasks will serve further development and improvement of the general line of Soviet health care--its preventive direction.

12461

CSO: 1840/501

## OPENINGS FOR GRADUATE WORK AND CLINICAL INTERNSHIP

Minsk SOVETSKAYA BELORUSSIYA in Russian 21 Mar 84 p 4

[Text] The Belorussian SSR Ministry of Health announces enrollment for Aspirantur and clinical Ordinatur for 1984.

### Aspirantur Openings

#### Minsk State Medical Institute

Discontinuing present work, in the specializations of microbiology, obstetrics and gynecology, human anatomy, internal diseases, hygiene, pathological anatomy, pathological physiology, radiology, stomatology and surgery; not discontinuing present work (correspondence), in the specializations of eye diseases, pediatrics, surgery.

#### Grodno State Medical Institute

Discontinuing work, in the specialization of human anatomy; not discontinuing work (correspondence), in the specialization of internal diseases.

#### Scientific Research Institute of Oncology and Medical Radiology

Discontinuing work, in the specialization of oncology.

#### Scientific Research Institute of Epidemiology and Microbiology

Discontinuing work (special) with training at the Institute of Virology imeni D. I. Ivanovskiy (Moscow) in the Specialization of Belorussian Institute for Advanced Training of Physicians

Discontinuing work, in the specialization of obstetrics and gynecology.

### Clinical Ordinatur

#### Minsk State Medical Institute

In the specialization of obstetrics and gynecology, ear, nose and throat diseases, internal diseases, eye diseases, dermatology and venereal diseases, neurology, radiology, stomatology, traumatology and orthopedics, surgery, anesthesiology, urology, phthisiology, neurosurgery, and tropical medicine (special) with training in Moscow.

#### Grodno State Medical Institute

In the specialization of obstetrics and gynecology, therapeutics, pediatrics, surgery, phthisiology, radiology, eye diseases, ear, nose and throat diseases, infectious diseases, dermatology and venereal diseases, forensic medicine, and pathological anatomy.

#### Belorussian Institute for Advanced Training of Physicians

In the specializations of obstetrics and gynecology, therapeutics, surgery, cardiology, pediatrics, radiology, clinical laboratory, dermatology and venereal diseases, eye diseases, ear, nose and throat diseases, urology, anesthesiology and reanimation, traumatology and orthopedics.

#### SCIENTIFIC RESEARCH INSTITUTES OF CARDIOLOGY

In the specialization of cardiology.

#### Dermatology and Venereology

In the specialization of dermatology and venereal diseases.

#### Neurology, Neurosurgery and Physical Therapy

In the specializations of neurology and physical therapy.

#### Oncology and Medical Radiology

In the specializations of oncology and medical radiology of Maternity and Child Protection

In the specialization of pediatrics

#### Traumatology and Orthopedics

In the specializations of traumatology and orthopedics.

The duration of training in graduate work, discontinuing work, is three years; without discontinuing work (correspondence) it is four years, and for the clinical internship, two years.

Individuals are being accepted for the Aspirantur up to 35 years of age (45 for correspondence), who have completed higher education and not less than two years of practical work experience in the chosen field of specialization (for physicians who have finished internship, the required two-year term of work in the specialization that is necessary for acceptance into the graduate program is counted from the time of completion of the internship). Young specialists may be admitted to the program immediately after completing a higher educational institution on the recommendation of the council of the higher educational institution.

Physicians are being accepted for Clinical Ordinatur up to 35 years of age, and who have not less than three years of practical work on completion of the institute (after the completion of the internship for those who have finished an internship).

Individuals who have the three-year practical term and who have undergone specialization or advanced training in the advanced training institutes for physicians may participate in the competition for the clinical Ordinatur if one year of work has expired since the specialization or advanced training.

Applications for admission to the Aspirantur or Clinical Ordinatur should be addressed to the dean (director) of the institute; a resume should be enclosed with a photograph, an autobiography, copy of the diploma attesting to the completion of an institute of higher education, and recommendation from the last place of work, given for participation in the competition.

Applicants for the Aspirantur will also submit a list of scientific publications; those who have none will submit a scientific report (paper) on the chosen specialization, certification on form No. 6 of having passed the graduate examinations (for those who have, partly or in full, passed the graduate examinations), an excerpt from the minutes of the council session of the institute (for those who are being recommended for the Aspirantur by institute of higher education councils immediately after finishing the institute).

All specialists applying for the Aspirantur program will have a required interview with the proposed scientific supervisor.

Applicants for the Aspirantur pass competitive examinations in the specialization, the history of the CPSU, and one of the foreign languages included in the program of the higher educational institutions. Applicants for special graduate work will pass entrance exams at the institute where they will take their training.

Individuals who have passed in full the Aspirantur examinations specified for the given specialization are released from the entrance exams on acceptance to the Aspirantur program.

Those who are admitted to the examinations for Aspirantur work with or without discontinuing work are granted 30 calendar days of additional leave with pay for preparation and taking the exams.

Applications for graduate work and clinical internship are accepted until June 1, 1984. Examinations for graduate work are from 15 June. The beginning of studies for graduate work and clinical internship is September 1.

Aspirantur students discontinuing work and Clinical Ordinatur students are guaranteed a stipend of a fixed amount.

Those who complete Aspirantur study, with a discontinuation of work, and Clinical Internship study are subject to personal assessment.

UDC 616.15-082-039.57(47+57)

#### AMBULATORIUM-POLYCLINIC HEMATOLOGICAL AID IN USSR

Moscow GEMATOLOGIYA I TRANSFUZIOLOGIYA in Russian No 11, Nov 83  
(manuscript received 16 Mar 83) pp 3-6

TOKAREV, Yu. N., professor, BARONINA, M. A., KOVALEVA, L. G., professor, KOCHEMASOV, V. V. and RZHANOVICH, A. P., Central Scientific Research Institute of Hematology and Blood Transfusion, USSR Ministry of Health, Moscow

[Abstract] A study of ways to improve ambulatorium-polyclinic hematological aid in the USSR included an analysis of the existing organization of operation of hematological institutions, examination of the provision of hematological aid at the Union and Republic levels, comparative study of provision of hematological ambulatoria aid in urban and rural areas, overall needs for ambulatorium-polyclinic hematological aid and the need for integrate the hematological service. On the basis of findings of this study, it was found that further improvement of ambulatorium-polyclinic hematological aid calls for a diversified approach according to specific needs of different areas of the USSR. Areas in which specific geoclimatic and genogeographic factors promote the rise of hemoglobinopathy and enzymopathy must have highly-specialized aid available. Emphasis must be placed on improvement of diagnosing, preventing and treating iron-deficiency anemias.  
[482-2791]

UDC 616.15-082:001(47+57)

#### SCIENTIFIC-ORGANIZATIONAL FORMS OF IMPROVING OUTPATIENT HEMATOLOGICAL AID TO PEOPLE

Moscow GEMATOLOGIYA I TRANSFUZIOLOGIYA in Russian No 11, Nov 83  
(manuscript received 10 Dec 8? - year incomplete) pp 10-16

SUSHCHENKO, I. B., KORCHMARU, I. F., SEPP, L. O., BAYKALOV, V. I., MOSKOV, V. I., KOKHNO, L. N., FILIPPOVA, A. V., DEMCHENKO, E. V., DEKHTYAR', M. G., ABELOVICH, I. S., PELIPAS, A. S., VINOKUROVA, T. S., BABAYEVA, Z. M., KRAVISHVILI, R. I., MAL'TSEVA, V. P. and NURUTDINOVA, T. F.

[Abstract] A comprehensive study of hematological aid made it possible to propose a scientifically valid procedure for improving the organization of

hematological aid to the people. Data from a "Record of a Patient's Visit to the Hematological Department of the Polyclinic" was used in combination with expert assessments of the present situation in order to work out improvements. Breakdown of 3786 visits recorded in the record provided a breakdown of hematological service provided in terms of sex of patients, age of patients, single or multiple visits for aid, disease entity involved, etc. Recommendations for improving hematological out-patient aid included: development of accessible hematological aid for the rural population: development of a differentiated approach to arranging consultation with a hematologist and performance of a thorough medical examination of the patient beforehand and revision of the list of nosological forms to be included in the list of patients to be examined by a hematologist.  
[482-2791]

UDC 616-006.6-084.003.1

#### ECONOMIC ASPECTS OF CANCER CONTROL

Moscow VOPROSY ONKOLOGII in Russian Vol 29, No 11, Nov 83, pp 8-13

CHISSOV, V. I., RUTGAYZER, B. M., SHUBIN, B. M., KHADZHIYEV, M. A. and ALEKSANDROVA, L. A., Moscow Scientific Institute of Cancer Research imeni P. A. Gertsen, Scientific Research Institute of Economics, USSR Gosplan, USSR, Moscow

[Abstract] Costs of cancer detection and treatment and economic losses coming from incapacity and premature death due to the disease are discussed in general and illustrated, with data concerning breast cancer being used as a model. Analysis of more than 500 histories of cases of breast cancer made it possible to determine bed-days required for surgical, radiological and chemotherapy procedures and the cost for one bed-day for each department. From these data, it was found that cost of treatment of one patient ranged from 400 rubles (in first stage of the disease) to 2200 rubles (in fourth stage of the disease). Other costs include the expense of providing social insurance for the cancer victim, loss of production from invalidism due to the disease and loss of production because of premature death. The social gain from medical treatment of this disease was shown by analysis of outcomes of 124 cases of breast cancer. The mean age of women who were able to return to work was 45.2 years which means that they will probably be able to perform productive labor for at least 10 more years. Successes in treating this disease have already provided social economic benefits of 6,700 rubles per case. Each percent of reduction of mortality rate from this disease will provide an economic social benefit of 2,900 rubles for each case. References 7: (Russian).  
[479-2791]

## ORGANIZATION OF CANCER REGISTRATION

Moscow VOPROSY ONKOLOGII in Russian Vol 29, No 2, Feb 83 (manuscript received 11 Mar 82) pp 72-74

BERZIN, S. A. and GOLOD, V. N., Sverdlovsk Oblast Oncological Dispensary, Sverdlovsk

[Abstract] Studies performed by Sverdlovsk Oblast Oncological Dispensary personnel showed that cancer registration inaccuracies occur because of failure of rayon oncological offices to provide complete and timely data on this matter, failure of the rayon oncological network preventive dispensary to provide adequate information about patients treated in the dispensary, lack of proper communication between the oncological service and major municipal clinical hospitals and failure to report diagnoses of cancer made shortly before death or at autopsy. Recognition and correction of these defects by the staff of the Cancer Control Department of the Sverdlovsk Oblast Oncological Dispensary to increase cancer registry from 59.8 to 100 percent from 1960 to 1980. Figures for various forms of cancer for the same period are: cancer of the esophagus--from 70.3 percent to 100 percent; stomach cancer--from 62.5 percent to 100 percent; cancer of the rectum--from 74.3 percent to 100 percent; lung cancer--from 60.3 percent to 100 percent and cancer of the blood-forming organs, from 24.6 percent in 1965 to 100 percent in 1980.

[480-2791]

UDC 616.33-006.5

## SELECTION OF METHOD OF TREATING GASTRIC POLYPS

Moscow VOPROSY ONKOLOGII in Russian Vol 29, No 2, Feb 83 (manuscript received 20 Sep 82) pp 74-79

NIFANT'YEV, O. Ye., KOTOV, G. F. and MEDVEDEV, V. N., Krasnoyarsk Medical Institute, RSFSR Ministry of Health

[Abstract] Examination of 107 persons with gastric polyps indicated that there is no single treatment procedure suitable for all cases. Method of treatment is selected in each case after examining the morphostructure of the polyps and the morphofunctional state of the stomach mucous membrane. Endoscopic polypectomy is indicated when the degree of dysplasia does not exceed the third stage limited to the polyp with no pronounced dysplasia in the stomach mucous membrane. Surgical exsection of polyps with part of the stomach wall is indicated when the polyps are large and on a broad base with no signs of malignancy or precancerous changes in the mucosa. Stomach resection is indicated when there is malignization of the polyps and three degree dysplasia of the stomach mucosa. Extent of surgery depends upon the degree of pronouncement and spread of dysplasia of the mucosa and the location of polyps.

Observation of the patient without surgery is possible only in rare cases when there are no precancerous changes and the opportunity to maintain systematic endoscopy is present. Figure 1; references 16: 11 Russian, 5 Western.  
[480-2791]



## PSYCHOLOGY

UDC 15

### SCIENTIFIC AND ORGANIZATIONAL ACTIVITIES OF INSTITUTE OF PSYCHOLOGY OF USSR ACADEMY OF SCIENCES

Moscow VESTNIK AKADEMII NAUK SSSR in Russian No 2, Feb 84 pp 10-21

[Abstract] A report summarizing the activities of the Institute of Psychology of the USSR Academy of Sciences for the period 1977-1982 was presented by corresponding member of the Academy and director of the Institute B. F. Lomov. Research at the Institute follows both theoretical and practical directions and the currently major areas of interest are general psychology, social psychology, engineering and work psychology, and physiological psychology. In organizational terms, research at the Institute is both general and specialized, i.e., all departments and laboratories at the Institute are involved in three or four general problems and, in addition, each laboratory also conducts research in its own specialized field. Considerable attention is accorded to the philosophical and methodological foundations of the psychological sciences, and every effort is made to insure close cooperation with institutions and enterprises where research results find practical applications. In addition, Academician D. M. Gvishiani reported on certain extramural activities of the Institute and the need for reorganization in certain spheres of activity, and of need for support from the Academy for the proposed reference journal PSIKHOLOGIYA and in the preparation of a Psychological Encyclopedia.  
[252-12172]

### PSYCHOLOGICAL PROBLEMS IN FORMATION OF NEW MAN

Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 4, No 6, Nov-Dec 83 pp 20-29

BODALEV, A. A. and SHOROKHOVA, Ye. V., Psychology Department, Moscow State University; Institute of Psychology, USSR Academy of Sciences

[Abstract] Based on the directives provided by the June 1983 Plenum of the CC CPSU, which once more emphasized the fact that the formation of a New Man is an intrinsic aspects of building communism, an outline is provided of the responsibilities and tasks of Soviet psychology in carrying out this program. For psychology this means placing increasing emphasis on multifaceted analysis

and evaluation of the steps involved in the formulation of a communist personality. To a large extent this involves instillation of communist values and a sense of group responsibility early in life, and the correction of negative tendencies which find manifestation in egotism and individualism to the detriment of the community as a whole. Success, of course, will entirely depend on the approaches that the psychologists take in providing the proper educational environment. Consequently, the decisions of the June 1983 Plenum are objects of serious study by psychologists who wish to fortify the theoretical foundations of their research and practical work with people. References 13: (Russian).

[446-12172]

#### DIFFERENTIAL THRESHOLD IN PSYCHOACOUSTICS

Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 4, No 6, Nov-Dec 83 pp 62-70

INDLIN, Yu. A., Scientific Research Institute of Motion Pictures and Photography

[Abstract] Experimental studies were conducted with continuous and intermittent acoustic stimulation to determine whether a subthreshold region exists in psychoacoustics, i.e., a differential threshold of perception. Continuous exposure to a standard acoustic stimulus leads to the formation of a differential sensory threshold, the magnitude of which is predicated on the statistical correlates of perception elicited by the standard stimulus. Sensations which exceed the sensory threshold are ranked according to magnitude and treated as a variable stimulus, while those below the threshold are treated as being evoked by the standard stimulus. In this case, the expanse of perception is continuous but limited. However, with intermittent standard stimulation such a threshold is lacking and the perceptive region is regarded as continuous but limited. In this sense, the Fechner concept of a boundary area separating the gain in a physical stimulus into categories that are perceived and not perceived, i.e., an instantaneous differential threshold, appears to be questionable. Figures 5; references 15: 11 Russian, 4 Western.

[446-12172]

#### DEVICE FOR OPERATIVE MEASUREMENT OF DOMINANCE AND LEADERSHIP

Moscow PSIKHOLOGICHESKIY ZHURNAL in Russian Vol 4, No 6, Nov-Dec 83 pp 122-127

MATALINA, T. A. and SEMENYUK, Ye. Ya., Leningrad Electrotechnical Institute

[Abstract] Description is provided of two electromechanical devices intended to test paired individuals for dominance and leadership characteristics. The devices are designed for cooperative and corrective motor actions to be performed, with the numerical equivalents of normal task function and corrective or compensatory work evaluated statistically for correlation with psychological tests measuring leadership and dominance. The high degree of positive correlation between the physiological test parameters and the results

of standard psychological tests indicates that the former approach can be regarded as a means of psychophysiological assessment of an individual's dominance rank and leadership potential vis-a-vis his partner. In addition, this technique may be useful in psychotherapeutic management of patients with functional neurosis resulting from inadequate leadership drive, for the evaluation of compatibility of team or crew members, and for testing for leadership in scientific research on the psychology of personality in social psychology. Figures 3; references 6: (Russian).

UDC 616.89-008.441.13-08-036.868

#### PSYCHOLOGICAL DIAGNOSIS AND REHABILITATION OF ALCOHOLICS

Moscow ZHURNAL NEVROPATOLOGII I PSIKHIATRII in Russian Vol 83, No 12, Dec 83  
(manuscript received 25 Jan 83) pp 1827-1830

MEYERZON, M. M. and PIRNAT, K. F., No 2 Gomel Oblast Psychiatric Hospital

[Abstract] MMPI was employed in the case of 92 patients with stage I and II alcoholism to obtain personality inventories in the first 7-10 days of abstinence during hospitalization, and 2-3 days before discharge. The group consisted of individuals 20-54 years of age with varied educational backgrounds and a history of alcohol abuse for 3-5 years. On the basis of the MMPI six personality group portraits were produced, and psychotherapy was conducted accordingly with each category of patients. Readministration of the MMPI prior to discharge showed marked personality improvements in each group, and demonstrated the utility of the MMPI in designing tailor-made psychotherapy. References 5: (Russian).  
[475-12172]

UDC 597.562

DEVELOPMENT OF SIX GLANDS IN RAINBOW TROUT SALMO GAIRDNERI RICH (SALMONIDAE)  
IN POSTRADIATION PERIOD. 1. IRRADIATION OF LARVAE 24 DAYS AFTER HATCHING

Moscow VOPROSY IKHTIOLOGII in Russian Vol 23, No 6, Nov-Dec 83  
(manuscript received 11 Jun 82) pp 951-960

ZAKHAROVA, N. I., Leningrad State University

[Abstract] In order to study the reaction of the sex glands to radiation during the indifferent stage, 24-day old rainbow trout (*Salmo gairdneri* Rich) larvae were exposed to 25, 350 or 1000 R X-rays. Histological and histochemical analyses were conducted on the exposed fish, up to 147 days after hatching. While gonad development in the fish exposed to 25 R did not differ significantly from controls, those exposed to the higher doses exhibited very few sex cells at 37 days. Partial recovery began at 67 days for 350 R and 97 days for 1000 R; at 147 days 57% and 31% of the control level of germ cells was seen in each group respectively. Radiation enhanced the asynchronicity in development of the right and left gonad. Increased activity in the germinative epithelium after radiation was noted, indicating that this is the main source of the sex cell recovery. Initiation of cytological sex differentiation in females was retarded from 37 days to up to 147 days by the radiation. Anatomic differentiation in both sexes, which began at 52 days and was completed at 82 days in controls, was also delayed by the 350 R or 1000 R exposure. Figures 3; references 27: 12 Russian, 15 Western.  
[456-12126]

UDC 577.34

EFFECT OF TEMPERATURE ON POSTRADIATION SURVIVAL RATE OF BRINE SHRIMP ARTEMIA  
SALINA(L)

Kiev GIDROBIOLOGICHESKIY ZHURNAL in Russian Vol 20, No 1, Jan-Feb 84  
(manuscript received 5 Mar 81) pp 61-65

RADCHENKO, L. A., Institute of Biology of the South Seas, UkSSR Academy of Sciences, Sevastopol

[Abstract] Study of the effect of temperature on postradiation survival rate of one-day old *Artemia* nauplii irradiated with doses of 2.5, 5, 7.5 and 10 Gy

and grown in sea water at 15, 22, 25 and 27°C showed that cultivating Artemia in a range of temperatures unfavorable for their development (15-22°C) amplifies the inhibiting effect of irradiation even in doses which produce a stimulating effect under optimum conditions. The relationship of the effect of irradiation and the temperature of the Artemia cultivating medium must be considered when assessing the effect of specific doses. The direct dependence of Artemia survival rate on temperature of the medium increases with aging of the shrimp as does the inverse dependence on the irradiation dose in comparison with the control. Figure 1; references 2: (Western).  
[460-2791]

UDC 577.391:376.314+809.51

#### RADIATION DAMAGE OF PLASMA MEMBRANE AND LETHAL EFFECTS ON CELLS

Moscow USPEKHI SOVREMENNOY BIOLOGII in Russian Vol 97, No 1, Jan-Feb 84  
pp 146-158

DOMENKO, B. S. and AKOYEV, I. G., Institute of Biological Physics, USSR Academy of Sciences, Pushchino, Moscow Oblast

[Abstract] A literature survey is presented on the current concepts of ionizing radiation damage to the plasma membranes of prokaryotic and eukaryotic cells, and the significance of such lesions for cell survival and death. By and large, such damage stems from the action of the various radicals formed during radiolysis of water which impinge on the cytoplasmic membrane as the first and primary target. Confirmation for the role of plasma membrane damage as the key factor leading to cell death comes from studies with chemical radio-protectors and radiosensitizers that themselves fail to enter the cell and yet exert a modifying effect. In the prokaryotic cells, lethal effects of radiation are more readily appreciated and attributed to the direct involvement of the plasma membrane in DNA replication and the attendant disruption of this process. In the eukaryotic cells the effects remain more problematical, although a primary membrane involvement also seems reasonable. References 142: 24 Russian, 118 Western.  
[521-12172]

UDC 619:616-006+612.017.006

IMMUNOLOGICAL CHARACTERISTICS OF CATTLE LYMPHOLEUKOSIS (14. CELLULAR AND HUMORAL IMMUNITY FACTORS)

Vilnius TRUDY AKADEMII NAUK LITOVSKOY SSR. SERIYA B. in Russian No 4(84), 1983 (manuscript received 7 Jul 82) pp 61-69

LUKSHIS, L. P., ACHAYTE, Yu. Yu. and DABKYAVICHYUS, V. B., Institute of Biochemistry LiSSR Academy of Sciences

[Abstract] The state of certain cellular (slow hypersensitivity) and humoral (antibody formation) immunity factors was studied in chronic cattle lympholeukosis. In comparing 75 cows with the lympholeukosis to 35 normals, no difference was seen in allergic skin reaction to tuberculin, phytohemagglutinin and zymosan, while hypersensitivity to dinitrochlorobenzene was somewhat depressed in the experimental animals. This depression was more severe in animals with advanced cases of the disease. Appearance of agglutinin in the serum after vaccination with Br. abortus bovis, on the other hand, was substantially decreased in cows with chronic lympholeukosis, more severely in later stages of the process. The literature indicates that the depressed reaction of T-lymphocytes to various mitogens is a result of the disturbed ratio between T- and B-lymphocytes and the defective function of the latter in this disease. The hypersensitivities observed in the diseased cattle confirm that the T-cell system is not overly disturbed by this condition, and that cellular immunity is at most only slightly weakened. Diminished agglutinin formation is a consequence of defective B-lymphocytes. The data indicate that humoral immunity is strongly suppressed in chronic cattle lympholeukosis, while cellular immunity is either unaffected or slightly weakened. Hence, this condition is a B-cell lymphoproliferative illness. Figures 1; references 25: 11 Russian, 14 Western. [464-12126]

UDC 636.4:616.34.002:[578.823.91+578.834.1]

VIRAL ASSOCIATIONS IN SWINE GASTROENTERITIS

Moscow SEL'SKOKHOZYAYSTVENNAYA BIOLOGIYA in Russian No 2, Feb 84 (manuscript received 19 Mar 83) pp 92-95

SLOBODENYUK, V. K., KVASHKINA, G. A., RABOVSKAYA, L. A., TATARCHUK, A. T. and PLOTNIKOV, N. P., Sverdlovsk Oblast Scientific Research Veterinary Station

[Abstract] Pathologic studies carried out on 2-7 day old piglets with prolonged gastroenteritis (February-May) demonstrated, on the basis of electron

microscopy, involvement of rotaviruses as the etiologic agent in a disease that carried a 70% mortality rate. In later stages of the disease the rotaviruses were supplanted by coronaviruses. Histologic analysis of the intestines and other organs revealed desquamation of the intestinal villous epithelium, hyperemia and punctate renal hemorrhages, among other findings characteristic of such conditions. Figures 1; references 7: 3 Russian, 4 Western.  
[491-12172]

## VIROLOGY

### TRANSFORMATION AND MUTATION OF CHINESE HAMSTER CELLS IN VITRO WITH AID OF VARIOUS NUCLEOPROTEIN COMPLEXES OF SV40 VIRUS

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 1, Jan 83 (manuscript received 26 Jan 82, final draft received 21 Jun 82) pp 1-11

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[Abstract] A study confirming the capacity of various SV40 histone complexes to transform and mutate Chinese hamster cells in vitro is described and discussed. SV40 minichromosomes (MKhM) isolated from SV40 infected monkey cells (native MKhM) or reconstructed in vitro from virus DNA and fractions of histones H1 isolated from calf thymus may produce these phenomena. Reconstructed MKhM transformed and mutated Chinese hamster cells with about the same effectiveness as purified DNA of SV40 but native MKhM was 10-200-fold more active. All transformed cell clones and a large part of the isolated mutant cell clones obtained after inoculation of Chinese hamster cells with SV40 virus MKhM expressed SV40 T antigen. Addition of H1 both to purified DNA of SV40 and to reconstructed MKhM greatly reduced the transformation activity of both agents. Possible explanations of the inhibiting action of H1 are discussed. Figures 2; references 29: (Western). [468-2791]

### HOMOLOGY OF SEQUENCE OF NUCLEOTIDES OF HUMAN RHEOVIRUSES

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 1, Jun 83 (manuscript received 4 Jan 82, final draft received 15 Apr 82) pp 27-33

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[Abstract] A study of homology of rheovirus serotypes with the use of a hybridization test on polyacrylamide gel was described and discussed. The degree of homology between human rheoviruses types 1, 2 and 3 was determined. It was found that the 3 types have significant homology of large segments and very little homology of medium and small segments. References 10: (Western). [468-2791]



PRODUCTION OF MONOCLONAL ANTIBODIES WITH ANTIHEMAGGLUTININATING ACTIVITY TOWARD  
SKALICA STRAIN FROM COMPLEXES OF TICK ENCEPHALITIS VIRUS

Bratislava ACTA VIROLOGICA in Russian Vol 17, No 1, Jan 83 (manuscript received  
20 Apr 82) pp 34-42

NOVAK, M., GRESIKOVA, M., SEKEYOVA, M., RUSS, G., ZIKAN, J., POSPISIL, M. and  
CIAMPOR, F., Institute of Virology, Slovak Academy of Sciences, Bratislava,  
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Prague, Czechoslovakia

[Abstract] Characteristics of hybridomas which secrete monoclonal antibodies  
to tick encephalitis virus strain Skalica are described and discussed. Blending  
myeloma line PS-NSI-Ag-4 cells with cells from BALB/c mice, immunized by pure  
virus of strain Skalica produced hybridomas which secrete monoclonal antibodies  
with anti-hemagglutinating activity to Skalica strain from a complex of tick  
encephalitis viruses. The highest titers of monoclonal antibodies obtained  
from S-9, S-15 and S-14 hybridomas varied from 512 up to 10,240 and the level  
of monoclonal antibodies in the ascitic fluid reached 4.6 mg/ml. Immunodiffusion  
by the Ouchterlony method and electrophoresis on agarose and polyacrylamide  
gel and sodium dodecylsulfate showed that hybrid clones S-9, S-15 and S-16  
secrete monoclonal antibodies of isotype  $\mu$  of the heavy chain and isotype  $\kappa$  of  
the light chain. Specificity of the monoclonal antibodies is confirmed in  
hemagglutination inhibition tests with 11 different antigens from the  
Togaviridae family. Figures 8; references 27: (Western).  
[468-2791]

ANTIRABIES VACCINE PRODUCED FROM VIRUS GROWN IN JAPANESE QUAIL EMBRYO CELL  
CULTURE

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 1, Jan 83 (manuscript received  
21 Jan 82, final draft received 26 Apr 82) pp 59-64

BEKTEMIROVA, M. S., PILLE, E. R., MATEVOSYAN, K. Sh. and NAGIYEVA, F. G.,  
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[Abstract] Data indicating the possibility of producing sufficiently active  
antirabies vaccine from Moscow Scientific Research Institute of Virus Prepara-  
tions-74 strain rabies virus, grown on Japanese quail-embryo cells, are pre-  
sented and discussed. The advantage of using Japanese quail-embryo cells  
over hamster-kidney cells lies in the fact that they are available in  
unlimited quantities throughout the year. Tests on laboratory animals con-  
firmed the pronounced antigenic and immunogenic activity of the vaccine. Two  
schemes of injecting the preparation were tested on volunteers. Injection of  
2 ml of the preparation on the 0, 3, 7 and 14th days with two-fold revaccina-  
tion on the 30th day and 90th day produced more intense and prolonged anti-  
bodies production than daily injections for 14 days. References 9: 1 Russian,  
8 Western.  
[468-2791]

#### INTERFERON INDUCTION BY FLAVIVIRUSES AND ORBIVIRUSES IN L-M LINE CELLS

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 1, Jan 83 (manuscript received 5 Mar 82) pp 80-82

KEDARNATH, M., CECILIA, D., GORE, M. M., BANERJEA, A. S. and GHOSH, S. N., National Institute of Virology, Poona, P. B. No. 11, India

[Abstract] Capacity of 6 strains of flaviviruses and 5 strains of orbiviruses to induce interferon in mouse fibroblasts cells (L-M) is compared and discussed. Flavoviruses were weaker inducers of interferon in L-M cells than orbiviruses. The greater inducer capacity of the orbiviruses is assumed to be due to the two-chain structure of RNA of the orbiviruses. Paliyam orbivirus was found to be one of the most potent interferon inducers among the orbiviruses. References 10: (Western).  
[468-2791]

#### INTERFERON-INDUCED ACTIVITY OF SALMONELLA MINNESOTA RE OF GLYCOLIPID-ANTI-GLYCOLIPID IMMUNE COMPLEXES

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 1, Jan 83 (manuscript received 4 Mar 82) pp 83-85

YESHKENAZI, M., GALABOV, A. S., MASTIKOVA, M., KONSTANTINOV, G. and TEKELIYEVA, R., Department of Virology, Institute of Infectious and Parasitic Diseases, Medical Academy, Sofia, Bulgaria

[Abstract] Immune complexes were prepared from Salmonella minnesota Re glycoside with homologous glycosides to test interferon-induction activity. Optimum concentration of glycolipid of 0.125  $\mu$ g/ml in combination with glycolipid antibodies produced a 2-fold increase of interferon production. Higher GL concentrations (1.25 and 12.5  $\mu$ g/ml) cause a 4 to 32-fold increase of interferon titer. Similar results are obtained with the same concentrations of dimethylsulfoxide (DMSO) GL. The increase of interferon-induction activity of GL in an immune complex agrees with previous findings that indicate that detoxification of enterobacterial lipopolysaccharides increases their capacity to induce interferon. References 13: 3 Russian, 10 Western.  
[468-2791]

#### OPTIMUM CONDITIONS FOR IN VITRO PRODUCTION OF TICK-BORNE ENCEPHALITIS VIRUS

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 2, Mar 83 (manuscript received 15 Jul 82) pp 97-104

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[Abstract] Conditions were determined for the optimal production of tick-borne encephalitis virus in chick embryo tissue cultures (CETC). With dense monolayer

cultures initially grown at 37°C for 16 h in medium 199 or Eagle's medium supplemented with 10% calf serum in phosphate-buffered saline, pH 7.2, and subsequently infected with the virus in low multiplicities of infection (0.03-0.05 LD<sub>50</sub> per cell) in HEPES-buffered saline (serum-free), maximum virus harvests were obtained within 24 to 47 h of infection. The HEPES-buffered medium was adjusted to pH 5.6 at 24°C, although it is recognized that at 36°C the pH shifts to 7.32. The method was also suitable for radiolabeling of the viral particles, while electron micrographs demonstrated typical viral morphology. Figures 6; references 20: 8 Russian, 12 Western. [469-12172]

#### INCORPORATION OF XENOTROPIC MURINE LEUKEMIA VIRUS ANTIGENS ON SURFACE OF MOUSE L CELLS INTO VESICULAR STOMATITIS VIRUS

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 2, Mar 83 (manuscript received 8 Aug 82) pp 105-109

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[Abstract] Radiolabelling and immunoprecipitation were employed in following the appearance of xenotropic murine leukemia virus (XMuLV) proteins on the surface of infected mouse L cells, as well as in rabbit SIRC cells and lamb LKC cells. The surface of the L cells revealed the presence of two XMuLV proteins: major envelope glycoprotein with a molecular weight of 70 kdaltons (70K) and a 90K undissociated precursor protein. Infection of the rabbit and lamb cells resulted in surface appearance of only the 70K protein. L cells subsequently infected with the vesicular stomatitis virus (VSV) showed the incorporation of only the 70K and the 90K proteins into VSV. The incorporation of XMuLV proteins into VSV is apparently responsible for the phenotypic mixing phenomenon involving VSV and unrelated viruses. Figures 5; references 7: 1 Russian, 6 Western. [469-12172]

#### PHENOTYPIC MIXING OF VESICULAR STOMATITIS VIRUS WITH RETROVIRUSES: EFFECTIVE DETECTION METHODS

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 2, Mar 83 (manuscript received 29 Jun 82) pp 110-118

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[Abstract] Two immunological methods were tested for effectiveness in detection of phenotypic mixing involving vesicular stomatitis virus (VSV) grown in rabbit SIRC and mouse L cells infected with xenotropic murine leukemia

virus (XMuLV). Evaluation of the antigenic structure of the resultant VSV viruses showed that the neutralization techniques failed to detect VSV pseudotype formation. However, the immunoprecipitation system involving the use of *Staphylococcus aureus* with protein A showed that almost 100% of the VSV virions produced in the XMuLV-infected SIRC and L cells carried XMuLV antigenic determinants, indicating the formation of VSV pseudotypes. The additional advantage offered by the technique relaying on the use of antibodies against staphylococcal protein A for precipitation is that this may well reveal antibodies against the superficial viral antigens with which the neutralizing antibodies do not react. Figures 5; references 17: 2 Russian, 15 Western.  
[469-12172]

#### TRANSPORT OF ANTIVIRAL AGENT 9-(S)-(2,3-DIHYDROXYPROPYL)ADENINE INTO ANIMAL CELLS

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 2, Mar 83 (manuscript received 16 Jun 82) pp 119-129

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[Abstract2 The facility with which the antiviral agent 9-(S)-(2,3-dihydroxypropyl)adenine (DHPA) is transported into animal cells was investigated in a system employing tritiated DHPA and rabbit cells (ZP), HeLa cells and chick embryo (CE) cells. Evaluation of the kinetics demonstrated that 30-40% of the DHPA was cell bound in 1 min, with maximum levels in the ZP cells approaching 40 pmoles/ $10^6$  cells, in HeLa cells 15-25 pmoles/ $10^6$  cells, and in the CE cells 4-15 pmoles/ $10^6$  cells. The intracellular levels corresponded to 30-50% of the extracellular concentration of DHPA in the medium. In addition, transport of DHPA was virtually unaffected in cells supporting smallpox virus replication in the lag phase. Facilitated diffusion of DHPA was indicated by the facts that it was dependent on the extracellular concentration and temperature ( $Q_{10}$  of ca. 2 at 25-45°C), the presence of a reverse transport mechanism, specific inhibition of DHPA transport by congeners (adenosine, deoxyadenosine), and that at equilibrium the intracellular concentration did not equal the extracellular concentration. The  $V$  and  $K_m$  values ranged from 2 to 17 pmoles/ $10^6$  cells and from 4 to 7  $\mu$ M, respectively. Figures 6; references 14: 3 Russian, 11 Western.  
[469-12172]

REGULATION OF INTERFERON PRODUCTION: SUPERINDUCTION WITH DIHYDRORIFAMPICIN  
IN HUMAN AND CHICK EMBRYONIC FIBROBLASTS AND MOUSE L929 CELLS

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 2, Mar 83 (manuscript received  
16 Dec 81) pp 130-137

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of Virology imeni D. I. Ivanovskiy, USSR Academy of Medical Sciences, Moscow,  
USSR

[Abstract] Superinduction of interferon production was investigated with  
dihydrorifampicin (DHR), employing suspension of human and chick embryo  
fibroblasts and mouse L929 cells induced with polyI:C. The results of  
titrations showed that the fibroblast production of interferon superinduced  
with DHR and cyclohexamide increased 128-fold in comparison with polyI:C alone.  
A significant increase in the production of interferon by the L929 cells was  
also obtained, and was on the order of 40-60-fold greater than seen with the  
inducer alone. Maximum superinduction with DHR was obtained after a 2 h  
exposure to this agent. Another advantage of DHR is its relative lack of  
toxicity which allows for longer interferon production by the cell culture  
than can be obtained with the use of a toxic superinducer such as cyclohexamide.  
Figures 1; references 27: 6 Russian, 21 Western.  
[469-12172]

VACCINIA VIRUS AND POSTVACCINAL ENCEPHALITIS

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 2, Mar 83 (manuscript received  
4 Jan 81; in revised form 26 May 82) pp 154-159

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[Abstract] Virus isolation studies were conducted on 239 specimens obtained  
from 84 pediatric cases with neurologic complications following smallpox  
vaccination. The patients ranged in age from one to nine years, with a  
diagnosis of postvaccinal encephalitis in 31 cases, encephalomyelitis in  
5 cases, serous meningitis in 2 cases, myelitis in one case, myelopathy in  
one case, and 44 cases with encephalopathy complicated by convulsions. Residual  
neurological neurologic sequelae were evident in 7 patients, and 6 patients  
succumbed. The vaccinia virus was isolated from the blood, CSF, throat or  
autopsy materials in 23 of 40 patients with post-vaccinal encephalitis (57.5%)  
within 10-35 days of vaccination. In the acute phase the virus was isolated  
from 17 of the 31 CSF samples (54.2%). In three cases the virus was isolated  
from the brain, and in one case from the spinal cord. These findings indicate  
that the vaccinia virus is an active components of the postvaccinal pathogenesis,  
which presumably occurs against a background of altered or compromised immune  
status. Similar complications, it appears, can also be expected with the  
use of other live viral vaccines. References 16: 5 Russian, 11 Western.  
[469-12172]

CHEMICAL INFLUENZA VACCINE AND "VACCIGRIPP" PREPARATION USED SIMULTANEOUSLY WITH BCG

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 2, Mar 83 (manuscript received 4 Nov 81; in revised form 12 May 82) pp 160-167

ZYKOV, M. P., SUBBOTINA, T. I., RUDENKO, L. G. and KAPLAN\*, N. N., All-Union Scientific Research Institute of Influenza, USSR Ministry of Health, Leningrad; \*Leningrad Pediatric Medical Institute, RSFSR Ministry of Health, Leningrad, USSR

[Abstract] Guinea pigs and rabbits were employed in an evaluation of the simultaneous vaccination with influenza vaccines and BCG, administered separately or as one injection by mixing in a syringe prior to injection. The results demonstrated that the reactogenic properties of the vaccines were not affected, and that BCG had no inhibitory effects on the production of anti-influenza antibodies. However, antitubercular antibodies were enhanced by such schedules of combined immunization, and all the schedules were effective in yielding protection against a challenge with virulent mycobacteria. Comparison with the immunologic responsiveness and localized reactions showed that the Soviet monovalent influenza vaccine adsorbed to a chemical substrate was more effective and less reactogenic than the French bivalent "Vaccigripp" [sic] preparation. References 15: 9 Russian, 6 Western.  
[469-12172]

ULTRASTRUCTURAL COMPARISON OF FINE DENSE FORMS OF CHLAMYDIA AND COXIELLA BURNETII

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 2, Mar 83 (manuscript received 21 May 82) pp 168-172

AVAKYAN, A. A., POPOV, V. L., CHEBANOV, S. M., SHATKIN, A. A., SIDOROV, V. Ye. and KUDELINA, R. I. (deceased), Institute of Epidemiology and Microbiology imeni N. F. Gamaleya, USSR Academy of Medical Sciences, Moscow, USSR

[Abstract] Ultrastructural studies revealed that passage of Coxiella burnetii in the tick Alveonassus lahorensis resulted in the appearance of small dense forms of the microorganism in the hemocytes. These small particles consisted of a dense cytoplasm, lamellar intracytoplasmic membranes and a distinct limiting membrane 25-30 nm thick. Similar forms of C. burnetii were observed in the yolk sac of chick embryos infected with this entity. Such similar dense forms (elementary bodies) surrounded by a complex of membranes have been observed in the case of a number of chlamydial strains cultured in yolk sacs, and bear a resemblance to rickettsial structures. Figures 6; references 15: 7 Russian, 8 Western.  
[469-12172]

#### STRUCTURAL PROTEINS OF FIXED RABIES VIRUS FROM SUCKLING MICE BRAINS

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 2, Mar 83 (manuscript received 14 Jul 82) pp 173-176

ARAI, Y. T., Department of Virology and Rickettsiology, National Institute of Health, Tokyo, Japan

[Abstract] Polyacrylamide gel electrophoresis was employed in an analysis of the structural proteins of strain CVC rabies virus passed in mice and isolated from the brains of suckling mice. The rabies virus fixed in this manner had far less G protein than L, N and M<sub>1</sub> proteins; considerably more G protein was present in the virus cultured in chick embryo fibroblasts. These observations indicate that the predominant viral antigens formed in the mouse brain were the L, N and M<sub>1</sub> proteins of the nucleocapsid complex. An alternative explanation is that virions with a small quantity of G proteins, or lacking the G protein entirely, are capable of multiplications in the mouse brain and of infecting such murine tissue. Figures 4; references 11: (Western). [469-12172]

#### ELECTROIMMUNODIFFUSION FOR ANTIGENIC ANALYSIS OF OVINE AND CAPRINE POX VIRUSES

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 2, Mar 83 (manuscript received 8 Aug 82) pp 177-179

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[Abstract] Conditions are described for electroimmunodiffusion analysis of the antigenic structure of ovine and caprine pox viruses. In homologous antigen-antibody systems seven and five precipitation peaks were obtained for the ovine and caprine systems, respectively, using rabbit antisera. Cross-reaction determinations revealed that the ovine and caprine viruses share three common antigenic determinants. Figure 1; references 10: (Western). [469-12172]

#### STABILITY OF TICK-BORNE ENCEPHALITIS VIRUS SKALICA STRAIN MARKERS DURING MULTIPLICATION IN IXODES RICINUS TICK

Bratislava ACTA VIROLOGICA in Russian Vol 27, No 2, Mar 83 (manuscript received 16 Jun 82) pp 180-182

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[Abstract] Ixodes ricinus larvae were permitted to feed on suckling mice infected with the Skalica strain of the tick-borne encephalitis virus to

study the stability of Skalica markers. Skalica viruses isolated from late nymphs 39 and 54 days after metamorphosis possessed  $ic^+$ ,  $sc^-$ ,  $t^-$  and  $v^-$  markers identical with those shown by the original Skalica isolates. In addition, the demonstration that the nymphs could reinfect albino mice suggests that Skalica may circulate in nature. References 8: 1 Czech, 3 Russian, 4 Western.  
[469-12172]



## MISCELLANEOUS

### INTERVIEW WITH GENERAL KNUNYANTS

Moscow KRSNAYA ZVEDA in Russian 24 Mar 84 p 2

[Interview by KRSNAYA ZVEZDA correspondent A. Garavskiy with General I. L. Knunyants]

[Text] Today, Azimut's guest is organic chemist Academician General-Major-Engineer Ivan Lyudvigovich Knunyants. Among his students are academicians, corresponding members, and professors. The motherland has placed a high value on this scientist's labor. Ivan Lyudvigovich is a Hero of Socialist Labor and laureate of the Lenin Prize and three USSR State Prizes.

Our correspondent, Lieutenant-Colonel A. Garavskiy, talks with General-Major-Engineer I. Knunyants about choosing a career, loyalty to one's calling, and the qualities necessary in creative work.

[Question] Ivan Lyudvigovich, you have given more than half a century to scientific work. What determined your choice of a way of life, a profession?

[Answer] Bad luck...It is true that now, decades later, I am very satisfied with this. But here's the way it was. I very much wanted to become an electrical engineer and, naturally, in applying to the Moscow Higher Technical School imeni Bauman, I indicated this specialty. Whereas now we say that we are living in the atomic or the space age, the twenties was the era of electricity. Not for nothing did Lenin call the GOELRO [State Commission for the Electrification of Russia] plan the party's second program. And I was deeply upset when they told me in the reception room of the commission that because of my age (I was then not yet 17), they could accept me only into the chemistry department. That is how I unwillingly became a chemist.

[Question] And if you could, as the song says, start all over again?...

[Answer] I can answer you perfectly with words from the same song--I would choose again the endless labor of the chemist. With me, you see, it happened just like in another popular song: The reason for first love is so that the second becomes the real one. I am not about to judge how true this is in the realm of feelings, but in the choice of careers my "second love" came to be all-absorbing, a life-long affair. And for this I thank especially my instructor, Professor (subsequently Academician) A. Ye. Chichibabin, who headed the organic chemistry department of Moscow Higher Technical School. Incidentally, he kept me there as a graduate student, and then as an assistant.

[Question] In talking with the audience of the Military Academy of Chemical Defense, you said that you have been lucky in your teachers. Now your students are saying the same about you. What, in your view, is the duty of the teacher, the mentor of students?

[Answer] To my colleagues I often repeat these words: teach your student so that you can subsequently learn from him. And this duty is fulfilled when you are no longer necessary to your students in the scientific scheme.

[Question] At the age of 33 you became a doctor of sciences, and at 34, a professor. Was this exceptional or just the usual procedure?

[Answer] Landau, who became an academician at age 38, said this: our country is young and its scientists are young. Indeed, the Land of October has thrown wide the doors for young people in science and creativity. The quite young Yakovlev designed and constructed an airplane which established two world records. Senior Sergeant Kalashnikov created a well-known automatic which started an entire family of small arms. But there are also many examples where people have come to the laboratory or design bureau at a mature age and done fruitful work. But I am in favor of introducing creativity, research, and design as early as possible. Young people then have more time to prove themselves and their capabilities. And it is better to begin even in the VUZ, in its science classes.

[Question] Ivan Lyudvigovich, you made an unsuccessful attempt to synthesize quinine. This happened at the beginning of your scientific endeavors. How did you get over the failure?

[Answer] Nobody is insured against failures, you know, and in science, a negative result is still a result. As for me, I suffered keenly at that time. I suffered, and...I worked and worked some more. I never did manage to synthesize quinine, although, as it turned out later, I was on the right track. But after several years I produced the effective anti-malaria compound acrichin [quinacrine hydrochloride], which helped save thousands of people from malaria. Then I began studying the chemistry of lactones. Based on one of them, vitamin B<sub>1</sub> was later made. Would that all of my failures led to such results!..

[Question] Let's elaborate for our readers: Knunyants's lactone was the name under which it came into scientific use. You are also well known as the author of several hundred scientific works, inventions, and discoveries, and you are the editor of a scientific journal and chemical encyclopedia. Naturally, every minute of your time is accounted for. Nevertheless, I venture to ask about your hobbies.

[Answer] Paintings. They're the only thing I make time for. I love pictures and even restore some of them myself. And somehow I was persuaded to pose for the artist Shilov, whom I have known for many years.

[Question] As an art lover, you recently wrote: truth and beauty always go hand-in-hand. What goes in hand with the work of a scientist?

[Answer] The service of science. An obsession with it. Purposefulness. Self-sacrifice. Independent thought. And that same truth and beauty. Science makes a man a specialist, while culture, art, and literature make a well-rounded person.

[Question] In your life of nearly eight decades, you have met scientists, cultural figures, military commanders, officers, and workers. What do you value most in a person?

[Answer] Being prepared to take responsibility on oneself on the job. Integrity. Willingness to oblige. Loyalty to the cause one serves. My former student, Academician Fokin, was once accidentally injured working in the laboratory. After several hours I found him in the hospital, in convulsions. With great difficulty they managed to save him. And two weeks later, he was back in the very same laboratory carrying on the very same work. That is the character of a true scientist.

[Question] It is well known that you were the first to create caprone. Our readers would be interested in hearing how this happened.

[Answer] I remember the time when our collective was asked to work on improving Anid (nylon-66). I thought about it for more than a week and finally came back with: "A caprolactam polymer has to be made.: This suggestion, to put it mildly, was received with confusion. After all, Carruthers, the world authority on these matters, considered the polymerization of caprolactam impossible. But I stood by my own opinion. And my persistence, as time proved, was justified.

[Question] It was for developing and creating caprone that you were awarded your most recent USSR State Prize. For what did you receive the first one? That one, if I remember correctly, came during the war.

[Answer] The official document says: "For developing a new medical compound." At that time, 1943, these words could not be amplified for reasons of security. Because the "compound" was nothing else but an antidote for hydrocyanic acid. Our collective succeeded in developing a neutralizer for this toxic substance. The field packs of Soviet fighters soon contained ampules of the new compound.

[Question] At the beginning of our talk, you said that creativity should be introduced during the student years, particularly in science studies. What advice do you have for those who plan to spend their lives in science?

[Answer] Study, work, and search. Search diligently, pursuing everything to the end, leaving nothing unclear or unexplained. A deep understanding of small details gives birth to something which is great and new. It is like this everywhere--in science and in life, employment. Respect learning and authority, but do not worship them. The modern scientist and specialist must certainly be able to use foreign languages. I myself, knowing German and French, deeply regret that I can use English only with difficulty. What else do I want for the young? A healthy ambition. Honesty and integrity. You mustn't be afraid to set yourselves high goals, high tasks. And the most important thing is to work so as to bring the maximum benefit to the socialist motherland, and your people.

CHANGE OF HEAT RESISTANCE OF MUSCLE TISSUE AND OF ORGANISM OF *CHONDROS BIDENS* MOLLUSCS IN RESPONSE TO ENVIRONMENTAL FLUCTUATIONS OF TEMPERATURE

Leningrad TSITOLOGIYA in Russian No 1, Jan 84 (manuscript received 8 Apr 83)  
pp 69-74

DZHAMUSOVA, T. A., KESALMANLY, N. V. and LAVRENT'YEVA, Ye. V., Institute of Cytology, USSR Academy of Sciences, Leningrad

[Abstract] An isolated population of the terrestrial mollusc *Chondrus bidens* (Kryn.) with pronounced shell pattern polymorphism was used in a study of heat resistance of muscle tissue and of the whole organism during fluctuations of environmental temperature and humidity. Heat resistance of muscles and of the whole organism, in each group of molluscs differing in shell pattern, remained at the same level in cold weather with slight (from 7 to 10°C) temperature fluctuations. Under these conditions there was a negative correlation between the mean heat resistance of the individuals (average for the group) on one hand and the heat resistance of the muscle tissue on the other hand. During significant temperature increase (from 7 to 30°C), heat resistance of the organism and that of the muscles in each group increase in parallel and adequately in terms of the environmental temperature change. Increase of the heat resistance of the organisms is accompanied by reduction of the intragroup and population variability according to signs of their heat resistance which is assumed to be phenotypical masking of genotypical differences between individuals, i.e., one of the manifestations of physiological homeostasis of the population. These changes of heat resistance may be a process leading to reduction of the effectiveness of heat removal in case of overheating of the animals and thus promoting preservation of the genetic structure of the population. Figures 2; references 13: (Russian).  
[1018-2791]

AGGREGATION OF THICK PROTOFIBRILS IN MOLLUSC AND INSECT MUSCLES

Leningrad TSITOLOGIYA in Russian No 1, Jan 84 (manuscript received 15 Feb 83)  
pp 109-111

KRYUKOVA, M. Ye. and BOCHAROVA-MESSNER, O. M., Institute of Evolutionary  
Morphology and Ecology of Animals, USSR Academy of Sciences, Moscow

[Abstract] Atypical thick protofibrils were found in the smooth adductor of *Cyprina islandica*, in the obliquely striated adductors of *Serripes groenlandicus* and *Modiolus modiolus* (Bivalvia) and in the longitudinal spinal muscle of the domestic cricket nymph *Acheta domestica* in a long-range study of the ultra-structure of muscles of molluscs and insects. The atypical structures are described and discussed. These atypical protofibrils are formed as a result of fusion of two or more protofibrils of ordinary thickness. References 8: 3 Russian, 5 Western.  
[1018-2791]

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LIP PRINTS AS AN OBJECT OF COMPLEX EXPERT INVESTIGATION IN ATTEMPTS TO  
IDENTIFY A PERSON

Moscow SUDEBNO-MEDITSINSKAYA EKSPERTIZA in Russian No 3, Jul-Sep 83  
(manuscript received 24 Feb 83) pp 21-23

KISIN, M. V. and CHANTURIYA, A. V., All-Union Scientific Research Institute  
(director-Professor I. I. Karpets), USSR Ministry of Internal Affairs, Moscow

[Abstract] Study of lip prints from 1225 cadavers and 106 living persons showed that valuable forensic data may be obtained by analyzing the morphological specificity of lip marginal fold contours, ABO antigen testing and sex determination of epithelial cells obtained from lip prints. The study showed that the central section of the lower lip provides most significant signs for use in identifying a person since it is most frequently found on objects during investigations and since it is the zone in which special distinguishing marks, microquantities of saliva and epithelial cells are found most frequently.  
[450-2791]

MAGNETISM IN MEDICINE

Moscow SOVETSKAYA KUL'TURA in Russian 24 Mar 84 p 3

SHVARTS, V.

[Abstract] Current status of magnetotherapy in the USSR and a review of the biological effects of magnetic forces were the topic of an interview with

Anatoliy M. Demetskiy, chair of the Magnetotherapy and Magnetobiology Commission of the USSR Ministry of Health. Although the therapeutic effects of magnets were appreciated long ago in antiquity, current advances have refined their use and have defined the therapeutic potential of magnetic forces in the management of pain, acceleration of wound healing and scar tissue formation, control of hypertension, regulation of blood coagulation, and in the reduction of edema, among other things. More recent times have seen the development of the field of magnetopharmacology. This aspect of research concerns not only the effects of magnetic lines of flux on drug effects and pharmacokinetics, but also on the use of magnetized drug delivery vehicles (microcapsules) for intravascular delivery of drugs to desired sites under magnetic control.

[517-12172]

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